

# Who is Against Immigration?

## A Cross-Country Investigation of Individual Attitudes towards Immigrants

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first version: November 2002; this version: February 2005

### Abstract

This paper empirically analyzes both economic and non-economic determinants of attitudes towards immigrants, within and across countries. The two individual-level survey data sets used, covering a wide range of developed and developing countries, make it possible to test for interactive effects between individual characteristics and country-level attributes. In particular, trade and labor-economics theories of labor markets predict that the correlation between pro-immigration attitudes and individual skill should be related to the skill composition of natives relative to immigrants in the destination country. Skilled individuals should favor immigration in countries where natives are more skilled than immigrants and oppose it in the other countries. Results based on both direct and indirect measures of the relative skill composition of natives to immigrants are consistent with these predictions. Individual skill and pro-immigration attitudes are positively correlated in countries where the skill composition of natives relative to immigrants is high. Individuals with higher levels of skill are more likely to be pro-immigration in high per capita GDP countries and less likely in low per capita GDP countries. Non-economic variables also appear to be correlated with immigration attitudes but they don't seem to alter significantly the results on the economic explanations.

*JEL classification:* F22, F1, J61.

*Keywords:* Immigration Attitudes, International Migration, Political Economy.

## 1 Introduction

Are attitudes towards foreigners influenced by economic considerations or are they driven exclusively by non-economic issues? Do individuals feel threatened by the labor-market competition of foreigners? Are people concerned about security and cultural issues? More generally, who is against immigration, why, and in which countries?

I address these questions by empirically analyzing attitudes towards immigrants within and across countries, using two individual-level survey data sets.<sup>1</sup> I investigate both economic and non-economic explanations of preference formation and relate the results on the economic determinants to standard trade and labor-economics theories of immigration.

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<sup>1</sup>I will use the terms *attitudes* and *preferences* interchangeably in the text.

Among the economic determinants, the main focus of this paper is on labor-market ones. Standard trade and labor-economics theories of labor markets, such as the Heckscher-Ohlin model and the factor-proportions-analysis model, predict that immigration attitudes depend on the impact on factor prices of changes in relative factor supplies due to immigration. If factor-price-insensitivity holds, immigration does not affect factor prices and individual skill should not be correlated with immigration attitudes. If not, assuming that capital is internationally mobile, the correlation between immigration attitudes and individual skill should be related to the skill composition of natives relative to immigrants in the destination country. If skilled and unskilled labor are complements, skilled individuals should favor immigration if natives are more skilled than immigrants, since in this case immigration reduces the relative supply of skilled to unskilled labor and raises the skilled wage. The opposite is true for countries where natives are less skilled than immigrants.

My first set of empirical results is based on a restricted sample of countries, for which I can use a *direct* measure of the relative skill composition of natives to immigrants. I find that the cross-country pattern in the correlation between skill and immigration attitudes is consistent with the labor-market predictions of the factor-endowments models. Skilled individuals are more likely to be pro-immigration in countries where the skill composition of natives relative to immigrants is high. Based on the restricted sample of countries, I find that per capita GDP and the relative skill composition of natives to immigrants in the destination country are positively correlated, that is rich countries are more likely to receive immigrants who are less skilled than natives and, viceversa, for poor countries. Therefore I use per capita GDP of the destination country as an *indirect* measure of the relative skill composition of natives to immigrants, which allows me to broaden the analysis to a more extended sample of countries. My results show that, the richer the host country is, the more positive is the impact of schooling on favorable opinions about immigrants. Individual skill is positively correlated with pro-immigration preferences in high per capita GDP countries and negatively correlated with pro-immigration preferences in low per capita GDP countries.

Overall, my findings are consistent with the labor-market predictions of the Heckscher-Ohlin model, in the absence of factor-price-insensitivity, and of the factor-proportions-analysis model. The robustness of the factor-endowments explanation is confirmed by additional results based on individual-level data on occupation. Individuals in occupations which experience a bigger increase in relative supply due to immigration, that is with a higher ratio of immigrants to natives, are less likely to be pro-immigration. In addition, my results on labor-market determinants don't change when I control for other economic explanations of immigration preferences.

Finally, I analyze correlation patterns between attitudes towards immigrants and individual answers to questions on non-economic issues. The inclusion in the empirical model of these additional regressors allows me to test the robustness of the empirical regularity previously observed. Non-economic factors do not seem to alter significantly the results on the economic explanations. After controlling for how individuals feel about the impact of immigration on crime rates and on cultural and national identity, and taking into account people's racist attitudes and their feelings about political refugees and illegal immigration, I still find evidence of the same cross-country pattern, in terms of the correlation between individual skill and pro-immigration attitudes.

