FACULTY OF LAW, ECONOMICS AND FINANCE

CREA
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Paper
2014-12

Center for Research in Economic Analysis
University of Luxembourg

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July, 2014

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The Cultural Transmission of Environmental Preferences: Evidence from International Migration

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July 1, 2014

Abstract

This paper theoretically and empirically advances the hypothesis that differences in environmental preferences can be traced to cultural differences. In particular, we argue that environmental attitudes such as the willingness to pay for the environment are not solely the effect of local environmental conditions on individual attitudes. On the contrary, we establish that they can also be accounted for by cultural differences across countries. To establish our hypothesis we exploit the natural experiment of international migration flows and establish that the environmental culture of migrants, as has been formed in their country of origin and transmitted across generations, is still prevalent in the host country. Interestingly these cultural differences with respect to environmental awareness are prevalent despite the fact that all migrants in a host country are exposed to the same local environment. In the presence of multiple environmental problems that require collective action, comprehending the driving forces behind the formation of an environmental culture, a potential driver of environmental policies, is critical.

Keywords: Cultural Transmission, Migration, Environmental Preferences

JEL Classification Numbers: Q50; Q58; R23

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1 Introduction

The profound effect of culture on economic outcomes and the formation of public policy has been at the center of a recent debate that explores the transmission of cultural traits. Several aspects of the economy and the society such as the fertility rate, female labor force participation and preference for redistribution have been argued to manifest a cultural component that frames individual economic behavior and ultimately economic policies. As part of culture, these traits are transmitted across generations through social or formal learning. In the light of major ecological problems that requite immediate collective action, the current research explores to what extend environmental preferences manifest a cultural component and whether this cultural trait is transmitted across generations within the family and/or within the social group to which individuals belong.

This paper theoretically and empirically advances the hypothesis that differences in environmental preferences can be traced to cultural differences. In particular, we argue that environmental attitudes such as the willingness to pay for the environment are not solely the effect of local environmental conditions on individual attitudes. On the contrary, we establish that they can also be accounted for by cultural differences across countries. To establish our hypothesis we exploit the natural experiment of international migration flows and establish that the environmental culture of migrants, as has been formed in their country of origin and transmitted across generations, is still prevalent in the host country. Interestingly these cultural differences with respect to environmental awareness are prevalent despite the fact that all migrants in a host country are exposed to the same local environment.

To define culture is a challenging task. As R. Borofsky (2008) puts it: "we talk about culture as something real,..., but culture is in fact an intellectual construct used for describing a complex cluster of human behaviors, ideas, emotions and artifacts. [...] efforts to define culture are akin to trying to encage wind".[1] For the purpose of this paper, we define environmental preferences as a set of values that embodies beliefs, social norms and individual attitudes towards the natural environment, which rule individual behavior towards the environment. The environmental economics literature has so far neglected the analysis of the role of environmental culture. Motivated by the upheaval in public debate on the fragility of the environment and the urgent need for the formation of public policy we believe that addressing this issue will help to better understand what crystallizes environmental awareness. Consequently, governing bodies will be in a better position to design and widely implement environmental friendly policies, as for instance, an environmental education system that will adequately prepare the future generations to protect the future they will inherit.

As far as policy is concerned, comprehending to what extend environmental preferences are driven by the natural environment and to what extend they are driven by cultural

[1] Another related issue is how culure affects human behaviour. For this see Bowles and Gintis (2008).

differences will further improve our knowledge about the status quo of international economic agreements. It could be plausibly argued that the difficulties in finding a consensus on greenhouse gas emission targets for the period 2013-2020 could partly reflect the fact that country members of the United Nations Framework Convention on Climate Change manifest highly heterogeneous attitudes towards environmental protection. Our research suggests that the views expressed by each government are not only directed by purely economic incentives but also reflect the social preferences prevalent in the country.

Our analysis addresses all these issues both theoretically and empirically. To explicitly capture the transmission of cultural traits we exploit the natural experiment of international migration flows. The advantage of such an approach is that since migrants are faced with a different natural environment in the host country than that of their country of origin, we can isolate the cultural elements of their environmental attitudes.

In the theoretical part of the paper we present a model of transmission of environmental preferences following Bisin and Verdier (2001). We define the environmental cultural trait as the disutility from pollution, which ultimately determines the marginal willingness to pay for the reduction of pollution. Agents live in two homogeneous social groups whose populations mix if migration takes place. Agents consume goods whose production causes pollution. As long as there is no migration and thus the social groups are still homogeneous, agents select the amount of consumption, and thus the level of pollution, by maximizing their utility function. When migration takes place, assumingly due to income differences, first generation migrants carry their cultural traits and preferences with them in the destination group. Crucially though they are now facing the possibility that their offspring may acquire the cultural trait of the destination group. Cultural transmission of the origin group trait may occur through two channels. Firstly, if individuals want their culture to prevail in the new environment they should invest in family socialization (direct transmission). Secondly, the cultural transmission may take place through socialization within the migrant group (indirect transmission). We find that the environmental trait is successfully transmitted if the marginal disutility from pollution of migrants is inferior to the marginal disutility of the native population.

The theoretical analysis generates one main testable hypothesis, i.e. that environmental preferences may be culturally transmitted to future generations. Given that the natural environment is different in the host country and the country of origin, the persistence of environmental attitudes similar to those in the country of origin suggests the presence of a cultural component in the formation of environmental preferences.

Our empirical analysis aims to identify the cultural component of environmental preferences exploiting the natural experiment of international migration flows. The focus on immigrants allows to distinguish the effect of the persistence of an “environmental culture” transmitted to them, as opposed to the effect of the local environment in which the migrants are exposed to. In particular, the ”environmental culture” is assumed to be formed either by

individuals' experience at their region of origin (which would be the case for the first generation migrants) or via their parents' and/or peers' culture transmitted to them formally or socially (that would be the case for second generation migrants). On the other hand, once the migrants migrate to a host country (or born there as would be the case for second generation migrants) they are faced with the local environmental conditions and culture that are crucial towards forming their attitudes and incentives. To establish our testable hypothesis we use survey data from the European Values Study (EVS). The EVS dataset comprises 45 European countries and studies the attitudes, beliefs, cultural aspects and preferences of Europeans towards a range of issues such as the environment, religion, politics, the economy, etc. Our study focuses on the environmental culture of individuals. In particular, we focus on the willingness of individuals to pay for the environment. Respondents are given the statement "I would give part of my income if I were certain that the money would be used to prevent environmental pollution" and they are asked if they "strongly agree, agree, disagree or strongly disagree".

The purpose of the empirical section is to explore whether attitudes towards the environment are driven by inertia of cultural attitudes or whether they are simply affected by the natural environment in which an individual resides. To address this issue we exploit the natural experiment of migration that allows us to trace attitudes of migrants that have left their country of origin and currently reside in a host country. The EVS dataset allows us to identify first and second generation migrants, i.e. people who have been born in any of the 45 countries of our sample and currently reside in a different host country, or people who have been born in the host country but whose parents have migrated to the host country from another country. After excluding all people who do not provide information about their country of origin, or their parents' country of origin and keeping all individuals above the age of 18 we have a sample of 2855 migrants coming from the 45 countries. Of those migrants, 1674 are first generation migrants (migrated from the origin country to the host country) whereas 1181 are second generation migrants (their parents migrated from the origin country to the host country but they were born in the host country).

Our findings suggest that the average environmental attitudes in the immigrant's country of origin have a persistent and statistically significant effect on her environmental attitudes in the host country. Therefore differences in environmental attitudes among migrants can be traced to cultural differences originated at their country of origin and despite the fact that all migrants in the host country are faced with the same natural environment. These results are obtained even after introducing in our analysis a large set of individual controls, host country fixed effects (that take care of any unobserved heterogeneity associated with the country of residence, e.g. the native environmental conditions or the native culture) and a number of controls associated with the origin country. Moreover we run a horse-race between average beliefs in the origin country and average level of pollution at the origin country. Reassuringly we find that our cultural variable prevails suggesting that the role of beliefs is

critical for the formation of individual environmental preferences.

The analysis is then extended to capture heterogeneous effects. A first interesting finding is that as far as environmental attitudes are concerned, immigrants in our sample seem to adopt an "integration strategy", i.e., they identify themselves with both the host and the home country. As to the type of cultural transmission both networks and family play a role in the transmission of cultural traits. In the context of the family transmission though, the paternal influence is stronger than the maternal influence. Our empirical findings are robust to a number of alternative assumptions and specifications.

Our findings have a number of important implications with respect to the formation of public policy both at the local and at the international level. First, they highlight the fact that whereas pollution and environmental conditions have a direct effect on the formation of an environmental culture, nevertheless we show that environmental preferences comprise a cultural component that should be considered. Practically, that would imply that governments should not only aim at abatement and pollution reducing policies but also at social learning activities that raise environmental awareness and foster the emergence of an environmental culture. This issue becomes even more critical in an era where international migration flows are rather vast and therefore the median voter is not necessarily a native individual but is instead "a weighted average" of several different cultures. Addressing the concerns and satisfying the needs of such a heterogenous group will not only improve environmental quality but also facilitate the assimilation of migrants. Finally, understanding the role of culture is particularly important at the international level since international environmental agreements are reached by leaders who represent not only the economic incentives of their countries but also the average preferences of their country. Therefore, understanding the driving forces behind the formation of an environmental culture is critical for reaching consensus at all levels.

