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International Migration, Relative Deprivation and Cultural Similarity

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Abstract

We investigate the relationship between international migration and the feeling of relative deprivation using macro-level data on migration flows among a large number of countries. Besides providing a test for relative deprivation as both a push and pull factor, our novel contribution lies in explicitly considering the fact that relative deprivation is felt more intensely with regards to culturally similar individuals. Hence, if on the one hand low-income migrants who feel relatively deprived in their origin country are more likely to move to a country where wages are higher, on the other hand the same migrants have an incentive to migrate to culturally dissimilar countries as this helps to feel less intensely deprived.

JEL classification code: F22, J61, O15.

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1 Introduction

In this paper we investigate the relationship between the phenomenon of international migration and one of its potential causes: the feeling of relative deprivation. Relative deprivation is a kind of upward social comparison. An individual feels relatively deprived when other individuals with whom he compares command a higher income. The greater the income gap, the greater the feeling of deprivation.

In the literature relative deprivation is understood as a push factor of migration, as the bad feelings linked to deprivation increase the (psychological) costs of not migrating (Stark and Taylor, 1989). However, as migrants relocate to the destination country, they may start to compare more with individuals in the destination country and less with individuals from their origin country. In other words, migrants could replace, maybe partially, their reference group once relocated. As it as been pointed out by Stark and Taylor (1991), this process of reference group substitution can be reasonably expected to be more likely when the origin and the destination country are more culturally similar.

Our contribution lies in explicitly considering the fact that relative deprivation is felt more intensely with regards to culturally similar individuals. To the extent that one's origin country is culturally close to one's culture, it remains true that relative deprivation may be a push factor, since deprivation is fully felt by individuals who remain in theirs origin country. However, the same deprived individuals have an incentive to migrate to culturally dissimilar countries as this helps to feel less intensely deprived.

We firstly provide a simple model with the twofold aim of clarifying the mechanism described above and of providing guidance for the empirical analysis. Secondly, we empirically investigate the joint role of relative deprivation and cultural similarity using macro-level data on migration flows among a large number of countries.

2 Related literature

2.1 Standard pull and push factors

The determinants and consequences of migratory movements have long been discussed in the economic literature. The first contributions can be found in neoclassical economics, which stress differentials in wages as a primary determinant of migration (Hicks, 1932). The "human capital investment" theoretical framework (Sjaastad, 1962) adds migration costs to the model of migration, so that a person decides to move to another country only if the discounted expected future benefit of moving is higher than the cost of migration. The

"human capital investment" model has been further adjusted by including the probability of being employed in each location; see Harris and Todaro (1970). In aggregate terms, the differentials in wages and probability of unemployment are typically proxied by GDP per capita levels and unemployment rates in destination and source countries, respectively. The effect of GDP per capita in the source country on migration flows may be mixed since poverty constrains the ability to cover costs of migration. It has been shown in previous studies, e.g. Chicquar and Hanson (2005), Hatton and Williamson (2005), Clark, Hatton and Williamson (2007), Pedersen et al. (2008) and Vogler and Rotte (2000), that source country's GDP per capita has an inverted U-shape effect on migration.

In addition to the economic determinants, Borjas (1999) argues that generous social security payment structures may play a role in migrants' decision making. The idea behind this is that potential emigrants must take into account the probability of being unemployed in the destination country. The damaging consequences of unemployment may be reduced with the existence of generous welfare benefits in the destination country. Such welfare transfers constitute basically a substitute for earnings during the period devoted to searching for a job. However, empirical studies are not conclusive in this respect; see e.g. Zavodny (1997), Pedersen et al. (2008), Giulietti et al. (2011), Wadensjö (2007), among others. Besides, immigration policies and changes in these policies over time strongly contribute to shape migration flows as their impact among individuals from different source countries for each potential receiving country may differ (Clark et al. 2007; Mayda, 2010; Ortega and Peri 2009). The costs of migration are also an important part of migrants' decision making. They include not only the immediate out-of-pocket expenses, but also psychological costs connected to moving to a foreign country and leaving behind family, friends and a familiar environment. Costs typically increase with the physical distance between two countries. However, changes and improvements in communication technologies and declining transportation prices may have reduced the relevance of physical "distance" during the latest decades. Further, network effects may also counteract the deterrent effect of "distance". Through "networks" potential migrants receive information about the immigration country - about the likelihood of getting a job, economic and social systems, immigration policy, people and culture. This facilitates the move and the adaptation of new immigrants into the new environment (Massey et al. 1993; Munshi, 2003). Many immigrants may even spend their whole lives working in an ethnic enclave within their destination location (i.e. Boyd 2010 for the case of Canada). That community may also be more ready to receive a newcomer and his/her family with regard to public services, language training and children's education. Network effects may also help to explain the persistence of migration flows; see e.g. Bauer et al. (2005, 2007), Heitmueller

(2006) and Clark et al. (2007). Empirical evidence has shown that migrant networks have a significant impact on sequential migration, see e.g. Pedersen et al. (2008), who also show that networks are more important to people coming from low-income developing countries compared to migrants originating from high-income countries. The latter is also supported by McKenzie and Rapoport (2010) and Beine et al. (2011) who find that diasporas explain a majority of the variability and selection in migration flows.