Various papers have analyzed preferences on immigration policy but, in most cases, they have been characterized by the use of indirect measures of people's attitudes or by the focus on a single

country, for example the United States and Great Britain.<sup>2</sup> In addition, few empirical works have related their results to the predictions of theoretical models. This paper combines three elements of the previous literature: the use of a direct measure of individual immigration preferences, the comparison of attitudes both within and across different countries, and the interpretation of the empirical results in terms of the predictions of theoretical models.

Indirect measures of policy opinions, such as those based on voting and lobbying, are imperfect measures of preferences, because they are jointly determined by individual attitudes and the institutional structure of government (Scheve and Slaughter 2001b, 2001c). In a cross-country work, such as in this paper, this would be a serious shortcoming, since institutions are certainly different across nations.<sup>3</sup> To get around this problem, I use two individual-level data sources: the 1995 National Identity module of the International Social Survey Programme and the third wave of the World Value Survey data set, carried out in 1995-1997. The first source contains data on 22 countries, mostly developed economies, while the second data source gives information on 44 nations, most of which are developing countries. Where possible, I test the robustness of the results using both data sets. The cross-country dimension of the two surveys allows me to test for interactive effects between individual-level characteristics and country-level variables. The advantage of this empirical strategy is that it makes it easier to overcome interpretational ambiguities that arise in single-country studies (Citrin et al. 1997, Espenshade and Hempstead 1996, Kessler 2001, Scheve and Slaughter 2001b, Dustmann and Preston 2001a, 2001b) or in multi-country analyses that do not explore cross-country heterogeneity of coefficients (Bauer et al. 2000, Brücker et al. 2001, Chiswick and Hatton 2002, Gang et al. 2002).<sup>4</sup>

The empirical literature on immigration preferences reaches different conclusions on the role of economic factors relative to non-economic ones. For the United States, while Espenshade and Hempstead (1996) find mostly evidence in favor of non-economic explanations of preference patterns, the results in Scheve and Slaughter (2001a) and in Kessler (2001) highlight the importance of economic determinants. Citrin et al. (1997) interpret their findings as providing weak evidence for the role of personal economic circumstances in U.S. immigration preferences. Finally the analysis in Dustmann and Preston (2001b) points out that, in Great Britain, economic determinants matter for attitudes towards immigrants, but that racial prejudice is definitely the most important factor in preference formation.

In this paper I find evidence that both sets of factors, economic and non-economic ones, are important. In a wide range of countries, attitudes towards immigrants appear to be related to labor-market concerns, security and cultural considerations, as well as individual feelings towards political refugees and illegal immigration. In particular my analysis reveals that, controlling for

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<sup>2</sup>The empirical literature on individual immigration preferences includes works focusing on the United States (Citrin et al. 1997, Espenshade and Hempstead 1996, Kessler 2001, Scheve and Slaughter 2001b) and on Great Britain (Dustmann and Preston 2001a, 2001b) and papers with a cross-country perspective (Bauer et al. 2000, Brücker et al. 2001, Chiswick and Hatton 2002, Gang et al. 2002, O'Rourke and Sinnott 2003). The literature also offers historical accounts of the political economy of immigration restrictions at the turn of last century (Goldin 1994, Timmer and Williamson 1996).

<sup>3</sup>That is, using indirect measures, the variation in outcomes may be due to differences in attitudes or in institutions.

<sup>4</sup>Since I began my work I have become aware of another related, but independent paper on individual immigration attitudes (O'Rourke and Sinnott 2003) which is the only other work besides mine to relate correlations at the individual level to country characteristics.

non-economic factors, the economic variables play a key and robust role in preference formation over immigration policy. My results are consistent with the predictions of standard economic models and reject a view of the world in which only non-economic considerations shape attitudes towards foreigners.

From a methodological point of view, the paper most related to my work is Scheve and Slaughter (2001b), who analyze individual preferences on immigration policy in the United States using the 1992 National Election Studies survey. The focus of their work is on determinants of immigration preferences working through the labor market. As in my paper, Scheve and Slaughter use a direct measure of individual opinions and closely relate the empirical analysis to the results of theoretical models. The main differences between Scheve and Slaughter's study and my paper is that I adopt a cross-country perspective, which is richer in terms of theoretical predictions, and I focus on both economic and non-economic determinants of immigration preferences. My paper is also related to Scheve and Slaughter's (2001c) work on trade opinions in the U.S. and to the cross-country literature on individual preferences on trade policy (O'Rourke and Sinnott (2001) and Mayda and Rodrik (2005)).

To conclude, there are two main motivations behind the analysis of immigration attitudes. First, individual-level opinions on immigration offer indirect information about the distributional impact of factor movements, as perceived by the public. Controlling for non-economic determinants, it is possible to test whether these preferences are consistent with the effect of immigration on individual returns, as predicted by standard economic models. The main focus of this paper is on models that explain preferences in terms of individuals' and countries' factor endowments, the Heckscher-Ohlin trade model and the factor-proportions-analysis labor model. The value of this approach, based on individual attitudes, is that it provides new ground for testing the income-distribution predictions of theories of immigration.