The paper is organized as follows. Section 2 explores the related theoretical and empirical literature and highlights the contribution of our paper. Section 3 presents a formal model that explores the transmission mechanism. Section 4 presents the data, the empirical strategy and the testable implications of the model. Section 5 subjects our analysis to a number of robustness tests. Finally, Section 6 concludes.

1.1 Related literature

Our study adds to a growing economics literature that looks at the forces of cultural transmission, initiated by the seminal paper of Bisin and Verdier (2001). In the context of environmental economics there exists a limited number of theoretical studies that explore the impact of social norms on the environment. Sethi and Somanathan (1996) study the endogenous evolution of social norms in a local common-property resource setting using evolutionary game theory. They find that with a sufficiently large number of individuals that

are enforcers, the society can reach and remain in a norm-guided society rather then individualistic one. Schumacher (2013) investigates cultural dynamics of environmental preferences, as in Bisin and Verdier (2001), including a feedback from pollution to the cultural dynamics. Pollution affects the proportion of the two cultural traits that exist - environmentalists (greens) and browns. The dynamic transmission is such that green preferences are less likely to be transmitted intergenerationally for low levels of pollution, whereas they are likely to be transmitted for high levels of pollution. Behadj and Tarola (2013) study social norms and their effect on environmental awareness. Authors consider consumption choices between a green and a brown product made under social norms influence: individuals suffer if they buy a brown product when their similar select a green version. This mechanism allows to build a market demand that embodies social norms that concern the environment. Then, the market equilibrium that arises depends on the extent of such social norms. Authors show that brown firms could exist the market due to such consumption externalities.

Our theoretical analysis provides a simple and intuitive mechanism via which environmental culture can be transmitted across individuals. Building upon the baseline cultural transmission model and by plausibly assuming that individuals may migrate, driven primarily by economic incentives, we capture the conditions under which the environmental culture is transmitted and we generate a clear hypothesis to be tested in the empirical section of the paper.

Empirically, our paper locates in the quantitative cultural economics literature. While the idea that culture affects economic outcomes is quite old and much debated in other fields, such as anthropology, the quantitative measures of how much culture matters for economic phenomena starts only in early nineties. Borjas (1992) is a seminal paper that relates the labor outcomes of immigrant workers with their ethnic capital in the USA. Another seminal paper that attempts to identify a cultural component in the propensity to save (Caroll et al., 1994), fails to find a systematic effect of culture probably due to the data restrictions, as admitted by the authors. Crucially thought the first wave of studies suffered primarily from data scarcity.

The emergence of large-scale, systematically collected, datasets such as the World Values Survey, or the European Surveys (ESS and EVS) gave rise to a number of studies that explored the role of culture on several aspects of the society and the economy. The main problems of this second wave of studies was to address endogeneity issues. For instance Tabellini (2005) explores the role of culture on growth, where he had to use historical literacy rates as an instrument for culture. Guiso, Sapienza, and Zingales (2006) attempt to quantify the cultural component embedded in redistribution preferences by proxying culture with a fixed effect dummy of the father's origin country. This approach has met some criticism due to the fact that it does not isolate the type of cultural trait transmitted and could thus capture anything embedded in the term culture. Fernández and Fogli (2009) show the effect of culture

on fertility and female labor participation by using as a proxy for culture the mean attitude at the origin country. This approach addresses the shortcomings of the previous literature and allows to identify the type of cultural trait that is transmitted. Alesina and Giuliano (2010) explore the role of family ties in economic outcomes. In order to establish a causal effect they focus primarily at the behavior of second generation immigrants. Luttmer and Singhal (2011) establish the cultural transmission of preferences for redistribution again by proxying culture with the mean attitudes on redistribution at the home country. To address endogeneity concerns they exploit the multilateral movements of migrants (from many different origin countries) to many different host countries (thus restricting selection concerns). Moreover, they establish the robustness of their results to the choice of a sample of second generation migrants.

The contribution or our paper lies in several dimensions. First, whereas the literature on the transmission of several cultural traits is expanding, our paper is the first to empirically explore and establish the presence and the cultural transmission of environmental attitudes. Second we use as a proxy for culture the mean environmental attitudes at the origin country, which allows us to identify the type of cultural trait that is transmitted, i.e., the willingness to contribute to the environment. Last, we identify the type of transmission (direct versus indirect) and we argue that in the context of direct transmission (i.e., deliberate inculcation by parents) the paternal influence is stronger than the maternal. In our empirical analysis we implement a number of alternative assumptions and conduct various robustness tests that address the challenges of this literature. Our results are robust to all these specifications and confirm the presence of a cultural component in the formation of the environmental culture.

2 The Model

Inhere, we briefly describe a model à la Bisin and Verdier (2001) to explain how environmental preferences are transmitted. Assume two populations of individuals that in period one constitute two within-homogeneous groups.[2] The first group lives in a polluted environment, while the second one enjoys a better environmental quality. Denote these two social groups B and G, correspondingly. Each population is assumed to have a specific environmental trait different from the population of the other group. This difference in trait may have been developed through time and the difference between the two has been augmented due to different levels of income, different levels of technology, etc. Denote these two traits as $Brown$ and $Green$. The environmental trait can be seen as the disutility from pollution, which determines the marginal willingness to pay for the environment, as defined below. A representative agent's utility function writes as:

[2] A group is a generic set of individuals (a country, a village, an ethnic group), who share a common cultural trait.

$$u(c) - h_i(p) + (P_{ii}V_{ii} + P_{ij}V_{ij}),\ i, j = G, B,\ i \neq j$$

where c is consumption and p is pollution, $u(\cdot)$ is the subutility from consumption and $h(\cdot)$ captures the disutility from pollution. Both functions are assumed monotonic increasing. The production of the consumption good(s) generates emissions as a by-product. We assume that each unit of consumption good produced emits $f_i(c)$, $i = B, G$ units of pollution. Thus, pollution technology writes as $p = f_i(c)$, $f'(c) > 0$, $i = B, G$. Each individual has an endowment of income M_i, $i = B, G$. Neglecting for the time being the last part of the utility, the optimal choice of consumption yields

$$\frac{h_i'(p)}{u'(c)} = \frac{1}{f_i'(p)},\ i = G, B \tag{1}$$

The expression $\frac{h_i'(p)}{u'(c)}$ captures the marginal willingness to pay of the representative agent for a unit reduction of pollution. The two social groups show different willingness to pay, governed by the shape of the disutility from pollution $h_i(p)$. At the optimal choice, the marginal willingness to pay is equal to the inverse of the marginal productivity of the polluting technology. Last, by assumption, $u(c) - h_i(f_i(c))$ is a concave function c. Hence, the marginal increase of consumption always dominates the corresponding disutility from the marginal increase in pollution up to a certain level of pollution but once that level of pollution is exceeded disutility from pollution exceeds utility from consumption.

The last part of the utility function, $P_{ii}V_{ii} + P_{ij}V_{ij}$, concerns the cultural transmission of the environmental trait. It captures the empathy of the representative agent for her prole, where $V_{ii} \equiv u(c) - h_i(p)$ is the subutility function of a parent of type i having a child of type i, and $V_{ij} \equiv u(c) - h_j(p)$is the subutility function of a parent of type i having a child of type j. P_{ii} is the probability that a child from a family with trait i is socialized to trait i; and P_{ij} is the probability that a child from a family with trait i is socialized to trait j. Before any migration takes place and assuming that mutations within an homogeneous social group are absent, the event that a new born within a family of type i has a different trait, namely j, never occurs, i.e., $P_{ij} = 0$. This implies that families need not to invest in within-family socialization, which is a costly activity. Let the cost of this investment, when it takes place, be $I_i(e)$, $I' > 0, I'' > 0$, where e denotes resources devoted to within-family education.

In period 1, countries are in autarchy, so no migration takes place. Then, without loss of generality, it is assumed that the trait Green is developed in group G and the trait Brown is developed in group B. Hence, group Green is made of individuals of type G and group Brown is made of individuals of type B. Our definition of types is determined by the cultural trait (the type of function h). The level of pollution and consumption in each group is determined by the interplay of the cultural trait G or B, income M_i and the polluting technology f_i,

which are all assumed to be group-specific variables. Clearly, were income endowments and polluting technologies the same between the groups, the level of pollution in each group will differ only due to cultural difference, $h_i \neq h_j$.