2.2 Culture

The linguistic and cultural distance between source and destination country is as well important. The more "foreign" or distant the new culture and the larger the language barriers are, the higher are the migration costs for an individual and the less likely is he or she to migrate to that destination, holding all other factors constant (Pedersen et al., 2008). A recent study by Belot and Ederveen (2010) shows that cultural barriers, as measured by a diverse set of cultural, religious and linguistic distance indexes based on Hofstede (1991), Baker and Inglehart (1991) and Dyen et al. (1992), explain patterns of migration flows between developed countries better than traditional economic variables. Another factor reported in recent studies to influence migration flows is the destination's country migration policy (Clark et al., 2007; Ortega and Peri, 2009; Mayda, 2010). Finally, conflicts and political pressures have played a role in driving international migration (Pedersen, Pytlikova and Smith, 2008; Adsera and Pytlikova, 2012; Hatton and Williamson, 2011), and particularly so for refugees (Hatton and Williamson, 2003; Naudé, 2010).

2.3 Relative deprivation

The relative deprivation hypothesis is formalized by the assumption that the utility of a potential migrant who decides to remain in the origin country depends negatively on the income of individuals with higher income (Stark and Yitzhaki, 1988). The basic idea of relative deprivation as a push factor is that people and households migrate not only to improve income in absolute terms, but also to increase income relative to other households. Relative deprivation in origin countries has been found to be one of the main migration motives (Stark 1984; Stark and Taylor, 1989; Stark and Taylor 1991). Recent micro-level empirical evidence is also consistent with the relative deprivation hypothesis (Bhandari, 2004; Quinn 2006; Stark et al., 2009).

Stark and Taylor (1991) note that the relationship between relative deprivation and migration decision crucially hinges the persistence of the reference group, that is, the stability

of the group of people one's compare with. If migrants continue mostly compare themselves with individuals in the origin country, then relative deprivation is not going to be felt with respect to individuals in the destination country. This can explain why migrants are willing to accept humiliating jobs in the destination country, while they would not accept such jobs in the origin country (Stark and Fan, 2011a, 2011b).

Stark and Taylor (1991) also suggest that the reference group is quite persistent, although the actual identity of the reference group depends on cultural similarity. This means that migrants who go to a culturally similar country are more likely to compare themselves with individuals in the destination country, and hence to feel relatively deprived with respect to them. In this paper we follow exactly this intuition assuming that the reference group of a migrant is more likely to be in the destination country if it is culturally similarity to origin country.

Czaika and de Haas (2012) empirically investigate the impact of within-country and between-countries relative deprivation. Their estimates suggest that both the between-country relative deprivation and the relative deprivation in destination country fuel migration, while the effect of relative deprivation in origin country is small and rather ambiguous. Czaika and de Haas (2012) suggest that we should not expect that a decrease in relative deprivation should lead to massive reductions in the volume of international migration. However, this study does not take into consideration cultural similarity.

3 Model 1: Relative deprivation towards origin population only

We consider simple model of migration decision where individuals face different income opportunities depending on country and skills, and where they can feel relatively deprived with respect to the income levels in their origin country.

There are two countries: the "origin" country which we denote with 0 and the "destination" country which we denote with 1. There are two types of individuals in each country: skilled and unskilled. Population is normalized to 1 in both countries. We denote with α^0 the fraction of skilled individuals in the country of origin, and with α^1 the fraction of skilled individuals in the country of destination. Further, we denote with y_u^0 the income of an unskilled individual in the origin country, and with y_u^1 the income of an unskilled individual in the destination country. Similarly, we denote with y_s^0 the income of a skilled individual in the destination country, with y_s^1 the income of a skilled individual in the destination country.

We assume that $y_s^0 > y_u^0$ and that $y_s^1 > y_u^1$, meaning that being skilled pays more that being unskilled in both countries. Incomes are earned only depending on type and location. Individuals obtain utility $U(y)$ from income y, with $U' > 0$, $U'' < 0$.

We consider individuals initially set in country 0 that have to decide whether to stay and work in 0 or migrate to country 1. The cost of migrating from 0 to 1 is c. Besides income and migration costs, individuals can feel relatively deprived. The relative deprivation of individual $i \in \{u, s\}$ born in country 0 and working in country $j \in \{0, 1\}$ is defined as $RD_i^{0,j} = \max\{0, \alpha^0(y_s^0 - y_i^j)\}$. Individuals suffer a loss of utility due to relative deprivation which is equal to $V(RD)$, with $V' > 0$ and $V'' > 0$.

To keep the model as simple as possible, we assume that $y_s^0 < y_s^1$ and $y_u^0 < y_u^1$. Note that the first inequality implies that $RD_s^{0,0} = RD_s^{0,1} = 0$ as skilled individual are not deprived in country 0 and cannot become deprived by migrating to country 1. So, relative deprivation can only be felt by unskilled individuals: the relative deprivation felt by individuals born in country 0 who stay in country 0 is $RD^{0,0} = (y_s^0 - y_u^0)\alpha^0$, while the relative deprivation felt by individuals born in country 0 who migrate to country 1 is $\overline{RD}^{0,1} = (y_s^0 - y_u^1)\alpha^0$.

Skilled individuals who stay in country 0 get $U(y_s^0)$ while skilled individuals who stay in country 1 get $U(y_s^1)$. Hence, skilled individuals decide to migrate from 0 to 1 if:

$$U(y_s^1) - U(y_s^0) - c + \epsilon_s^1 > 0 \; . \tag{1}$$

where ϵ_s^1 is an idiosincatic shock with zero mean which is (normally distributed?) specific to skilled individuals in country 1 and is not income-related (so that it does not affect U or V).