Another reason why it is interesting to analyze immigration attitudes is that they are likely to be a primary determinant of international migration flows. Individual preferences shape the demand side of immigration-policy decisions which are also affected, on the supply side, by policymakers' preferences and the institutional structure of government (Rodrik 1995). Immigration policies, in turn, are likely to be a major factor explaining the recent evolution of labor movements. The size of immigrant flows depends on both the host country's demand for immigrants (i.e., immigration policies) and migrants' decisions to move, according to political and economic incentives. Empirical evidence suggests that the economic forces driving the supply side of international immigration – cross-country wage and income differentials, reduced transport, communication and information costs, opportunities for risk diversification – have become stronger in the last decades. Restrictive policies, then, most likely explain the relatively small scale of international immigration (Faini 2001).<sup>5</sup>

The outline of the paper is as follows. Section 2 describes the data sets. Section 3 focuses on economic explanations of attitudes, while Section 4 introduces non-economic determinants of immigration preferences. In Section 5 I conclude.

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<sup>5</sup>The comment on the small size of immigrant flows is relative to the past (nineteenth century) and to other globalization forces such as trade flows.

## 2 Data

This paper uses two individual-level survey data sets and aggregate data on international migration and on destination and origin countries of immigrant flows. The two survey data sets contain information on the socio-economic background of each respondent and on his opinions on topics such as immigration and trade policies, patriotism, and national identity. Therefore, the two surveys allow me to identify both stated immigration preferences and individual characteristics that explain such preferences in standard economic models.

The first survey comes from the International Social Survey Programme (ISSP). I use the 1995 ISSP National Identity module (ISSP-NI) covering more than 20,000 respondents from 22 countries, including the United States, Canada, Japan and several Western European countries. The survey also includes a few Eastern European countries and one developing country, the Philippines.

I focus on survey answers to the question: “There are different opinions about immigrants from other countries living in (respondent’s country). (By “immigrants” we mean people who come to settle in (respondent’s country).) Do you think the number of immigrants to (respondent’s country) nowadays should be: (a) reduced a lot, (b) reduced a little, (c) remain the same as it is, (d) increased a little, or (e) increased a lot”.<sup>6</sup> Besides the five ordered answers, the survey format also allows for “can’t choose” (CC) and “not available” (NA) responses. I recode respondents’ answers (1=“reduced a lot”, to 5=“increased a lot”), and I call this variable *Immig Opinion*. I also create a dichotomous variable, *Pro Immig Dummy*, equal to one for individuals who express pro-immigration attitudes (i.e., for those replying “increased a little” or “increased a lot”).<sup>7</sup>

The ISSP-NI data set includes a host of other questions on immigration-related issues. I focus on the question above as it is the most closely related to the theoretical predictions. However, in various specifications, I use responses to other immigration questions as explanatory variables.

To control for each individual’s socio-economic background, I use information from ISSP-NI questions on age, gender, parents’ foreign citizenship, years of education, area of residence (rural vs urban), subjective social class, political affiliation with the right and trade union membership. I also use each respondent’s individual real income as a basic indicator of individual economic status.<sup>8</sup> A measure of individual skill is constructed from data on years of education and is used to test the implications of the factor-endowments models. Survey answers on individuals’ occupation are also employed, to test the robustness of the factor-endowments results. Responses on topics such as national pride and identity, multiculturalism, illegal immigration and political refugees are used to control for non-economic determinants of immigration policy preferences.<sup>9</sup>

The ISSP-NI data set mostly covers high and middle-income economies. I complement the results from this source with the findings based on the third wave of the World Value Survey (WVS), carried out in 1995-1997. The WVS data set includes more than 50,000 respondents from 44 mostly developing economies. The immigration question in the WVS asks the following: “How

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<sup>6</sup> A similar question has been analyzed in most of the empirical literature on individual immigration preferences (Espenshade and Hempstead 1996, Scheve and Slaughter 2001b, Citrin et al. 1997, and Kessler 2001).

<sup>7</sup> I exclude non-nationals from the sample. CC and NA responses are coded as missing values for both variables. Using Heckman selection model, I find no evidence that omitting CC and NA responses results in a selection bias.

<sup>8</sup> Definitions of these variables are at the end of Table 1a.