Since before migration, the two populations are homogeneous, then family transmission and the indirect transmission are complementary. Parents can refrain from socializing with their descendants since the process is costly because they will acquire the trait from their friends, hence $I = 0$. This is also known as the *Social Conformity*. The representative agent will maximize

$$\begin{aligned} &\max_{c} u(c) - h_i(p) + (P_{ii}V_{ii} + P_{ij}V_{ij}) \\ s.t.\ &c \leq M_i \\ &p = f_i(c) \end{aligned} \tag{2}$$

Then, substituting these expressions in (**??**), the first order condition obtains again as

$$\frac{h_i'(p)}{u'(c)} = \frac{1}{f_i'(p)},\ i = B, G \tag{3}$$

which determines the implicit optimal solutions of consumption and pollution, $c_i^*(M_i)$ and $p^*(M_i)$, respectively. Notice that since $P_{ij} = 0$ in the period that precedes migration, then, the first order condition is the same as in a classical model with no intergenerational transmission of traits (**??**). At the optimal choice of agents, the marginal willingness to pay to reduce pollution shall equalize the marginal productivity of the polluting technology. As expected, $c_i^*(M_i)$ and $p^*(M_i)$ depend on the shape of h_i and the productivity of the polluting technology.

Assume now that in the second period, migration takes place from population i to j, $i = B, G, i \neq j$. Migration takes place, as explained in the seminal paper of Roy (1951), because of income differences: $M_i < M_j$. Now, a fraction q^i, $i = B, G$ of the population in group j shows a trait i which is different from the native's population trait j. A child born in the migrant family receives the same trait as the parent through the socialization within the family with probability $d^i(q^i)$. If the socialization within the migrant family is not successful, with probability $1 - d_i(q_i)$, then with probability q^i the trait i is acquired by the socialization in the migrant minority, and trait j with probability $q_j = 1 - q_i$. Then, a child of a migrant family shows the trait of his family with probability $d_i(q_i)$, when the trait is acquired at home, plus $(1 - d_i(q_i))\, q_i$, when the trait is acquired within the migrant minority. Hence,

$$P_{ii} = d_i(q_i) + (1 - d_i(q_i))\, q_i.$$

Then, a second generation migrant will not show the same trait as his family with probability $P_{ij} = 1 - P_{ii}$.

After migration, the migrant families, with trait i, maximize the following utility function

$$\begin{aligned} &\max_{e} u(c) - h_i(p) + (P_{ii}V_{ii} + P_{ij}V_{ij}) - I_i(e) \\ s.t.\ &c + e \leq M_j \\ &p = f_j(c) \end{aligned} \tag{4}$$

The first order condition now obtains as

$$\frac{(1 + P_{ii}(q_i))\, h_i'(p) + P_{ij}(q_i) h_j'(p)}{u'(c)} - \frac{I_i'(e)}{u'(c)} \frac{1}{f_j'(p)} = \frac{2}{f_j'(p)} \tag{5}$$

When facing an heterogeneous population, at the optimal choice, the marginal willingness to pay for the environment of a migrant of type i changes with respect to the marginal willingness to pay if he had stayed in his own group. This change occurs even though his cultural trait $h_i(p)$ remains the same. After migration, a migrant's marginal willingness to pay for the environment encompasses the effect of pollution on the utility of the child whether he is of type i or j. Secondly, part of the resources is now devoted to within-family education. Furthermore, the migrant family now receives a different income and finally, she recognizes that the polluting technology is different. This first order condition gives the implicit solutions $c_i^*(M_j, q_i), p^*(M_j, q_i)$ and $e^*(M_j, q_i)$. Bisin and Verdier (2001) show that if the optimal level of investment $e^*(M_j, q_i)$ depends negatively on q_i, then, the trait is successfully transmitted. In the current setup, we can claim the following

Proposition 1 *Environmental preferences are successfully transmitted either directly or indirectly from one generation to the other and thus environmental preferences have a cultural component if the marginal disutilities from pollution satisfy the condition* $h_i'(p) - h_j'(p) < 0$.

Proof. Totally differentiating the first order condition (**??**) with respect to e and q, yields:

$$\frac{de^*}{dq_i} = -\frac{f_j'(c)\left[d'(q_i) * (1 - q_i) + (1 - d(q_i))\right]\left[h_i'(p) - h_j'(p)\right]}{2u''(c) - (1 + P_{ii})\left[h_i''(p) f_j'(c) + h_i'(p) f_j''(c)\right] - P_{ij}\left[h_j''(p) f_j'(c) + h_j'(p) f_j''(c)\right] - I''}$$

Since the denominator is negative for the concavity condition of the utility function with respect to e, then, the sign of $\frac{de^*}{dq_i}$ is given by the sign of $h_i'(p) - h_j'(p)$. If $h_i'(p) - h_j'(p) < (>)0$ then $\frac{de^*}{dq_i} < (>)0$! ■

Discussion The above proposition will form the basis of our testable hypothesis, i.e., whether differences in environmental attitudes can be traced to differences in cultural attitudes. In the light of the fact that cultural differences can hardly be measured we cannot test all the implications of the proposition therefore we will focus primarily on establishing the presence of a cultural component in environmental attitudes.

Nevertheless our theoretical findings are interesting in several dimensions and thus merit some additional analysis. The proposition shows that the level of investment in family socialization depends crucially on the difference in marginal disutility of pollution h_i versus h_j, $i, j = B, G$, $i \neq j$. If the destination group is characterized by individuals with a very high marginal disutility from pollution, then the higher the flow of migrants, the lower the investment of families in within-family socialization because children will obtain the trait from indirect transmission.

Two remarks are in order. First, the condition $h_i'(p) \gtrless h_j'(p)$ does not imply that the level of disutility from pollution of individuals in group i is higher or lower from the disutility from pollution of those in group j. It can well be that individuals in j suffer more pollution with $h_i(p) < h_j(p)$, and vice versa. The condition in Proposition 1 determines a relationship between the *marginal* disutility from pollution at the optimal level of pollution in the group j.

Second, totally differentiating the first order condition for c, we find that $\frac{dc}{dq} < 0$ iff $h_j'(p) > h_i'(p)$ holds. Hence, the higher the flow of migrants q_i, who will transmit their trait successfully (as established in Proposition 1), the lower the level of the pollution p_j produced in the destination country by migrants as compared to the level of pollution they would have produced if they had stayed at the origin country. Furthermore, it is worth noticing that the optimization of the native representative agent of group j is similar to (**??**) . It follows that migration can determine a decrease of the level of pollution in the destination social group depending on the elasticity of the demand for consumption. More precisely, this can happen if the total decline of the per capita consumption ($\frac{dc}{dq} < 0$) dominates the increase of consumption demand due to migrants arrival.

3 Empirical analysis

3.1 Data and variables

We use data from the European Values Study (EVS). The EVS is a large scale cross national survey spanning over the period 1981-2008 and currently has 4 waves (1981, 1990, 1999 and 2008). It comprises a large number of European countries and regions with the maximum number being 45 countries for the fourth wave. The countries in the sample are Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus,

Czech Republic, Czechoslovakia, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iceland, Ireland, Italy, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, USSR, Ukraine and Yugoslavia (Socialist Federal Rep.).

In line with our theoretical analysis, we focus on the willingness of individuals to pay for the environment. We proxy the individual preferences for the willingness to pay for environmental causes, by means of an ordered variable, which measures the extent of agreement to the statement "I would give part of my income if I were certain that the money would be used to prevent environmental pollution". The variable takes the value of 1 for "strongly disagree", 2 for "disagree", 3 for "agree" and 4 for "strongly agree". This variable corresponds to the derivative of the utility function with respect to pollution in the theoretical model. [3]

Additional individual controls are available by the EVS such as age (18+), gender (male-female), employment status (employed-unemployed), highest educational level (8 classifications: inadequately completed elementary education, completed elementary education, incomplete secondary school (technical), complete secondary school (technical), incomplete secondary school (university preparatory), complete secondary school (university preparatory), some university without degree, university with degree) and monthly household income.

In order to address the main purpose of the paper, we need to trace attitudes of migrants that have left their country of origin and currently reside in a host country. We thus focus only on the last wave of the EVS i.e. the 2008 wave, which is the only one to trace back immigrants. We are able to distinguish first and second generation migrants, i.e. people who were born in any of the 45 countries of our sample and currently reside in a different host country, from people who were in the host country but whose parents have migrated to the host country from another country. After excluding all people who do not provide information about their country of origin, or their parents' country of origin and keeping all individuals above the age of 18, we have a sample of 2855 migrants coming from the 45 countries. Of those migrants, 1674 are first generation migrants whereas 1181 are second generation migrants. We also drop observations for which environmental preferences or any other individual control are missing so as to ensure that our results are not being driven by sample selection.