Unskilled individuals who stay in country 0 get $U(y_u^0) - V(RD_u^{0,0})$ while skilled individuals who stay in country 1 get $U(y_u^1) - V(RD_u^{0,1})$. Hence, unskilled individuals decide to migrate from 0 to 1 if:

$$\begin{aligned} &U(y_u^1) - U(y_u^0) - c - V(RD_u^{0,1}) + V(RD_u^{0,0}) + \epsilon_u^1 = \\ &= U(y_u^1) - U(y_u^0) - c - \underbrace{\left(V(\alpha^0(y_s^0 - y_u^1)) - V(\alpha^0(y_s^0 - y_u^0))\right)}_{\Delta V<0\text{: smaller deprivation if relocate to 1}} + \epsilon_u^1 \; . > 0 \end{aligned} \tag{2}$$

where ϵ_u^0 is again an idiosincatic shock with zero mean which is (normally distributed?) specific to unskilled individuals in country 1 and is not income-related.

Straightforward comparative statics shows the following effects, which are summarized in Table 1. First, a greater y_s^0 increases migration of the unskilled and decreases migration of the skilled. Note that the increase in migration of the unskilled crucially hinges on the increase of relative deprivation that they feel if they stay in country 0. Second, a greater y_u^0 decreases

	effect on relative deprivation		**effect on migration**		
			direct	through relative deprivation	
$\Delta > 0$	$\Delta RD^{0,0}$	$\Delta RD^{0,1}$		$RD^{0,0}$	$RD^{0,1}$
y_s^0	$+$	$+$	$-$	$+$	$+$
y_u^0	$-$	0	$-$	$-$	0
y_s^1	0	0	$+$	0	0
y_u^1	0	$-$	$+$	0	$+$

Table 1: Effects of an increase in incomes for relative deprivation and migration from country 0 to country 1. Symbol "+" means a positive change, "−" means a negative change, 0 means no change.

migration of the unskilled. This effect is reinforced by the decrease of relative deprivation felt by the unskilled who stay in country 0. Third, a greater y_s^1 increases migration of the skilled. We observe that it also increases the relative deprivation felt by the unskilled born in country 1, but this does not affect migration since people born in country 0 (and in particular the unskilled) do not care about the income of people born in country 1. Fourth, a greater y_u^1 increases migration of the unskilled. This effect is reinforced by relative deprivation since the unskilled born in 0 can decrease more their feeling of relative deprivation by migrating to 1.

4 Model 2: Relative deprivation mediated by culture

In this section we modify the model presented in the previous section to allow for feelings of relative deprivation which are mediated by culture. In particular, we consider the possibility that migrants can switch their social comparison towards people from the destination country, and that migrants do this more intensely if the destination country is more culturally similar to their origin country. To this aim, we modify the model of migration decision described in the previous section as follows.

Individuals migrating from country 0 to country 1 can feel relatively deprived towards both a reference group in country 0 and a reference group in country 1. Naturally, if the migrant remains in country 0, then relative deprivation is felt fully and only towards the reference group in country 0. However, if the migrant relocates to country 1, then relative deprivation is felt partially towards the reference group in country 1, with weight γ, and partially towards the reference group in country 0, with weight $1 - \gamma$. The parameter γ

measures the degree of cultural similarity between country 1 and country 0, meaning that a greater cultural similarity between 0 and 1 makes the migrant from 0 to 1 attach a greater relevance to the reference group in country 1 and less relevance to the reference group in country 0..

The relative deprivation of individual $i \in \{u, s\}$ born in country 0 and working in country 0 is still $RD_i^{0,0} = \max\{0, \alpha^0(y_s^0 - y_i^0)\}$, but the relative deprivation of individual $i \in \{u, s\}$ born in country 0 and working in country 1 is now $(1-\gamma)RD_i^{0,1} + \gamma RD_i^{1,1}$, where $RD_i^{0,1} = \max\{0, \alpha^0(y_s^0 - y_i^1)\}$ and $RD_i^{1,1} = \max\{0, \alpha^1(y_s^1 - y_i^1)\}$. So, individual $i \in \{u, s\}$ suffers a loss of utility due to relative deprivation which is equal to $V(RD_i^{0,0})$ if she remains in 0 and equal to $V\left((1-\gamma)RD_u^{0,1} + \gamma RD_u^{1,1}\right)$ if she migrates to 1.

We note that, since $y_s^0 < y_s^1$, $RD_s^{0,0} = RD_s^{0,1} = RD_s^1 = 0$ as a skilled individual who stays in country 0 or relocates to country 1 never has her income surpassed by someone else. So, again relative deprivation can only be felt by unskilled individuals: the relative deprivation felt by individuals born in country 0 who stay in country 0 is, as in the model of the previous section, $RD^{0,0} = \alpha^0(y_s^0 - y_u^0)$, while the relative deprivation felt by individuals born in country 0 who migrate to country 1 is now $(1-\gamma)RD_u^{0,1} + \gamma RD_u^{1,1} = (1-\gamma)\alpha^0(y_s^0 - y_u^1) + \gamma\alpha^1(y_s^1 - y_u^1)$, with the relative weight γ being given by cultural similarity between 0 and 1. We also assume that $\alpha_0 \leq \alpha^1$, so that $RD^{1,1} > RD^{0,1}$.