<sup>9</sup> The details about the construction of these variables are given in a related paper on trade policy preferences (Mayda and Rodrik 2005) and in the Tables and Appendix.

about people from other countries coming here to work. Which one of the following do you think the government should do? (a) Let anyone come who wants to? (b) Let people come as long as there are jobs available? (c) Place strict limits on the number of foreigners who can come here? (d) Prohibit people coming here from other countries? (e) Don't know." I transformed answers to the WVS immigration question into two dependent variables: an ordered variable, *Immig Opinion (WVS)*, and a dichotomous variable, *Pro Immig Dummy (WVS)*, both constructed after excluding "Don't know" responses from the sample.<sup>10</sup>

Since ordered probit results are harder to summarize, I will present and discuss the results from probit estimation using the dichotomous measure of immigration attitudes.<sup>11</sup> The tables at the end of the paper – based on either one of the two data sets – present the probit marginal effects and corresponding standard errors of each regressor, holding all other variables at their mean. All the regressions include country fixed effects, to control for additive country-specific unobserved effects, and have standard errors adjusted for clustering on country.<sup>12</sup>

Individual-level information from both data sources is combined with additional data on immigration flows and stocks from the International Migration Statistics data set for OECD countries (OECD 1997). Immigrants' *flows* numbers are based on the OECD's Continuous Reporting System on Migration (SOPEMI). Data on the origin and labor market characteristics of immigrants' *stocks* is based on survey and census data from Eurostat and national governments.

In particular, in this paper I use statistics on immigrant inflows into OECD countries in the period 1990-1995; on native and immigrant populations by level of education in 1995<sup>13</sup>; and on native and immigrant populations by occupation in 1995, according to the 1988 International Standard Classification of Occupations (ISCO).<sup>14</sup>

Data on religious adherence in the host country and in the main origin countries of foreigners comes from Barro and McCleary (2002), while statistics on language in the destination and source countries of immigrants and on the colonial relationship between pairs of countries come from Glick and Rose's website.<sup>15</sup> Finally, data on exchange rates, purchasing power parity conversion factors and population come from the 2001 World Development Indicators CD-ROM, developed by the

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<sup>10</sup>I exclude foreign-born individuals from the sample. I then recode respondents' answers to construct the variable *Immig Opinion (WVS)*, which ranges from 1="prohibit people coming here from other countries" to 4="Let anyone come who wants to". *Pro Immig Dummy (WVS)* is defined as follows: *Pro Immig Dummy (WVS)* =1, if *Immig Opinion (WVS)*=3 or 4; 0, if *Immig Opinion (WVS)*=1 or 2. Based on Heckman selection model, I find no evidence of selection bias after omitting "Don't Know" responses.

<sup>11</sup>Estimates of the ordered probit coefficients, using either one of the two data sets, are consistent with the results based on the dichotomous variable and are available upon request from the author. Similarly, my results don't change when I keep CC and NA responses in the ISSP-NI data set and "Don't Know" responses in the WVS.

<sup>12</sup>Fixed-effects estimation of a probit model may lead to inconsistent estimates (incidental parameter problem). This is not an issue with the ISSP and WVS data sets as they are long panels (many individuals for each country).

<sup>13</sup>Education levels are coded according to the International Standard Classification of Education (ISCED): 1. less than first stage of 2nd level (ISCED 00, 01 and 02); 2. completed 2nd level (ISCED 03 and 04); 3. completed 3rd level (ISCED 05 and over); 4. other general education, not applicable and no answer. ISCED level 02 usually refers to a ninth grade education.

<sup>14</sup>Occupations by 1988 ISCO are classified as follows: 1. Armed forces; 2. Legislators and managers; 3. Professionals; 4. Technicians; 5. Clerks; 6. Service and sales workers; 7. Agricultural and fishery workers; 8. Craft and related trades workers; 9. Plant and machine operators; 10. Elementary occupations.

<sup>15</sup>Glick and Rose's website is at <http://faculty.haas.berkeley.edu/arose/RecRes.htm#Software>

World Bank. Tables in the Appendix contain country-level summary statistics of the main variables used in the paper.

### 3 Economic Determinants of Individual Attitudes

Most likely, both economic and non-economic factors shape individual preferences over immigration policy. Among the economic determinants, one of the most important is likely to be the impact of immigrants on natives' returns through factor markets. The main results of my analysis are related to this determinant. By considering this aspect of preference formation, I investigate whether individuals reveal, through their attitudes, a self-interest maximizing or economically-rational behavior, as assumed in the models of Section 3.1.

Another important economic factor shaping people's stance is the perceived fiscal impact of immigration on the welfare state. In some receiving countries immigrants are likely to belong to the bottom of the income distribution, which makes them probable beneficiaries of costly welfare programs. This in turn will affect natives' individual contributions to and benefits from the welfare state. My results shed light on this issue as well. Finally, the variation in attitudes towards foreigners may also depend on differences in individual perceptions of the economy-wide benefits and costs of immigration. I test the robustness of the results based on economic self-interest in factor markets to this alternative explanation.