We proxy environmental culture by the average attitudes of natives in the country of origin. We use the same wave of the EVS (2008), and after excluding all migrants we compute the weighted average value of the environmental preferences and the marginal willingness to pay (of all natives). As will become clear in the empirical part of the paper, our findings suggest a persistent effect of culture on individual attitudes despite the fact that the mean preferences

[3]Given the level of pollution p, the higher the materialist attitude captured in the variable 'humans are meant to rule over nature', namely the smaller $h(p)$, the lower the marginal willigness to pay for the enviroment.

at the origin country are primarily representing current preferences. As Fernández and Fogli (2009) have suggested with respect to fertility norms, this finding implies that the cultural component embedded in preferences at each point in time manifests inertia and is present even in later values of the mean cultural attitudes at the origin country. More explicitly, environmental culture measured in 2008 embeds several elements that were present in the environmental culture of the 1990's.

Table **??** reports the demographic characteristics of the sample of migrants, as well as the mean values for the environmental preferences of migrants. For instance, the mean age in our sample is a migrant of 47 years, who has at least completed secondary education. More than half or our sample of migrants are women and employed.

[Table **??** here]

Tables **??** and **??** below report the migration flows within the EVS sample of countries. Columns (1)-(4) for both tables describe the migration flows from each country. For instance in our sample we have 32 individuals who have an Albanian origin. These migrants currently live in 5 destination countries with the most prevalent destination country being Greece hosting 26 migrants out of the 32 in total. Columns (5)-(8) describe the migration patterns as viewed from the host country perspective. For example in Switzerland currently reside 186 migrants from 22 countries from our sample, with the prevalent birth country of migrants being Italy (39 migrants of Italian origin from our sample currently live in Switzerland).

[Table **??** here]

[Table **??** here]

3.2 Empirical strategy

We follow the recent literature on the economic effects of culture (Luttmer and Singhal **?**, Fernández and Fogli **?**) and estimate specifications of the following form for immigrant preferences:

$$n_{irb} = \beta H_b + X_i\gamma + \theta_r + \epsilon_i rb, \tag{6}$$

where n_i denotes immigrant i's attitudes towards the environment, who lives in country r and originates from country b. H_b is the cultural attitude towards the environment among natives in immigrant i's birth country b, X_i is a vector of individual characteristics, θ_r is a fixed effect for residence country r of immigrant i, and ϵ_{irb} denotes the error term. Our coefficient of interest is β. If the attitudes towards the environment of the immigrant were only affected by the relevant economic and institutional factors in the country of residence,

we should expect $\beta = 0$. However a β significantly different from 0 signals an effect of culture on the environmental preferences of the immigrant. Our identifying assumption is that there are no omitted factors correlated with environmental preferences in the birth region other than culture that affect immigrant's preferences in the country of destination. Based on this assumption, estimates of β by ordinary least squares (OLS) can be given a causal interpretation (Luttmer and Singhal **?**, Fernández and Fogli **?**).

Measurement of H_b and endogeneity issues. Luttmer and Singhal **?** and Fernández and Fogli **?** discuss extensively the issues of endogeneity that arise in a specification such as equation (**??**). There is a primary issue of sample selection since workers with strong preferences for the environment can migrate out of countries characterized by little environmental protection. If the environmental differences were the only driving force for migration, all individuals would move to countries exactly aligned with their own environmental preferences. Then, we would not be able to estimate any effect of culture even if cultural effects were in fact strong. However, we believe that selective migration is not an issue in our estimates for at least three reasons. This type of selective migration is already limited for preferences for redistribution in ESS and EVS type of survey data (see Luttmer and Singhal **?**). Moreover, it is well known that the main driving force of migration is the income difference between the origin and the destination country. Hence, selection is economically motivated selective migration. This argument is enough to rule out selection for environmental preferences provided that lower income countries are not the more polluted ones.[4] Finally, following Fernández and Fogli **?**, focussing on 2nd generation migrants provides a tool to minimize selective migration since the 2nd generation migration status is only determined by parents' migration decision, thus exogenous with respect to migrants' attitudes towards environmental conditions in the country of origin.

There is a second issue of omitted variable bias in so far as preferences of 2nd generation migrants can be affected by other factors than culture (e.g. social segregation in highly polluted areas of the destination country), which may influence their environmental preferences. Following Luttmer and Singhal **?** and Fernández and Fogli **?**, we assume that the set of personal, demographic and family characteristics available in the data fully captures the effect of such unobserved factors. We also carry out an extensive set of robustness checks to control for any omitted factor which may confound our main estimates.

[4]It is well-known that income and pollution across countries follows a non-monotonic relationship known as the Kuznets curve. Hence, it is likely that migrants move for income reasons and often they live behind cleaner countries to reside in more polluting ones.

3.3 Results

Table **??** reports estimates for the impact of culture on the marginal willingness (MWP) to pay for the environment. The analysis is undertaken for the full sample of migrants (Columns [1]-[4]), the sample of first generation migrants (Columns [5]-[6]), and the sample of second generation migrants (Columns [7]-[8]). In column [1] we only include the host country dummies to capture any unobserved heterogeneity at the host country level. In column [2] we add controls for income in the country of birth (measured by the log of purchasing power parity adjusted GDP in 2000) as well as relevant demographic, socioeconomic and household characteristics (i.e., age, age square, gender, education, employment status, individual income, marital status, child). In column [3] we enrich the set of individual controls by adding controls on parental and spousal characteristics (i.e., education and employment). The coefficient on the mean marginal willingness to pay at the origin country is positive and statistically significant, suggesting that the native culture confers an effect on migrant's attitudes. In particular the analysis suggests that an 1 unit increase in the mean level of the marginal willingness to pay for the environment at the origin country is associated with a 0.21 increase in the index of the marginal willingness to pay of the migrant.

Column [4] further explores whether this effect is triggered by the origin culture or whether it is driven by the impact of environmental conditions at the origin country on migrants' culture. In particular, we run a horserace regression between the mean marginal willingness to pay at the origin country and environmental quality in the country of birth (nitrous oxide emissions, in logs). This environmental indicator is a good proxy for environmental quality at the origin country as it reflects primarily local (as opposed to transboundary) pollution. Moreover it can be considered as a "stock" pollution variable, thus it is a good proxy of the pollution that the migrants were faced with when they left the country.[5] Reassuringly the results suggest that our cultural variable prevails whereas the local pollution variable is insignificant. The coefficient remains largely intact implying that one unit increase in the mean MWP for the environment in the individual' country of birth is associated with a $0.18 - 0.25$ unit increase in the individual' own marginal willingness to pay.

[Table **??** here]

Similarly columns [5]-[6] and columns [7]-[8] report estimates for the first and second generation immigrants respectively, while employing the full set of controls (columns [5] and [7]) and running the horse-race regressions between pollution at the origin country and mean attitudes at the origin country (columns [6] and [8]). The coefficients of mean environmental attitudes in the country of birth remain positive and significant for both immigrant categories.

[5]Our results remain qualitatively robust to the use of past values of the pollution variable.

On the contrary the coefficient on pollution does not confer any significant effect in any of the two cases.

In particular, the positive and significant coefficient for the second generation immigrants is reassuring as to the fact that a cultural transmission mechanism is at work, and that the results in columns [1]-[4] of Table **??** are not driven by selective migration. Moreover the point estimates for the second generation immigrants are somewhat lower (0.179) than the point estimates for the first-generation (0.258), suggesting that the cultural effect while being present, yet it dissipates over time.

Turning to controls that confer a statistically significant effect, individuals with secondary or tertiary education have stronger environmental attitudes as compared to individuals that only completed primary education. Unemployment adversely affects the willingness to pay. The log of purchasing power parity adjusted GDP in the birth country, which is meant to capture economic differences across countries and thus may result in different preferences for the environment, is not statistically significant.

3.4 Robustness

This section subjects our baseline analysis to a number of robustness tests.

3.4.1 Alternative Methods and Specifications

Table **??** establishes the robustness of the analysis to the use of alternative methods and specifications (the table reports only the results for the coefficient of interest). Row [1] reports the estimation results from a linear probability model. To undertake this analysis we transform our marginal willingness to pay variable into a binary variable. In particular, it takes the value of 1 if individuals "agree" with allocating part of their income for the environment and 0 otherwise. A similar approach is adopted for the construction of the mean preferences at the origin country. Using the new variable, we replicate the baseline OLS analysis. The coefficient is somewhat reduced in significance yet our findings are qualitatively the same.

Row [2] employs the binary variable approach but now estimates a Probit model. The coefficient on the mean MWP at the origin country is significant at the 10% level and increases significantly in magnitude, suggesting that a unitary increase in the mean marginal willingness to pay at the origin country is associated with a 56% increase in the probability that an individual will allocate part of her income for the environment.

Row [3] re-estimates the baseline specification after removing parental controls whereas row [4] removes spouse controls. The results remain largely intact compared to the baseline specification.

Row [5] introduces a control about the size of the city in which the immigrant currently lives. The aim of this control is to capture the differential impact of city size on the formation

of individual attitudes. Finally row [6] controls for NUTS 1 regional fixed effects in an attempt to capture unobserved heterogeneity at the regional level. Crucially, these type of controls can capture not only regional pollution but also regional attitudes towards pollution. Nevertheless, our results remain intact, confirming the persistent effect of the origin culture on environmental attitudes.