It is easy to see that the migration decision of skilled individuals follows what described in the previous section. Instead, for unskilled individuals things change. In particular, an unskilled individual born in country 0 who remains in country 0 gets $U(y_u^0) - V(RD_u^{0,0})$, while if she migrates to country 1 then she gets $U(y_u^1) - V\left((1-\gamma)RD_u^{0,1} + \gamma RD_u^{1,1}\right)$. Therefore, unskilled individuals decide to migrate from 0 to 1 if:

$$U(y_u^1) - U(y_u^0) - c - V\left((1-\gamma)RD_u^{0,1} + \gamma RD_u^{1,1}\right) + V(RD_u^{0,0}) + \epsilon_u^1 =$$
$$U(y_u^1) - U(y_u^0) - c + \underbrace{V(\alpha^0(y_s^0 - y_u^0) - V\left((1-\gamma)\alpha^0(y_s^0 - y_u^1) + \gamma\alpha^1(y_s^1 - y_u^1)\right)}_{\Delta V\text{: change in deprivation if relocates to 1 depends on } \gamma} + \epsilon_u^1 > 0\,. \quad (3)$$

where ϵ_u^0 is an idiosincatic shock with zero mean which is (normally distributed?) specific to unskilled individuals in country 1 and is not income-related (so that it does not affect U or V).

Turning attention to comparative statics, we see that we have all effects described for Model 1 plus a few new effects. We summarize all effects for Model 2 in Table 2. The new effects go through the channel of $(1-\gamma)RD^{0,1} + \gamma RD^{1,1}$ (see last column of Table 2). Both a greater y_s^0 and a greater y_u^1 have the same positive impact on migration through

	effect on relative deprivation			**effect on migration**		
				direct	through relative deprivation	
$\Delta > 0$	$\Delta RD^{0,0}$	$\Delta RD^{0,1}$	$\Delta RD^{1,1}$		$RD^{0,0}$	$(1-\gamma)RD^{0,1} + \gamma RD^{1,1}$
y_s^0	$+$	$+$	0	$-$	$+$	$+$
y_u^0	$-$	0	0	$-$	$-$	0
y_s^1	0	0	$+$	$+$	0	$-$
y_u^1	0	$-$	$-$	$+$	0	$+$
γ	0	0	0	0	0	$-$

Table 2: Effects of an increase in incomes for relative deprivation and migration from country 0 to country 1, when relative deprivation mediated by culture. Symbol "+" means a positive change, "−" means a negative change, 0 means no change.

relative deprivation. However, a greater y_s^0 has an effect on migration which is increasing in γ since comparison with the reference group in 0 decreases in γ. Instead, a greater y_u^0 has a positive effect of a size that depends on $\gamma\alpha^1 - (1-\gamma)\alpha^0$, and therefore can both increase or decrease in γ. Further, there are two completely new effects. The first is that a greater y_s^1 decreases migration through relative deprivation because now migrants also compare with skilled individuals in the destination country. Note that this negative effect increases in γ in absolute value. Second, an increase in γ decreases migration through relative deprivation, since $RD^{1,1} > RD^{0,1}$.

5 Empirical specification

In Model 1 average relative deprivation in country 0 felt by individuals born in country 0 can be rewritten as:

$$\overline{RD}^0 = \bar{y}^0 \frac{(y_s^0 - y_u^0)}{\bar{y}^0} \alpha^0(1-\alpha^0) = \underbrace{(\alpha^0 y_s^0 + (1-\alpha^0) y_u^0)}_{\text{average income of country 0}} \underbrace{(\delta_s^0 - \delta_u^0)\alpha^0(1-\alpha^0)}_{\text{GINI of country 0}} \tag{4}$$

where δ_s^0 and δ_u^0 are, respectively, the percentage of income that skilled and unskilled individuals earn, respectively, with respect to average income.

So, a simple specification of Model 1 is:

$$\ln\left(\frac{flow_{0,1}}{pop_0}\right) = \underbrace{\beta_{\mathbf{x}} X + \beta_1 \ln\left(\frac{\mu_0}{\mu_1}\right)}_{\text{stnd push/pull}} + \underbrace{\beta_2 \mu_0 \Gamma_0 + \beta_3 (\mu_0 \Gamma_0)^2}_{\text{RD origin}} + u \tag{5}$$

where $flow_{0,1}$ is the flow of migrants from country 0 to country 1, pop_0 is population in country 0, X is matrix of controls, μ_0 is GDP per-capita in country 0, μ_1 is GDP per-capita in country 1, Γ_0 is the GINI coefficient of country 0, and u is a random term.

In Model 2 average relative deprivation in country 0 felt by individuals born in country 0 is as in Model 1, while average relative deprivation in country 1 felt by individuals born in country 1 can be rewritten as:

$$\overline{RD}^1 = \underbrace{(\alpha^1 y_s^1 + (1-\alpha^1) y_u^1)}_{\text{average income of country 1}} \underbrace{(\delta_s^1 - \delta_u^1)\alpha^1(1-\alpha^1)}_{\text{GINI of country 1}} \tag{6}$$

where δ_s^1 and δ_u^1 are, respectively, the percentage of income that skilled and unskilled individuals earn, respectively, with respect to average income.

So, a simple specification of Model 2 is:

$$\ln\left(\frac{flow_{0,1}}{pop_0}\right) = \underbrace{\beta_{\mathbf{x}} X + \beta_1 \ln\left(\frac{\mu_0}{\mu_1}\right)}_{\text{stnd push/pull}} + \underbrace{\beta_2 \mu_0 \Gamma_0 + \beta_3 (\mu_0 \Gamma_0)^2}_{\text{RD origin}} + \underbrace{\beta_4 \gamma \mu_1 \Gamma_1 + \beta_5 (\gamma \mu_1 \Gamma_1)^2}_{\text{RD destination}} + u \tag{7}$$

where $flow_{0,1}$ is the flow of migrants from country 0 to country 1, pop_0 is population in country 0, X is matrix of controls, μ_0 is GDP per-capita in country 0, μ_1 is GDP per-capita in country 1, Γ_0 is the GINI coefficient of country 0, Γ_1 is the GINI coefficient of country 1, and u is a random term.