Before narrowing the focus of the analysis, it is interesting to look at the most basic patterns in the two surveys. Table 1a, based on the ISSP-NI data set, and Table 1b, based on the WVS figures, present the results from a benchmark model of immigration attitudes, whose focus is on the social, demographic and economic background of each respondent. As both sets of results show, older people favor immigration restrictions, as do individuals living in more rural areas and in smaller towns.<sup>16</sup> More educated individuals and respondents with family ties to non-nationals are more open to immigration. Males are more likely to be pro-immigration in the ISSP-NI data set: this gender difference disappears using the WVS statistics.<sup>17</sup> Affiliation with more conservative political parties is negatively correlated with pro-immigration preferences, in both sets of findings. Using the ISSP-NI data set, individual (real) income, social class, and trade union membership do not have a significant impact on immigration preferences. On the other hand, relative income positively affects attitudes towards foreigners in the WVS sample of countries.

One of the most robust findings in the benchmark model, estimated with both the ISSP-NI and the WVS data sets, is a significant and positive impact of education on pro-immigration attitudes. The variables used in Tables 1a and 1b as measures of schooling, *years of education* (in the ISSP-NI data set) and *educational attainment* (in the WVS data set), are among the most often employed in the labor and growth literatures as indicators of levels of skill. Thus, these initial results reveal that, on average, in the sample of countries considered, there exists a positive and significant correlation between individual skill and pro-immigration preferences. These average results hide cross-country heterogeneity, as will become clear in the empirical analysis of Sections 3.2 and 3.3.

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<sup>16</sup>The statistical significance of these results changes across specifications.

<sup>17</sup>The gender effect disappears using the ISSP-NI data set too, once I control for the immigrants-to-natives ratio in the individual's occupation (Table 3a).

### 3.1 Factor-Endowments Models of Immigration-Policy Attitudes

In this section I look at the predictions of two economic models - the Heckscher-Ohlin (HO) model and the factor-proportions-analysis (FPA) model - as regards the impact of immigration on individual utilities through factor markets. In terms of the distributional effect of immigration, the interaction between individual factor type and each country's factor endowments plays a key role in both the HO model and the FPA model. Hence, I will refer to both as factor-endowments models.

The HO model is one of the workhorse theories of international trade. It focuses on small open economies, characterized by constant returns to scale and perfect competition in each sector. At least two goods are assumed to be produced, so that trade can take place between countries. In addition, factors are perfectly mobile across sectors.

The key feature of the HO model is differences across economies in relative factor endowments. Through trade, each country either exports or imports the services of a factor of production according to whether it is abundantly or poorly endowed with it, relative to the rest of the world.

The predictions of the HO model, with regard to the impact of immigration on factor rates of return, depend on a key condition that relates the number of internationally-traded goods produced in the country ( $n$ ) to the number of primary factors of production ( $m$ ). If  $n \geq m$ , *ceteris paribus* a sufficiently small increase of a factor's supply does not have any effect on factor rates of return: factor-price-insensitivity holds.<sup>18</sup> If the shock to the factor's supply is substantial or if  $n < m$ , a change in a factor endowment affects factor prices. Thus, in the HO model, the impact of immigration on factors' rates of return depends on the extent of diversification of the country's production, in terms of internationally-traded goods, and on the size of the factor supply shock.

To gain intuition regarding these predictions, I present a simple model that suits the empirical analysis in the paper: the  $3 \times 2$  HO model with and without diversification. The  $3 \times 2$  HO model encompasses both factor-endowments models since the labor-market predictions in the case without diversification (only one good produced) are the same as in the factor-proportions-analysis (FPA) model described in Borjas (1999a).

Consider a small open economy with three factors (skilled labor, unskilled labor, and capital) which produces two goods. Capital is assumed to be internationally mobile ( $r = r^*$ ), so that  $dr = 0$ . The native workforce has a fraction  $b$  of skilled workers and a fraction  $(1 - b)$  of unskilled workers ( $N = b * N + (1 - b) * N$ ). The immigrant workforce has a fraction  $\beta$  of skilled workers and a fraction  $(1 - \beta)$  of unskilled workers ( $M = \beta * M + (1 - \beta) * M$ ). The total labor force is  $L = N + M$ .

Two sets of conditions hold in equilibrium on the production side, the production equilibrium conditions - price is equal to unit cost for each good produced - and the set of factors' full-employment conditions:

$$p_i = b_i(w_S, w_U, r^*), \quad i = 1, 2 \tag{1}$$

$$V_j = y_1 b_{1j}(\cdot) + y_2 b_{2j}(\cdot), \quad j = S, U, K \tag{2}$$

where  $p_i$  and  $y_i$ ,  $i = 1, 2$  are respectively prices and quantities produced of each good and  $b_i(\cdot)$ ,  $i = 1, 2$  are sectors' unit cost functions, characterized by partial derivatives with respect to each factor price  $b_{ij}(\cdot)$ ,  $j = S, U, K$ .<sup>19</sup>  $V_S = bN + \beta M$ ,  $V_U = (1 - b)N + (1 - \beta)M$  and  $V_K$  are respectively the

<sup>18</sup>I assume that no factor-intensity reversals occur.