[Table **??** here]

3.4.2 The Role of Individual Preferences

Marginal willingness to pay is an attitude that can be affected by a multitude of other factors besides environmental awareness. To address this concern tables **??** and **??** introduce in the baseline analysis a number of controls on individual preferences in an attempt to explore potential other determinants of the marginal willingness to pay. Interestingly, whereas most of these attitudes are indeed correlated with the individual willingness to pay for the environment, our results remain largely intact to the introduction of all these channels.

Table **??** replicates the baseline analysis with the full set of controls for the first generation migrants. Column [1] augment the analysis with a control on whether an individual belongs to an environmental organization or not. As plausibly suggested by the results, members of environmental organizations are more willing to spend money on the environment. Column [2] introduces a control on whether one works unpaid for the environment or not. The coefficient on volunteering for the environment is not statistically significant. Column [3] introduces a control on whether an individual is willing to work unpaid for any type of organization. Interestingly the coefficient is negative and statistically significant at the 1% level denoting that people who work unpaid for any organization are less willing to contribute money to the environment. This result potentially reflects a trade-off between allocating two types of resources, time and money. Column [4] introduces a controls on left-right orientation. There is no significant effect of political attitudes on environmental attitudes. Column [5] introduces a control on whether individuals trust environmental organizations. The coefficient is negative and highly significant suggesting that the lower the confidence of the individuals the less willing they are to contribute money to the environment. Finally, column [6] introduces the full set of controls employed sequentially in columns [1]-[5]. Our coefficient of interest, i.e. the mean willingness to pay at the origin country reduces somewhat in magnitude and significance yet it still strongly confirms the presence of a cultural effect.

[Table **??** here]

Table **??** replicates the same analysis for the sample of the second generation migrants. Our findings are qualitatively the same. Moreover, this table reinforces the strong persistence

of cultural attitudes.

[Table **??** here]

3.4.3 Cultural Assimilation of Migrants

The aim of this section is to explore whether our findings on the transmission of cultural attitudes manifest heterogeneity driven by differences in the assimilation process of migrants. We use five sources of heterogeneity, i.e., citizenship, importance attached to: i) speaking the host language, ii) to ancestry, iii) having lived long in the host country, and iv) respecting the country's laws. Each of these sources of heterogeneity is interacted with our cultural variable, i.e., the mean willingness to pay for the environment at the origin country.

Table **??** replicates the baseline analysis with the full set of controls and introduces a number of heterogeneous effects. Each row reports only the coefficients of the interactive terms. Row [1] explores whether having the country's citizenship has a heterogeneous effect on the marginal willingness to pay for the environment. Our findings suggest that migrants who have gained citizenship in the host country manifest stronger inertia in their willingness to contribute part of their income for the environment. Row [2] documents that migrants who attach more importance to speaking the host country's language, are the ones who are mostly affected by their native culture.

Contrary to the first two rows, row [3] does not report any heterogeneity driven by the importance attached to ancestry. Row [4] documents that migrants who find it important, as part of the assimilation process, to have lived long in the country, are also the ones who manifest stronger willingness to pay driven by cultural inertia. Finally the same result is reported in row [5] which suggests that individuals that find it more important to be respectful towards the host country's laws are also the one who manifest strongest cultural inertial with respect to their environmental attitudes.

[Table **??** here]

Overall the findings of Table **??** suggest that the culture at the country of origin is very important for migrants who are more assimilated to the local culture. This result is somewhat surprising and certainly interesting. Native culture not only is not a burden to the assimilation process but moreover it reinforces adaptation to the host culture. An interpretation of the results is that the migrants who are respectful towards their own culture and sustain several elements of it (in our case their environmental culture) are also the ones that are more likely to show respect for the host culture by embedding it. In sociology this attitude is documented as the "integration strategy", i.e., a strong identification of the migrants to both the host and the origin country (Berry, 1997).

3.4.4 Type and Quality of Cultural Transmission

This section sheds light on the type of cultural transmission. The baseline analysis has been agnostic as to the type of transmission. The main reason for this approach is that we are primarily interested in establishing the presence of cultural inertia in the context of environmental attitudes. The type of transmission is secondary to our analysis. However, the EVS provides a number of controls that allow us to further explore the hypothesis that the transmission of cultural attitudes partly operates either via an external network (e.g., friends) or via parental influence. Table **??** extends the baseline analysis to capture the differential transmission mechanisms. We use several sources of cultural transmission, where each of these sources is interacted with our cultural variable, i.e., the mean marginal willingness to pay for the environment at the origin country. Each row reports only the coefficients of the interactive terms.

Row [1] lends credence to the hypothesis that social networks are crucial into the transmission of cultural attitudes. Introducing a control on the importance attached to friends, we find that higher importance is enhancing the cultural effect on the individual MWP.

Row [2] establishes the family channel by suggesting that individuals who attach more importance to the family are the ones who manifest stronger cultural inertia with respect to their cultural attitudes. Rows [3] and [4] further explore the family transmission mechanisms by introducing respectively controls on whether the father likes reading books or the frequency of political discussions with the father. None of these two mechanisms is reported to confer a significant effect in the transmission of culture. On the contrary, row [5] suggests that individuals coming from families whose father follows closely the news manifest stronger cultural inertia. This result is rather plausible since awareness is a crucial element of environmental attitudes.

Row [6] establishes that stronger families (families in which a divorce has not occurred) are the ones that are more successful in the transmission of cultural traits. Finally, a least expected result is derived in row [7] which establishes that families in which the individual has experienced the death of the father are also the ones who also manifest stronger cultural inertia. The most plausible interpretation of this result is that individuals who have lost their father (who probably died at a late age) are also the ones who have spent more time with him as well.

Table **??** here

Overall, the results in table **??** are supportive of the presence of both channels of cultural transmission, i.e., parental and network transmission. As Bisin and Verdier (2001) have documented, both types of transmission (direct and indirect transmission) are present in the context of environmental awareness.

3.4.5 Parental Birth Place

The last section further explores the role of parental transmission and establishes the robustness of the results to an alternative specification where the origin culture of the mother is employed.

Panel [A] of Table **??** presents the results of the baseline specification, i.e., the one where culture is define by the country of origin of the father, and introduces controls as to the country of origin of the mother. Each of these controls is interacted with our cultural variable, i.e., the mean marginal willingness to pay for the environment at the origin country. Each row reports only the coefficients of the interactive terms. Row [A.1] introduces a term that captures whether the mother has been born in the host country. There appears to be no heterogeneous effect driven by this control. Similar results are obtained in Column [A.2] which introduces a control that captures whether the mother is from the same origin country as the father. Again this control does not confer a heterogeneous effect on our cultural variable. The interpretation of the results is that the transmission mechanism of the paternal culture is rather strong and independent of the effect of the maternal culture.

Table **??** here

This does not imply though that the maternal culture does not matter for the transmission of cultural traits. To explicitly explore this hypothesis panel [B] of Table **??** employs as the baseline specification the one where the country of origin is determine by the mother's country of origin. Reassuringly the results suggest that even in the specification our main findings are confirmed. Interestingly though the point estimate in panel B (0.130) is lower than the point estimate in panel A (0.210) suggesting that the paternal culture is more strongly transmitted than the maternal culture. This result is further reinforced in row [1.B] where we explore the presence of a heterogeneous effect driven by the fact that the father comes from the same origin country. The results suggest that when both parents come from the same origin country the transmission of environmental preferences is stronger.

3.5 Conclusions

Fertility rate, female labor participation, or preference for redistribution are cultural attributes that frame individual economic behavior and ultimately economic policies. As part of culture, these traits are transmitted across generations from parents to children. Are environmental preferences among these cultural traits? This is the main question we tried to answer in this study.

We first presented a model of transmission of environmental preferences following Bisin and Verdier (2001). We defined the environmental cultural trait as the disutility from

pollution, which ultimately determines the marginal willingness to pay for the reduction of pollution. Agents live in two homogeneous social groups whose populations mix if migration takes place. We found that under certain assumptions the environmental trait is successfully transmitted to the next generations.

Then, we empirically tested our theoretical result using survey data on environmental preferences for 45 European countries. We found that the average environmental preference in an immigrant's country of birth has a large and significant effect on her own environmental preference. More importantly this results persists till the second generation of migrants thereby confirming that cultural attitudes are partly driven by a cultural component. The analysis is then extended to capture heterogeneous effects. A first interesting finding is that as far as environmental attitudes are concerned, immigrants in our sample seem to adopt an "integration strategy", i.e., they identify themselves with both the host and the home country. As to the type of cultural transmission both networks and family play a role in the transmission of cultural traits. In the context of the family transmission though, the paternal influence is stronger than the maternal influence. Our empirical findings are robust to a number of alternative assumptions and specifications.