6 Data

6.1 International Migration Flow and Stock Dataset

The dataset on international migration encompasses information on bilateral flows and stocks of immigrants from all world source countries to 42 destination countries from all world countries for the years 1980–2010.[1] The dataset has been collected by writing to selected national

[1]he original OECD migration dataset by Pedersen, Pytlikova and Smith (2008) covered 22 OECD destination and 129 source countries over the period of years 1989-2000 (see Pedersen, Pytlikova and Smith (2008) for a description of the dataset). For the study by Adsera and Pytlikova (2012), we extended the

statistical offices of 27 OECD countries to request detailed information on immigration flows and foreign population stocks by source country in their respective country. For six OECD countries – Chile, Israel, Korea, Mexico, Russian Federation and Turkey - the data comes from the OECD International Migration Database. For nine other destinations – Bulgaria, Croatia, Cyprus, Estonia, Latvia, Lithuania, Malta, Romania and Slovenia – the data is collected from Eurostat. In the Appendix we provide a detailed overview of definitions and sources for data on immigration flows and foreign population stock, respectively. Similarly as other migration databases, the data set is unbalanced, with some missing information on migration flows and stocks for some countries and some years. For an overview of comprehensiveness of observations of flows and stocks for those 42 destination countries over time, see tables in Appendix B.

Besides the information on flows and stocks of migrants and attitudes, the dataset contains a number of other time-series variables, shown to explain international migration in earlier studies, which we include as covariates in our econometric specifications. Most of these variables were collected from the OECD or the World Bank.

6.2 Cultural indicators

The concept of culture is hard to define and there are many different definitions of it. Nonetheless, it is possible to identify some elements on which most authors agree. Culture is first of all something that is referred to a collective: a group, an organization, a country. It is also something that is not innate but that is acquired, passing from generation to generation. Finally, culture is about what is considered by a community as the preferred way of doing things, a shared set of habits, norms and values. Cultural distance across countries can be measured in different ways. On the one hand, there are "objective" measures of cultural distance such as linguistic distance and religious distance; on the other hand, there is a set of measures of cultural distance which have been constructed by different scholars and which mainly refer to norms, values and beliefs.

Linguistic distance. In our analysis the cultural and linguistic distances between countries are crucial for investigating the hypothesis that relative deprivation is experienced more for individuals, who are culturally and linguistically closer. We use two alternative measures

number of destinations to 27 OECD countries and the number of source countries to all world countries, and we extended the time period so that it covers years 1980-2009. The next - third – version of the data, which we use in the current paper, covers 42 destinations, and years 1980-2010, this dataset version is thereafter referred as Pytlikova (2011).

of linguistic distance, Linguistic Proximity index constructed by Adsera and Pytlikova (2012) and Levenstein linguistic distance produced by the Max Planck Institute for Evolutionary Anthropology.[2] The first mentioned linguistic proximity measure is based on information from the encyclopaedia of languages Ethnologue (Lewis, 2009). The Linguistic Proximity index ranges from 0 to 1 depending on how many levels of the linguistic family tree the languages of both the destination and the source country share. The second mentioned, Levenstein linguistic distance relies on phonetic dissimilarity of words in two languages and the continuous index increases with the distance between languages. Linguists choose a core set of the 40 more common words across languages describing everyday life and items; then, express them in a phonetic transcription called ASJP code and finally compute the number of steps needed to move from one word expressed in one language to that same word expressed in the other language. For a detailed description of the method, see Bakker et al. (2009).[3]

Cultural distance. The first comprehensive set of measures of cultural distance across countries was proposed by Hofstede in the 1980s (Hofstede, 1980). He constructed a measure of cultural orientation of countries based originally on four and later on six dimensions. These dimensions are: 1) Power distance (the extent to which differences in power distribution are accepted and expected within in a culture); 2) Uncertainty avoidance (the degree to which people in a culture feel threatened by uncertain and unfamiliar situations); 3) Individualism [versus collectivism] (the degree to which loose rather than tight relationships between individuals exist in a culture); 4) Masculinity [versus femininity] (the degree to which gender roles are or are not strongly emphasized within a culture); 5) Long-term orientation [versus short-term orientation] (the degree to which individuals are able to persevere instead of try to get immediate results); 6) Indulgence [versus restraint] (the degree to which a society allows relatively free gratification instead of suppression of basic and natural human drives related to enjoying life and having fun). The most recent data on the Hofstede's indicators of cultural distance are available for 93 countries and cover a period starting from the 1970s, although not all countries have data for all the reference periods.

The second comprehensive set of measures of cultural distance is that proposed by In-

[2]Linguistic distance is not easy to define and, consequently, there is not a common agreement on how to measure it. The reason for the lack of a yardstick lies both in the complexity of languages (which may differ by many things such as vocabulary, grammar and syntax) and in the fact that the distance among languages may depend on whether they are in the written or spoken form (Chiswick and Miller, 2005).