<sup>19</sup>The partial derivatives  $b_{ij}(\cdot)$  give the cost-minimizing requirement of input  $j$  to produce one unit of good  $i$ .

total supply of skilled workers, unskilled workers and capital, and  $w_S, w_U$  and  $r^*$  are respectively the price of skilled labor, unskilled labor and capital.

If the country produces both goods and the immigration shock is sufficiently small, factor prices are insensitive to changes in factor endowments induced by immigration.<sup>20</sup> The reason is that factors' rates of return are pinned down by system (1) in 2 equations and 2 unknowns. Unless goods' prices change in international markets or technology improves, factor prices do not change. In this case, immigration-induced changes in factor supplies only affect system (2) and are absorbed through Rybczynski effects, with reallocation of factors across sectors.

If the country only produces one good or if the immigration shock is big enough to change which goods are produced, factors' rates of return change due to immigration.<sup>21</sup> In particular in the former case, without diversification, the labor-market predictions of the (open-economy) HO model are the same as in the (closed-economy) FPA model, which has been widely used in the labor-economics literature (Borjas 1999a, Borjas et al. 1996 and Borjas et al. 1997). In the FPA model a single aggregate output market is assumed. In addition, as in the HO model, a national labor market characterizes every factor of production, that is factors can move costlessly within country borders.

The FPA model predicts that any immigration-induced change in the country's relative supply of skilled to unskilled labor has an impact on factor prices. Therefore what is crucial is the difference between the fraction of skilled workers in, respectively, the native and the immigrant workforce. The host country's skilled wage is an increasing function of  $M$  if  $(b - \beta) > 0$ , a decreasing function of  $M$  if  $(b - \beta) < 0$ , and is independent of  $M$  if  $(b - \beta) = 0$  (Borjas 1999a).<sup>22</sup> Intuitively, if  $(b - \beta) > 0$ , immigrants are less skilled than natives: thus the relative supply of skilled to unskilled labor decreases with the inflow of foreigners and the skilled wage increases. If  $(b - \beta) < 0$ , skilled labor becomes relatively less scarce after immigration and the rate of return to skill decreases. Finally, if  $(b - \beta) = 0$ , immigration-induced changes in factor supplies do not alter the skill composition of the labor force in the destination country and the structure of factor returns stays the same.

Each individual  $l$  is either skilled or unskilled. His indirect utility function is given by  $v_l(p_1, p_2, y_l)$ , where  $y_l = w_j + r \cdot k_l$ ,  $j = S, U$ , represents income. If individuals care only about economic self-interest, preferences on immigration policy are determined by the sign and magnitude of the derivative  $\frac{dv_l}{dM}$ . Given the assumption of small open economy and international mobility of capital, immigration attitudes will only depend on immigration-induced changes in skilled and unskilled wages.<sup>23</sup> If production is diversified and the immigration shock is sufficiently small, skilled and

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<sup>20</sup>The case when both goods are produced is such that the number of primary factors of production (excluding capital, which is internationally mobile) is no greater than the number of goods.

<sup>21</sup>The intuition about the first condition is that, with only one equation in (1), the full-employment conditions are now necessary to pin down factor prices. The intuition about the second condition is that the equations of system (1) have now changed (some of them correspond to different goods).

<sup>22</sup>In particular, the changes of the skilled and unskilled wage given an inflow of immigrants  $dM > 0$  are respectively equal to (assuming  $dr = 0$ ):  $\frac{dw_S}{dM} = w_S \frac{\alpha_U}{(\alpha_S + \alpha_U)} \frac{1}{N} \frac{(b - \beta)}{b(1 - b)}$  and  $\frac{dw_U}{dM} = -w_U \frac{\alpha_S}{(\alpha_S + \alpha_U)} \frac{1}{N} \frac{(b - \beta)}{b(1 - b)}$ , where  $\alpha_i$  is the share of national income accruing to factor  $i$  and  $M = 0$  at the beginning of the period. These formulas correspond to Borjas's (1999a) results in the case of a Cobb-Douglas production function. They assume that unskilled (skilled) labor complements skilled (unskilled) labor and substitutes with other unskilled (skilled) labor.

<sup>23</sup>The hypothesis of small open economy implies  $\frac{dp_i}{dM} = 0$ ,  $i = 1, 2$ . I also assume that natives' individual factor endowments are not affected by immigration.

unskilled individuals should not differ in their preferences, since factor-price-insensitivity holds ( $dw_S = dw_U = 0$ ). The same prediction holds true if immigrants and natives have the same skill composition. In any other situation, we should observe a skill cleavage in individual attitudes towards immigrants: in countries characterized by high skill composition of natives relative to immigrants, skilled (unskilled) individuals should favor (oppose) immigration, while the opposite is true in countries with low relative skill composition of natives to immigrants.