Knowing whether environmental preferences are part of culture improves our knowledge about the status quo of environmental policies and of international economic agreements. As a matter of fact, the difficulties in finding a consensus on greenhouse gas emission targets for the period 2013-2020 could partly reflect the fact that country members of the United Nations Framework Convention on Climate Change manifest highly heterogeneous attitudes towards environmental protection. Similarly in the context of the national policies our findings highlight the fact that the degradation of environmental quality is not sufficient into triggering a shift in the environmental culture. Government should not only adopt policies aimed at improving the environmental quality but also adopting policies that target at changing the culture of individuals towards the environment. According to our findings they have a more direct effect and they persist longer.

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Tables

TABLE 1: Sample Summary Statistics

	(1)	(2)	(3)	(4)	(5)
Variable	Number of Obs	Mean	Standard Deviation	Min	Max
Willingness to Pay for the Environment	2855	2.751	0.881	1	4
Mean Will. to Pay for the Environment (Host)	2855	2.676	0.289	2.115	3.377
Age	2855	47.556	16.611	18	95
Secondary Educational Level	2855	0.492	0.500	0	1
Primary Educational Level	2855	0.339	0.474	0	1
Monthly Income Household	2855	6.868	1.015	3.203	9.211
Female	2855	0.566	0.496	0	1

Summary: The table presents the summary statistics of our 2008 EVS sample. We use a sample of 2885 first and second generation migrants who come from 47 countries of origin and have moved to 47 host countries.

TABLE 2: Migration Flows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Immigration Flows *from* Country				Immigration Flows *to* Country			
Country	Distinct Host Countries	Number of Immigrants from Host Country	Most Prevalent Host Country	Number of Migrants to Prevalent Host Country	Distinct Birth Countries	Number of Immigrants in Host Country	Most Prevalent Origin Country	Number Immigrants from Most Prev. Country
Albania	5	32	Greece	26	1	2	Kosovo	2
Armenia	7	35	Azerbaijan	28	9	110	Azerbaijan	41
Austria	6	17	Switzerland	11	14	81	Germany	21
Azerbaijan	6	50	Armenia	41	4	33	Armenia	28
Belgium	5	74	Luxembourg	63	20	95	Italy	24
Bulgaria	9	21	Turkey	9	6	20	Greece	7
Bosnia-Herzegovina	12	153	Croatia	54	3	16	Serbia	11
Belarus	7	98	Latvia	46	6	136	Russia	88
Switzerland	3	3	Luxembourg	1	22	186	Italy	39
Czechoslovakia	4	6	Hungary	2				
Cyprus	2	2	Greece	1	6	66	Turkey	59
Czech Republic	11	33	Slovakia	13	9	55	Slovakia	43
Germany	15	169	Luxembourg	47	21	72	Poland	14
Denmark	5	20	Norway	6	13	30	Germany	12
Spain	8	41	France	16	10	281	Romania	12
Estonia	3	9	Sweden	4	8	23	Russia	2
Finland	5	33	Sweden	22	4	5	Russia	2
France	10	93	Luxembourg	59	12	69	Italy	16
Great Britain	14	54	Great Britain	9	3	15	Ireland	8
Georgia	10	30	Armenia	17	2	6	Russia	5

Summary: The table reports the migration flows within the 2008 EVS sample of countries. Columns (1)-(4) describe the migration flows from each country. Columns (5)-(8) describe the migration patterns as viewed from the host country perspective.

TABLE 3: Migration Flows (ctd)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Immigration Flows *from* Country				Immigration Flows *to* Country			
Country	Distinct Host Countries	Number of Immigrants from Host Country	Most Prevalent Host Country	Number of Migrants to Prevalent Host Country	Distinct Birth Countries	Number of Immigrants in Host Country	Most Prevalent Origin Country	Number Immigrants from Most Prev. Country
Greece	10	29	Macedonia	9	13	92	Turkey	46
Croatia	13	67	Russia	19	5	71	Bosnia	54
Hungary	12	46	Slovakia	18	8	22	Russia	8
Ireland	3	7	Great Britain	4	3	12	Great Britain	8
Iceland	3	4	Norway	2	9	17	Germany	4
Italy	13	160	Luxembourg	55	1	1	Great Britain	1
Kosovo	6	16	Macedonia					
Latvia	3	13	Estonia	9	10	192	Russia	92
Lithuania	7	24	Latvia	14	5	40	Russia	18
Luxembourg					26	417	Portugal	122
Moldova	6	15	Russia	9	5	55	Ukraine	29
Macedonia	12	29	Ukraine	11	5	18	Greece	9
Netherlands	7	35	Belgium	14	12	27	Germany	10
Norway	4	6	Sweden	3	17	44	Denmark	6
Poland	24	83	Germany	14	4	14	Russia	5
Portugal	7	155	Luxembourg	122				
Romania	14	50	Spain	12	7	67	Moldova	2
Russia	22	600	Estonia	205	5	35	Ukraine	21
Serbia	18	101	Montenegro	30	7	73	Montenegro	31
Slovakia	5	54	Czech Republic	43	7	39	Hungary	18
Slovenia	5	13	Croatia	6	14	66	Bosnia-Herz.	22
Sweden	7	15	Norway	6	22	72	Finland	22
Turkey	16	195	Cyprus	59	3	13	Bulgaria	9
Ukraine	20	165	Belarus	39	9	150	Russia	120

Summary: The table reports the migration flows within the 2008 EVS sample of countries. Columns (1)-(4) describe the migration flows from each country. Columns (5)-(8) describe the migration patterns as viewed from the host country perspective.

TABLE 4: Predictors of Marginal Willingness to Pay for the Environment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Marginal Willingness to Pay for the Environment (MWP)							
	All Immigrants				First Generation		Second Generation	
Mean WTP (Origin Country)	0.148**	0.210***	0.216***	0.209***	0.271***	0.258***	0.176**	0.179**
	(0.060)	(0.054)	(0.054)	(0.052)	(0.087)	(0.085)	(0.083)	(0.086)
Log GDP per Capita (Origin Country)		0.002	0.005	0.010	0.031	0.035	-0.033	-0.034
		(0.018)	(0.019)	(0.020)	(0.031)	(0.032)	(0.032)	(0.030)
Nitrus Oxide Emissions				-0.011		-0.015		0.003
				(0.009)		(0.016)		(0.017)
Age		0.004	0.002	0.002	-0.006	-0.006	0.013*	0.013*
		(0.005)	(0.006)	(0.006)	(0.010)	(0.010)	(0.006)	(0.006)
Age Square		-0.000	-0.000	-0.000	0.000	0.000	-0.000*	-0.000*
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female		0.002	-0.004	-0.004	-0.004	-0.001	0.019	0.020
		(0.031)	(0.036)	(0.036)	(0.048)	(0.048)	(0.051)	(0.051)
Secondary Education		-0.135***	-0.091*	-0.091*	-0.117*	-0.117*	-0.034	-0.034
		(0.043)	(0.050)	(0.050)	(0.069)	(0.069)	(0.064)	(0.064)
Primary Education		-0.240***	-0.186***	-0.187***	-0.205*	-0.205*	-0.147*	-0.147*
		(0.048)	(0.068)	(0.068)	(0.103)	(0.102)	(0.081)	(0.081)
Log Individual Income		0.039	0.021	0.022	-0.021	-0.021	0.052	0.052
		(0.030)	(0.035)	(0.035)	(0.038)	(0.038)	(0.046)	(0.046)
Unemployed		-0.154**	-0.173**	-0.173**	-0.250**	-0.251**	-0.080	-0.080
		(0.076)	(0.077)	(0.077)	(0.103)	(0.103)	(0.093)	(0.093)
Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental and Spouse Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Employment Type	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Child	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	2855	2855	2855	2855	1674	1674	1181	1181
Countries	0.089	0.114	0.123	0.123	0.124	0.124	0.183	0.183

Summary: This table establishes that a migrant's willingness to pay for the environment is positively correlated with the mean attitude on willingness to pay for the environment at her host country, thus highlighting a cultural component in the attitudes towards the environment. Moreover this result is further enhanced by the observation that the actual levels of local pollution at the host country are not a significant determinant of a migrant's attitude. The analysis controls for individual characteristics (age, age square, gender, education, employment status, individual income, marital status, child), parental and spouse characteristics (education, employment), income per capita at home country and mean level of pollution at the home country.

Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 5: Robustness: Altenative Methods and Specifications

		First Generation				Second Generation			
		MWP coef. (Origin)	(SE)	R sq.	Obs	MWP coef. (Origin)	(SE)	R sq.	Obs
		First Generation				Second Generation			
(1)	Linear Probability Model	0.188*	(0.101)	0.113	1674	0.228*	(0.100)	0.134	1181
(2)	Probit Model	0.563*	(0.321)	0.084	1647	0.655**	(0.316)	0.111	1165
(3)	Without Parental Controls	0.257***	(0.084)	0.121	1674	0.179**	(0.083)	0.179	1181
(4)	Without Spouse Controls	0.282***	(0.080)	0.109	1674	0.120	(0.087)	1181	1181
(5)	Controls for City Size	0.268***	(0.090)	0.128	1631	0.196**	(0.089)	0.189	1160
(6)	NUTS 1 FE (Host Country)	0.228**	(0.097)	0.159	1668	0.180*	(0.103)	0.217	1174

Summary: This table establishes the robustness of the baseline analysis to a number of alternative specifications. Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 6: Robustness: The Role of Individual Preferences-First Generation Migrants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Marginal Willingness to Pay for the Environment (MWP) First Generation Immigrants						
Mean WTP (Origin Country)	0.266***	0.263***	0.230***	0.263***	0.276***	0.198*	0.181*
	(0.083)	(0.085)	(0.083)	(0.084)	(0.084)	(0.102)	(0.103)
Belong to Environmental Organizations	0.255**						0.234
	(0.116)						(0.143)
Work Unpaid for the Environment		0.019					–0.212
		(0.134)					(0.176)
No Unpaid Work (Any Organization)			–0.141***				–0.107*
			(0.045)				(0.058)
Distrust Other People				–0.129**			–0.109**
				(0.062)			(0.045)
Left Wing Political Orientation					0.085		0.017
					(0.054)		(0.055)
Distrust Environmental Organizations						–0.198***	–0.178***
						(0.030)	(0.029)
Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.127	0.127	0.131	0.125	0.123	0.151	0.161
Countries	1664	1648	1596	1633	1694	1582	1454

Summary: This table establishes that the cultural component in a (first generation) migrant's willingness to pay for the environment is not driven by other attitudes, such as political attitudes or trust. The analysis controls for individual characteristics (age, age square, gender, education, employment status, individual income, marital status, child), parental and spouse characteristics (education, employment), income per capita at home country and mean level of pollution at the home country.

Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 7: Robustness: The Role of Individual Preferences-Second Generation Migrants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Marginal Willingness to Pay for the Environment (MWP) Second Generation Immigrants						
Mean WTP (Origin Country)	0.206**	0.210**	0.187*	0.186*	0.161*	0.176*	0.22*
	(0.080)	(0.089)	(0.095)	(0.098)	(0.087)	(0.090)	(0.11)
Belong to Environmental Organizations	0.385***						0.26*
	(0.115)						(0.15)
Work Unpaid for the Environment		0.403**					0.14
		(0.154)					(0.15)
No Unpaid Work (Any Organization)			–0.108				–0.09
			(0.066)				(0.07)
Distrust Other People				–0.116*			–0.09*
				(0.060)			(0.05)
Left Wing Political Orientation					0.186***		0.17***
					(0.046)		(0.05)
Distrust Environmental Organizations						–0.163***	–0.16***
						(0.039)	(0.04)
Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.19	0.19	0.19	0.19	0.19	0.21	0.24
Countries	1169	1156	1116	1146	1189	1125	1013

Summary: This table establishes that the cultural component in a (second generation) migrant's willingness to pay for the environment is not driven by other attitudes, such as political attitudes or trust. The analysis controls for individual characteristics (age, age square, gender, education, employment status, individual income, marital status, child), parental and spouse characteristics (education, employment), income per capita at home country and mean level of pollution at the home country.

Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 8: Heterogeneity: Cultural Assimilation of Migrants

	All Migrants			
	MWP coef. (Origin)	(SE)	R sq.	Obs
(1) By Citizenship				
Citizen in the Host Country	0.255***	(0.060)	0.125	2855
Non-Citizen in the Host Country	0.097	(0.071)		
p-value on test of equal coefficients		0.037		
(2) By Importance Attached to Speaking the Host Language				
Language is Important	0.205***	(0.055)	0.124	2855
Language is not Important	0.165	(0.149)		
p-value on test of equal coefficients		0.798		
(3) By Importance Attached to Ancestry				
Ancestry is Important	0.247***	(0.080)	0.124	2855
Ancestry is not Important	0.171**	(0.068)		
p-value on test of equal coefficients		0.798		
(4) By Importance Attached to Having Lived Long in a Country			0.124	2855
Living Long in a Country is Important	0.225***	(0.056)		
Living Long in a Country is not Important	0.150*	(0.080)		
p-value on test of equal coefficients		0.484		
(5) By Importance Attached to Respecting a Country's Law				
Respecting a Country's Law is Important	0.221***	(0.055)	0.125	2855
Respecting a Country's Law is not Important	–0.029	(0.195)		
p-value on test of equal coefficients		0.205		

Summary: This table explores whether the cultural component of the marginal willingness to pay for the environment is affected by the cultural assimilation process of migrants.

Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 9: Heterogeneity: Type and Quality of Cultural Transmission

	All Migrants			
	MWP coef. (Origin)	(SE)	R sq.	Obs
(1) By Importance Attached to Friends				
Friends are Important	0.198***	(0.054)	0.125	2855
Friends are not Important	0.223	(0.189)		
p-value on test of equal coefficients		0.901		
(2) By Importance Attached to Family				
Family is Important	0.209***	(0.056)	0.126	2855
Family is not Important	0.074	(0.150)		
p-value on test of equal coefficients		0.394		
(3) By Father's Pleasure of Reading Books				
Father Likes Reading Books	0.224**	(0.092)	0.128	2855
Father Dislikes Reading Books	0.202**	(0.092)		
p-value on test of equal coefficients		0.878		
(4) By Occurrence of Political Discussions with Father				
Discuss Politics with Father	0.194**	(0.094)	0.125	2855
Never *Discuss Politics with Father*	0.225**	(0.092)		
p-value on test of equal coefficients		0.828		
(5) By Father's Pleasure about Following the News				
Father Likes Following the News	0.197***	(0.062)	0.125	2855
Father Likes Following the News	0.292	(0.282)		
p-value on test of equal coefficients		0.751		
(6) By Experience of Parent's Divorce				
Experienced Divorce of Parents	–0.162	(0.150)	0.125	2855
Did not Experience Divorce of Parents	0.266***	(0.056)		
p-value on test of equal coefficients		0.010		
(7) By Experience of Father's Death				
Experienced Death of Father	0.308***	(0.072)	0.125	2855
Did not Experience Death of Father	0.083	(0.081)		
p-value on test of equal coefficients		0.048		

Summary: This table explores the mechanisms via which the cultural component of the marginal willingness to pay for the environment is transmitted.

Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 10: Heterogeneity: Parental Birth Place

	All Migrants			
	MWP coef. (Origin)	(SE)	R sq.	Obs
(A) Baseline Specification (Origin Country=Father's Birth Country)	0.210***	(0.052)	0.125	2855
(A.1) By Mother's Birth in the Host Country				
Mother is Born in the Host Country	0.287**	(0.110)	0.126	2855
Mother is not Born in the Host Country	0.186***	(0.053)		
p-value on test of equal coefficients		0.403		
(A.2) By Mother's Birth in the Origin Country				
Mother is Born in the Origin Country	0.156**	(0.061)	0.126	2855
Mother is not Born in the Origin Country	0.366*	(0.185)		
p-value on test of equal coefficients		0.310		
B. Baseline Specification (Origin Country=Mother's Birth Country)	0.130**	(0.056)	0.114	2855
1. By Father's Birth in the Origin Country				
Father is Born in the Origin Country	0.140**	(0.064)	0.114	2150
Father is not Born in the Origin Country	0.058	(0.160)		
p-value on test of equal coefficients		0.659		

Summary: This table establishes the robustness of the results to the use of mother's birth country as the baseline specification. Moreover it explores the role of the second parent in the transmission of cultural attitudes towards the environment.

Notes: (i) Robust standard error estimates are reported in parentheses; (ii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

Appendices

A Summary Statistics

TABLE A.1: Classification of Migrants

	(1)	(2)	(3)
Country of Origin	All Migrants	First Generation Migrants	Second Generation Migrants
Albania	32	28	4
Armenia	35	20	14
Austria	17	8	8
Azerbaijan	50	36	14
Belarus	98	60	38
Belgium	74	53	21
Bosnia-Herzegovina	153	95	56
Bulgaria	21	14	6
Croatia	67	42	24
Cyprus	2	2	15
Czech Republic	33	17	3
Czechoslovakia	6	3	9
Denmark	20	11	6
Estonia	9	3	14
Finland	33	19	30
France	93	63	12
Georgia	30	18	56
Germany	168	107	61
Great Britain	54	14	9
Greece	29	14	15
Hungary	46	15	31
Iceland	4	3	1
Ireland	7	7	0

Summary: The table presents the number of migrants coming from each EVS country.

B Variable Definitions and Sources

TABLE A.2: Classification of Migrants (ctd)

	(1)	(2)	(3)
Country of Origin	All Migrants	First Generation Migrants	Second Generation Migrants
Italy	160	70	90
Kosovo	16	8	8
Latvia	13	6	7
Lithuania	24	13	11
Macedonia	29	9	20
Moldova	15	8	7
Netherlands	35	25	10
Norway	6	4	2
Poland	83	46	37
Portugal	155	119	36
Romania	50	34	16
Russia	592	335	257
Serbia	87	56	31
Slovakia	54	32	22
Slovenia	13	5	8
Spain	41	22	19
Sweden	15	9	4
Switzerland	3	1	2
Turkey	195	87	108
USSR	8	4	4
Ukraine	165	95	70
Yugoslavia, Socialist Federal Rep.	14	9	4

Summary: The table presents the number of migrants coming from each EVS country.