[3]The Levenshtein index has already been used as a useful tool to measure the extent of difficulty in learning the local language among migrants to Germany (Isphording and Otten 2011).

glehart and Baker (2000). These measures are based on a set of indicators taken from the World Values Surveys (WVS) and the European Values Survey (EVS). From a factor analysis performed on the various waves of the survey, the authors organized the data around two major dimensions: 1) Traditional versus secular-rational values (a dimension which reflects the contrast between societies in which religion is very important and those in which it is not); 2) Survival versus self-expression values (a dimension which emphasizes the contrast between societies where there is emphasis on economic and physical security and those in which there is emphasis on subjective well-being, self-expression and quality of life). Inglehart and Baker's measures are currently available for 102 countries and range from the 1980s till the end of the last decade, although not all countries have data for all the reference periods.

The third comprehensive set of measures of cultural distance across countries is that of Schwartz (1994). Schwartz used samples of students and of elementary school teachers to carry out a research into the existence of universal value orientations: while the initial research was performed in the late 1980s and early 1990s only among teachers and pupils, more recently it has been carried out among larger population groups in Europe (via the European Social Surveys). Schwartz distinguishes seven value types at national culture level: 1) harmony (unity with nature, peace on earth); 3) conservatism (social order, obedience, respect for tradition); 2) hierarchy (authority, deference); 4) mastery (ambition, challenge); 5) affective autonomy (pleasure, an exciting life); 6) intellectual autonomy (broad-minded, curious); 7) egalitarianism (social justice, equality). At present, the available data refer to a sample of 65 countries from the early 1990s. To measure cultural distance, we here use a composite measure taken from the indicators by Inglehart and Baker using all the data available, till the last wave of WVS and EVS. The reason of our choice is that among the indicators listed above, the Inglehart and Baker's dimensions cover the largest set of countries and periods.

To construct our measure of cultural distance we here adopt the same approach as Belot and Ederveen (2012) and compute an indicator of cultural distance between 2 countries (i and j) as follows:

$$DisInglehart_{i,j} = \sqrt{(Dim1_i - Dim1_j)^2 + (Dim2_i - Dim2_j)^2} \tag{8}$$

where $Dim1$ is Inglehart' and Baker's dimension "Traditional versus secular-rational values" and $Dim2$ is Inglehart' and Baker's dimension "Survival versus self-expression values".

6.3 Other control variables

Our remaining control variables are: Populations, GDP per capita, unemployment rates and public social expenditure data from the World Development Indicators published by the World Bank, data on bilateral distance, neighboring dummy (equal to 1 if two countries share a border) and variables of past colonial ties, published by CEPII, and Gini coefficients from various sources.

7 Results

[to be developed]

8 Conclusions

[to be done]

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A Relationship between average Relative Derivation and the GINI coefficient

Let

- $[y_{min}, y^{max}] \subseteq \Re_+$ be the interval of incomes
- $f(y)$ be the density function describing the distribution of incomes
- $F(y) = \int_{y_{min}}^{y} f(s)\mathrm{d}s$ be the cumulative distribution function of incomes
- y_i be income of individual i
- $\mu = \int_{y_{min}}^{y_{max}} yf(y)\mathrm{d}y$ be average income
- Γ be the GINI coefficient

We define relative deprivation of individual i as:

$$RD^i(y) = \int_{y_i}^{y^{max}} (y - y_i)f(y)\mathrm{d}y = \int_{y_i}^{y^{max}} (1 - F(y))\mathrm{d}y \tag{9}$$

The average relative deprivation is given by (Yitzhaki, 1979):

$$\overline{RD} = \int_{y_{min}}^{y^{max}} RD^i(y)f(y)\mathrm{d}y = \mu\Gamma \tag{10}$$

B Data

Stock of Foreign Population: Definitions and Sources

Foreign population stock in:	*Definition of "foreigner" based on*	*Source*
Australia	Country of birth	Census of Population and Housing, Australian Bureau of Statistics
Austria	Country of birth	Statistics Austria, Population Census 2001 and Population Register 2001 to 2009. For census year 1981 and 1991 definition by citizenship
Belgium	Citizenship	Population register. Institut National de Statistique
Bulgaria	Citizenship	Eurostat.
Canada	Country of birth	Census of Canada, Statistics Canada. www.statcan.ca/
Chile	Country of birth	OECD Source International Migration data.
Cyprus	Country of birth	Eurostat.
Czech Rep.	Citizenship	Permanent residence permit and long-term visa, Population register, Czech Statistical Office and Directorate of Alien and Border Police
Denmark	Country of origin	Population register. Danmarks Statistics
Estonia	Country of birth	Eurostat
Finland	Country of birth	Population register. Finish central statistical office
France	Country of birth	Census. Residence permit. Office des migrations internationals.
Germany	Citizenship	Population register. Statistisches Bundesamt
Greece	Citizenship	Labour force survey. National Statistical Service of Greece.
Hungary	Citizenship	National Hungary statistical office
Iceland	Country of birth	Population register. Hagstofa Islands
Ireland	Country of birth	Censuses, Statistical office, Ireland
Israel	Country of birth	OECD Source International Migration data
Italy	Citizenship	Residence Permits. ISTAT
Japan	Citizenship	Years 1980-1999, Register of Foreigners, Ministry of Justice, Office of Immigration. Years 1999-2008 OECD Source Migration stat. Both sources based on permanent and long-term permits.
Korea	Citizenship	1986-1988: Trends in international migration Outlook, OECD 1990-2008: OECD Source International Migration Database
Latvia	Country of birth	Eurostat