### 3.2 Empirical evidence based on a *direct* measure of the skill composition of natives relative to immigrants

In the benchmark model of Tables 1a and 1b, I constrain the coefficients on individual characteristics to be equal for all countries in the samples. However, the impact of socio-economic and demographic variables on immigration attitudes is likely to differ across economies. I now take advantage of the panel-data structure of the two surveys and investigate cross-country heterogeneity of coefficients. I find that, while the effect of most variables does not vary, the impact of individual skill differs considerably across countries (see footnote 34 below).

The empirical analysis is guided by the theoretical results of the previous section. Given the assumptions of the model, I focus on two factors, skilled and unskilled labor and investigate whether the effect of individual skill on immigration attitudes takes place in labor markets. First, I empirically test the predictions of the factor-endowments models using a *direct* measure of the relative skill composition of natives to immigrants.<sup>24</sup> It is hard to construct such a direct measure, due to the scarcity of immigration data. For each receiving country, I need information on immigrants and their skill level and, in comparable terms, the same statistics on natives. The OECD (1997) International Migration Statistics (IMS-OECD) allow me to construct the relative skill composition measure for fourteen countries, all developed economies.<sup>25</sup> For each of these fourteen countries, the IMS-OECD statistics give figures on native and immigrant populations by ISCED level of education. However, only nine of these countries are included in the ISSP-NI data set (very few of them are present in the WVS).

Therefore the regressions in Table 2 are based on a smaller number of countries than in the full ISSP sample. The impact of individual skill on immigration preferences is modeled as a function of each country's relative skill composition of natives to immigrants by including in the empirical specification both the direct effect of individual skill and an interaction variable, *education\*relative skill ratio*. The *relative skill ratio* is the log of one plus the relative skill composition of natives to immigrants. For both natives and immigrants, the ratio of skilled to unskilled labor is measured as the ratio of the number of individuals with levels of education 2 and 3 to the number of individuals with level 1 of education (see footnote 13). The data used to construct this variable is for the stock of immigrants and natives in 1995 and comes from the IMS-OECD data (OECD 1997).<sup>26</sup>

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<sup>24</sup>The relative skill composition of natives to immigrants ( $\frac{b}{(1-b)}/\frac{\beta}{(1-\beta)}$ ) is the ratio of skilled to unskilled labor in the native relative to the immigrant populations. The theoretical predictions in footnote 22 are in terms of the difference  $(b - \beta)$ . But notice that  $\frac{b}{(1-b)}/\frac{\beta}{(1-\beta)} > 1$  if and only if  $(b - \beta) > 0$ .

<sup>25</sup>See footnote at the end of Figure 1 for a list of the fourteen countries.

<sup>26</sup>Due to unavailability of data on the skill composition of the *flow* of immigrants, I use the same type of information for the *stock* of immigrants. In other words, I adopt the same assumption as in Borjas (1999a)'s model: the skill

The results in columns (1) and (2) are consistent with the theoretical predictions in Section 3.1. They show that the relationship between the individual skill level and pro-immigration attitudes indeed depends on the *relative skill ratio*. Educated individuals are more likely to be pro-immigration if the latter variable is above a given threshold.<sup>27</sup> This result is consistent with the model's predictions since, the higher the relative skill composition of natives to immigrants, the smaller the ex-post relative supply of skilled to unskilled labor in the destination economy, and the higher (lower) the skilled (unskilled) wage. In addition, specification (3) shows that the cross-country skills-preferences pattern disappears once I restrict the sample to individuals out of the labor force.<sup>28</sup>

The following two regressions test a more restrictive hypothesis. Based on the models of Section 3.1, if the skill composition of immigrants exactly mirrors the human capital endowment of the native population ( $\beta = b$ ), there should be no effect of immigration on factor returns and, therefore, on preferences. If instead natives are more (less) skilled than immigrants, the relative supply of skill will be lower (higher) ex-post and real rates of return to skilled labor will be higher (lower). In column (4), SN (skilled natives) is an indicator variable for whether the ratio of skilled to unskilled labor for natives is greater than for immigrants; SM (skilled immigrants) is an indicator for the opposite situation.<sup>29</sup> In other words, these two variables are constructed using the cut-off point equal to one for the relative skill composition. In the estimates of column (4), as expected in the theoretical models, the marginal effects of the two interaction variables which include SN and SM are respectively positive and negative.<sup>30</sup> If natives are more skilled than immigrants (SN=1), the impact of years of education is positive and bigger in magnitude the more different the two groups are in terms of skill composition. If immigrants are more skilled than natives (SM=1), then (setting aside the direct effect of individual skill) more educated individuals are less likely to be pro-immigration, with the latter effect becoming stronger as the disparity in skill ratios widens. Finally, the marginal effect of years of education by itself, positive and significant at the 1% level, contradicts one of the predictions of the factor-endowments models. There should be no effect of immigration on wages and, therefore, on preferences if the skill compositions of immigrants and natives are the same. It is possible that the result depends on the effect of education working through non-economic channels, as discussed below.