B.1 EVS Variables

Outcome Variable

Marginal Willingness to Pay for the Environment. Respondents are given the statement "I am now going to read out some statements about the environment. For each one read out, can you tell me whether you agree strongly, agree, disagree or strongly disagree? I would give part of my income if I were certain that the money would be used to prevent environmental pollution". The variable takes values from 1-4 with 1 denoting "Strongly Disagree", 2-"Disagree", 3-"Agree" and 4-"Strongly Agree".

Explanatory Variable

Marginal Willingness to Pay for the Environment (Origin Country). The variable is constructed by estimating the mean marginal willingness to pay at the origin country. Migrants are excluded from the sample. Moreover individual weights are taken into account. Respondents are given the statement "I am now going to read out some statements about the environment. For each one read out, can you tell me whether you agree strongly, agree, disagree or strongly disagree? I would give part of my income if I were certain that the money would be used to prevent environmental pollution". The variable takes values from 1-4 with 1 denoting "Strongly Disagree", 2-"Disagree", 3-"Agree" and 4-"Strongly Agree".

In our sample there are some migrants that declare as country of origin (or parental origin) countries that do not currently exist in the same format. In these case we have assigned to them the mean value of the marginal willingness to pay (MWP) for the environment of the political successor of the origin country. Migrants coming from Czechoslovakia are assigned the mean MWP of the Czech Republic and Slovakia. Migrants coming from Kosovo are assigned the MWP of Albania. Migrants coming from the Soviet Union are assigned the mean MWP of Russia. Migrants stating that they come from the German Democratic Republic are assigned the mean MWP of Germany. Migrants denoting that they are of Yugoslavian origin are assigned the MWP in Serbian.

Identifying Migrants

First Generation Migrants. First generation migrants are identified using the question "Were you born in [COUNTRY]?". The variable is binary with 1 denoting "yes" and 0 denoting "no".

Second Generation Migrants. Second generation migrants are identified using the questions "Was your father/mother born in [COUNTRY]?". The variable is binary with 1 denoting "yes" and 0 denoting "no"

Origin Country. To identify the origin country of the first and second generation migrants the following questions are used "In which country was your father (mother) born?". The migrant is associated with his father's (mother's) country of origin.

Individual Controls

Age. The age of the respondent.

Female. A binary variable taking the value of 1 if the individual is a female and 0 if the individual is a man.

Education. Education is an ordered variable taking values from 1-3 with 1 denoting "tertiary completed", 2 denoting "secondary completed" and 3 denoting"primary completed". The same classification is used for the controls of paternal, maternal and spouse education.

Income. Denotes the monthly household income (x1000), corrected for ppp in euros

Employment Status. The employment status of the respondent is a categorical variable taking values from 1-4 as follows: 1-"full-time", 2–"part-time or self-employed", 3-"not participant (student, hw, retired, other)", 4-"unemployed".

Occupation Status. The occupation status of the respondent is a categorical variable taking values from 1-4 as follows: 1-"managers, professionals, technical wks" 2-"clerks" 3-"service" 4-"skilled manuals" 5-"unskilled". The same classification is used for the controls of paternal, maternal and spouse education.

Marital Status. The marital status of the respondent is categorical variable taking values from 1-3 classified as follows: 3 "married", 2 "divorced/separated/widowed" and 1 "single".

Child. Child is a binary variable taking the value 1 if there is "at least one child in the household" and 0 otherwise.

Employment Status. The employment status of the respondent is an ordered variable taking values from 1-4 as follows: 1 "full-time" 2 "part-time or self-employed" 3 "not participant (student, hw, retired, other)" 4 "unemployed".

Town Size. The variable denotes the town size in thousand inhabitants classified as follows: 1-"below 5", 2-"5-20" , 3-"20-100" ,4 -100-500" ,5-"over 500".

Years Since Migration. Denotes the year since the migrant moved to the host country.

Individual Preferences Controls

Belong to Environmental Organization. The variable is derived from the question "Do you belong to an environmental organization?". The variable is binary and takes the value 1 if the answer is "yes" and 0 otherwise.

Work Unpaid for the Environment. The variable is derived from the question "Do you work unpaid for the environment ". The variable is binary and takes the value 1 if the answer is "yes" and 0 otherwise.

Work Unpaid for any Organization. The variable is derived from the question "Do you work unpaid for any organization? ". The variable is binary and takes the value 1 if the answer is "yes" and 0 otherwise.

Trust. The variable is derived from the question "Do you think most people can be trusted or one can't be too careful? ". The variable is binary and takes the value of 0 if the answer is "most people can be trusted" and 1 if the answer is "cannot be too careful".

Left-Right Orientation. The variable is constructed based on the question "Which political party would you vote for? Left/right scale". The variable takes values from 1-10 with 1 denoting "left" and 10 denoting "right".

Distrust in Environmental Organizations. The variable is derived from the question "Please look at this card and tell me, for each item listed, how much confidence you have in them, is it a great deal, quite a lot, not very much or none at all? Environmental Organizations". The variable takes values from 1-4 with 1 denoting "A great deal", 2-"quite a lot", 3-"not very much" and 4-"None at all".

Cultural Assimilation Controls

Citizenship. A binary variable that takes the value 1 if the individual is a citizen of the host country and 0 otherwise.

Importantce Attached to Speaking the Host Language. The variable is derived from the question "Some people say the following things are important for being truly [NATIONALITY]. Others say they are not important. How important do you think each of the following is? To be able to speak [THE NATIONAL LANGUAGE]". The variable takes values from 1–4 with 1 denoting "Very Important", 2-"Quite Important", 3-"Not Important", and 4-"Not Important at All".

Importantce Attached to Having a Country's Ancestry. The variable is derived from the question "Some people say the following things are important for being truly [NATIONALITY]. Others say they are not important. How important do you think each of the following is? To have been born in [COUNTRY]". The variable takes values from 1–4 with 1 denoting "Very Important", 2-"Quite Important", 3-"Not Important", and 4-"Not Important at All".

Importantce Attached to Having Lived Long in a Country. The variable is derived from the question "Some people say the following things are important for being truly [NATIONALITY]. Others say they are not important. How important do you think each of the following is? To have lived for a long time in [COUNTRY]". The variable takes values from 1–4 with 1 denoting "Very Important", 2-"Quite Important", 3-"Not Important", and 4-"Not Important at All".

Importantce Attached to Respecting a Host Country's Law. The variable is derived from the question "Some people say the following things are important for being truly [NATIONALITY]. Others say they are not important. How important do you think each of the following is? To respect

[COUNTRY]'s political institutions and laws". The variable takes values from 1–4 with 1 denoting "Very Important", 2-"Quite Important", 3-"Not Important", and 4-"Not Important at All".

Cultural Assimilation Controls

Importance Attached to Friends. The variable is constructed based on the question "Please say, for each of the following, how important it is in your life. Friends and Acquaintances". The variable is classified as follows: 1-"very important", 2-"quite important", 3-"not important", 4-"not important at all".

Importance Attached to Family. The variable is constructed based on the question "Please say, for each of the following, how important it is in your life. Family". The variable is classified as follows: 1-"very important", 2-"quite important", 3-"not important", 4-"not important at all".

Father Reading Books. The variable is constructed based on the question "When you think about your parents when you were about 14 years old, could you say whether these statements correctly describe your parents? My father liked to read books". The variable is classified as follows: 1-"yes", 2-"to some extend", 3-"don't know", 4-"no".

Occurence of Political Discussions with Father. The variable is constructed based on the question "When you think about your parents when you were about 14 years old, could you say whether these statements correctly describe your parents? I discussed politics at home with my father". The variable is classified as follows: 1-"yes", 2-"to some extend", 3-"don't know", 4-"no".

Father's Pleasure about Following the News. The variable is constructed based on the question "When you think about your parents when you were about 14 years old, could you say whether these statements correctly describe your parents? My father liked to follow the news". The variable is classified as follows: 1-"yes", 2-"to some extend", 3-"don't know", 4-"no".

Experience a Parent's Divorce. The variable is derived from the question "Did you even experience a parent's divorce? ". The variable is binary and takes the value 1 if the answer is "yes" and 0 otherwise.

Experience a Father's Death. The variable is derived from the question "Did you even experience a father's death? ". The variable is binary and takes the value the value 1 if the answer is "yes" and 0 otherwise.

B.2 Macroeconomic Variables

Income per Capita. GDP per capita is gross domestic product divided by midyear population. GDP (current 2000%$) is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. The data comes from the 2000 World Development Indicators dataset.

Nitrus Oxide Emissions. Nitrous oxide emissions is measured as thousand metric tons of CO2 equivalent. It measures emissions from agricultural biomass burning, industrial activities, and livestock management. The data comes from the 2000 World Development Indicators dataset.