Lithuania	Country of birth	Eurostat
Luxembourg	Citizenship	Population register, Statistical office Luxembourg
Malta	Citizenship	Eurostat.
Mexico	Country of birth	2005: Trends in international migration Outlook, OECD 2000: OECD Source International Migration Database
Netherlands	Citizenship	Population register, CBS
New Zealand	Country of birth	Census, Statistics New Zealand
Norway	Country background	Population register, Statistics Norway Country background is the person's own, their mother's or possibly their father's country of birth. Persons without an immigrant background only have Norway (000) as their country background. In cases where the parents have different countries of birth, the mother's country of birth is chosen.
Poland	Country of birth	2002 Census, rest permits, Statistics Poland
Portugal	Citizenship	Residence Permit, Ministry of Interior, www.ine.pt
Romania	Country of birth	Eurostat.
Russian Fed.	Country of birth	OECD Source International Migration data.
Slovak Republic	Country of Origin	Permanent residence permit and long-term visa, Slovak Statistical Office
Slovenia	Country of birth	Eurostat.
Spain	1985-1995 Citizenship 1996-2009 Country of birth	Residence Permit, Ministry of Interior
Sweden	Country of Birth	Population register, Statistics Sweden
Switzerland	Citizenship	Register of Foreigners, Federal Foreign Office
Turkey	Country of birth	OECD Source International Migration Database
United Kingdom	Country of Birth	LFS, UK statistical office
United States	Country of birth	US Census Bureau: 1990 and 2000 US census, the rest Current Population Survey (CPS) December. Data Ferret. Years 1980-1989, 1991-2004 from extrapolations by Tim Hatton (RESTAT)

Country-Year Coverage migration flows

Columns: Destination Countries

Rows: Year

Cell: numbers of source countries, for which we have some observations on number of immigrants for particular year

Dest	AU	AT	BE	BG	CA	CH	CL	CY	CZ	DE	DK	ES	ET	FIN	FR	GB	GR	HR	HU	IRL	ISL	ISR	ITA	JP	KR	LT	LU	LV	ME	ML	NL	NO	NZ	PL	PT	RO	RU	SR	SV	SE	TR	US
Year																																										
2010	208	190			217	198			135	193	203	113	212	183					144	208	179		184			204	141				194	213	212	124	148			212	209	194		197
2009	205	190	184		214	194	140		141	193	203	113	209	183		26			139	209	178	44	188	201	58	205	141	209	128		198	202	212	123	150		197	212	208	192	200	198
2008	204	190	182	207	214	194	140	209	143	194	203	113	208	183	120	21		208	142	208	178	44	187	198	57	204	146	207	126		195	202	213	205	143	75	197	212	207	192	196	196
2007	206	190	93	190	214	194	140	190	147	193	203	113	190	183	124	19	191	190	128	2	178	44	181	197	28	190	142	190	126	190	197	202	213	205	126		197	211	190	192	195	197
2006	206	190	96		214	194	140	190	142	193	202	108	190	183	120	34	190	190	133	2	178	44	182	195	10	190	139	191			193	202	213	205	128		197	208	190	192	193	193
2005	203	190	85		214	194	140	189	142	191	203	66	190	183	107	114			121	2	178	44	185	10	10	189	137	189			187	202	213	205	124		197	208	190	192	193	195
2004	203	190	71		214	194	140	189	146	191	203	57	190	183	107	109		189	108	2	178	44	183	10	10	189	135	189			193	202	213	205	118		197	208	190	192	193	204
2003	201	189	70		214	195	140	189	142	191	203	57		183	127	107		189	121	2	178	44	180	10	10	189	127	189			191	202	213	205	114		28	208	190	192	194	204
2002	198	189	70		214	194		187	141	191	203	57		183	128	99		187	110	2	178	44	182	10	10	188	123	187			198	192	213	205	126		26	208	188	192	193	204
2001	198	189	70		214	194		131	115	84	203	57		183	130	106		187	117	2	178	44	181	10	10	195	116	195		187	197	192	213	205	114		28	208	196	192	194	204
2000	200	189	70		214	180		195	110	83	203	59		183	129	111			118	2	178	44	182	15	10	195	124	195		131	197	192	213	205	113		28	208	196	192	194	204
1999	198	189	70		214	180			108	193	203	58	188	183	118	110		187	114	2	178	44	181	15		195	123	195		131	191	192	213	205	114		26	208	196	159	172	204
1998	193	189	70		214	180		131	122	193	203	59	188	183	117	116	188	129	114	2	178	44	182	14		195	120	188		131	191	192	213	16	144		26	208	196	166	171	204
1997	192	189	55		214	179			111	193	203	39		183	118	48	183		114	2	178		179	14			110				194	192	213	14	144			208	24	164	172	204
1996	195	189	55		214	176			114	193	203	58		183	118	52	205		116	2	178		178	14			108				191	191	213	14	144			208	24	167	165	203
1995	187		55		214	176			117	193	203	39		183	118	54	203		117	2	178		48	15			110				187	192	213	13	144					165	165	203
1994	186		55		214	179			106	193	203	39		183	118	27	205		119	2	178		32	14			103				186	192	213	13	144					164		203
1993	180		48		214	178			97	193	203	39		183		39	205		106	2	178		32	14			99				185	192	213	11	143					168		204
1992	182		48		214	174				189	203	45		183		45	205		111	2	178		32	14			105				174	191	213	11	143					157		205
1991	171		48		213	158				172	203	42		183		49	206		104	2	178		32	11			95				160	191	213	11						148		206
1990	168		48		213	156				44	203	42		183		38	200		102	2	178		32	12			100				163	190	213	10						144		205
1989	155		48		213	154				105	203	42		183		31			97	2	178		32	11			93				164	192	213	10						142		205
1988	150		25		213	159				105	203	42		183		38			100	2	178		32	11			94				158	192	213							138		205
1987	159		27		213	155				105	203			183		29			99	2	178		32	7			93				161	192	213							136		205
1986	153		27		213	154				105	203			183		33			103		178		32	7								191	213							138		205
1985	155		27		213	154				105	203			183		35			95		18		32	7								116	213							134		205
1984	154		27		213	151				105	203			183							18											205	213							126		205
1983	166		27		213	152				105	203			183							18											205	213							123		205
1982	161		27		213	154				105	203										18											205	213							121		205
1981			27		213	154				105	203										18											205	213							123		204
1980			27		213					105	203																					205	213							119		202
Dest	AU	AT	BE	BG	CA	CH	CL	CY	CZ	DE	DK	ES	ET	FIN	FR	GB	GR	HR	HU	IRL	ISL	ISR	ITA	JP	KR	LT	LU	LV	ME	ML	NL	NO	NZ	PL	PT	RO	RU	SR	SV	SE	TR	US

Country-Year Coverage migration stocks

Columns: Destination Countries

Rows: Year

Cell: numbers of source countries, for which we have some observations on number of immigrants for particular year

Dest	AU	AT	BE	BG	CA	CH	CL	CY	CZ	DE	DK	ES	ET	FIN	FR	GB	GR	HR	HU	IRL	ISL	ISR	ITA	JP	KR	LT	LU	LV	ME	ML	NL	NO	NZ	PL	PT	RO	RU	SR	SV	SE	TR	US
Year																							192																					
2010		209				191			171	192	201			193		179			173	209	175						26	208			209	213		209	176			150	209	199		107
2009	209	209	185	208		194	9		172	190	201	112		191		171			180	208	175	44	190	201	27		26	207			207	213		209	177	196		145	208	199	185	133
2008	209	209	187	190		194	6		171	192	201	112		191	127	177			178		175	44	192	199	28	205	26	204		190	209	213			176	198		144	205	199	183	133
2007	209	209	178			194	5		168	193	200	112		191	128	174			174		175	44	188	198	25	205	26	205			207	213			179	196		142	204	199		133
2006	199	209	184		210	194	5		168	193	200	112		193	193	148	189		173	43	175	44	189	195	25	204	23	203			207	213	211		174			143	205	199		96
2005	209	209	182			194	5		166	139	201	112		193	204	97	191		165		175	44	189	183	25	204	23	203	10		208	213			173	195		138	205	199		96
2004	208	209	181			194	5		165	139	201	112		193		101	189		162		172		188	18	25	201	23	200			208	213			171	195		137	200	199		96
2003	208	209	181			194	5		163	138	201	112		193		100	190		156		172		188	18	25		23	203			207	213			167			149	200	199		96
2002	208	209	181			194	167	136	161	138	201	99		193		100			158	177	172		186	42	25		23				207	213		201	167	37	198	148	204	199		96
2001	190	207	181	189	190	194			163	138	201	99		193		97			154		172		187	42	19	201	12			190	206	213	199		166			142	205	199		96
2000	207	191	176			195			161	138	201	99	136	193		102	207		163		172		184	122	19		137		201		206	213			163			140	205	199	196	132
1999	206		174			195			164	138	201	99		193	162	87			163		172		185	42	19		12				204	213			157			136	205	111		96
1998	206		174			195			158	138	201	99		193		104			161		172		38	42	19		12				204	213			154			144	136	111		96
1997	204		55			195			152	138	201	99		193		100	189		159		172		189	42	19		12				204	212			151			144		111		96
1996	192		55		201	195			153	138	201	63		193		90	205		157	36	65		50	18	19		12				204	212	52		150			139		111		96
1995	202		55			195			150	138	201	58		193		85	205		146		65		50	37	19		12				200	212			150			140		111		96
1994	49		55			195			145	137	201	58		193		87	205				66		50	18	19		12				9	212			146					107		126
1993	49		48			195				137	201	58		193		87	205				66		50	18	19		12				9	212			139					104		126
1992	49		48			194				132	201	58		193		82	205				66		185	18	17		12				9	212			129					101		126
1991	168		48		180	194				117	201	58		193		70	205			2	43		184	16	15		12				9	212	51		125					98		126
1990	49	70	48			194				118	201	57		193	76		205				60			42	15		82				9	212			120					100	12	127
1989			48			194				118	201	57		134			204				60			12			8				9	212			121					98		125
1988						194				118	201	57		134			204				60			12	3		8				9	212			119					98		125
1987						194				118	201	57		131			204				60			12	4		8				9	212			118					97		125
1986	75				42	194				118	201	57		125			204			2	60			12	9		8				9	212	75		115					94		125
1985						194				118	201	57		124			204				60			42							9	212			109					95		125
1984						194				118	201			191			204				60			12							9	187			103					89		125
1983						194				118	201						204				60			12							9	187			100							125
1982						194				118	201						204				60			12								193			83					85		125
1981	81		47		42	194				118	201						204			2	59			12								189	75		98							125
1980		64				194				116	201						204							42			79					190			90					95		128
Dest	AU	AT	BE	BG	CA	CH	CL	CY	CZ	DE	DK	ES	ET	FIN	FR	GB	GR	HR	HU	IRL	ISL	ISR	ITA	JP	KR	LT	LU	LV	ME	ML	NL	NO	NZ	PL	PT	RO	RU	SR	SV	SE	TR	US