To summarize, for the sample of OECD countries on which Table 2 is based, the results are supportive of the factor-endowments predictions. The correlation between immigration preferences and individual skill is consistent with the immigration-induced change in the host country's relative supply of skilled to unskilled labor. In particular, the results for this group of developed countries

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composition of immigrants is assumed not to change over time.

<sup>27</sup>Columns (1) and (2) assume that individuals across countries think of an increase in the number of immigrants in equal percentage terms, relative to their country's population ( $\frac{dM}{N}$ ).

<sup>28</sup>I will discuss this test more at length in section 3.3, where it is run on a larger number of countries. In Table 2, the out-of-the labor force subsample excludes housewives (men) in home duties, as I find that they behave as if they were in the labor force. This is not surprising, given assortative matching of wives and husbands based on education.

<sup>29</sup>The countries with SN equal to 1 are: Germany, Great Britain, Austria, Netherlands, Sweden, Canada, France (not in ISSP-NI), Denmark (not in ISSP-NI), Belgium (not in ISSP-NI), Finland (not in ISSP-NI). The countries with SM=1 are: Italy, Ireland, Spain, Portugal (not in ISSP-NI).

<sup>30</sup>The two interaction variables are, respectively,  $education*SN*(RSC-1)$  and  $education*SM*(1-RSC)$ , where  $RSC$  is the relative skill composition.

are in line with both the predictions of the HO model without factor-price-insensitivity and of the FPA model. They are not consistent, however, with an HO model in which changes in factor endowments do not trigger changes in factor prices and where only Rybczynski effects occur.

### 3.3 Empirical evidence based on an *indirect* measure of the skill composition of natives relative to immigrants

The results in Section 3.2 are based on a *direct* measure of the relative skill mix of natives to immigrants for a restricted sample of countries. I next use an *indirect* measure - the (log) per capita GDP of the destination country (*gdp*) - which allows me to broaden the analysis to the full ISSP sample and to test the robustness of the results using the WVS.

Per capita GDP is thought to be a good proxy for a country's human capital endowment. However, according to the models in Section 3.1, the (ex-ante) skill composition of the destination country's labor force by itself does not pin down the sign of the relationship between individual skill and preferences. *Ceteris paribus*, in countries with equal endowments of human capital, skilled individuals may have different attitudes towards immigrants, depending on the skill composition of such foreign workers. In other words, it is the skill composition of natives relative to immigrants which matters.

In a very simple one-sector model where countries share the same production function, economies with higher ratios of skilled to unskilled labor (high per capita GDP countries) have lower rates of return to skilled labor and higher rates of return to unskilled labor. The opposite is true for countries with low values of the skill ratio (low per capita GDP countries). Labor flows are driven by differences in real rates of return to factors. Therefore, in this simple model, skilled labor tends to move from high to low per capita GDP countries and, unskilled labor, in the opposite direction. Based on such simplifying assumptions, it is possible to predict the skill composition of immigrants (relative to natives as well), as a function of per capita income of the destination country.

However, taking into account cross-country differences in technology levels complicates the theoretical predictions. In richer countries rates of return can be higher than in the rest of the world for all factors, making it difficult to guess the skill composition of the immigrant workforce.<sup>31</sup>

The link between per capita GDP and the relative skill mix of natives to immigrants is therefore an empirical question. Based on the fourteen countries for which data is available, the simple correlation between per capita GDP and the relative skill composition of natives to immigrants is equal to 0.6120 (significant at the 1.53% level). A simple scatterplot of this correlation, in Figure 1, shows that it is not driven by outliers.

It is important to check that inferences are robust to the variable switch before broadening the sample. Regression (6) in Table 2 replicates the results of column (1) for the restricted sample of countries using per capita GDP rather than the skill-mix measure. In regression (7), which controls for both interaction terms *education\*gdp* and *education\*relative skill ratio*, only the marginal effect on the latter variable is significant. This suggests that per capita GDP is indeed capturing the effect of the relative skill composition of natives to immigrants.

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<sup>31</sup>Davis and Weinstein (2002) stress the same point when they notice that all factors (unskilled labor, skilled labor and capital) are characterized by positive net inflows into the United States.

My first set of results using the full sample of countries is based on estimating separately probit models for each economy. The country-specific regressions reveal a great deal of cross-country variation in terms of the correlation between skill and attitudes. Figures 2a, 3a and 3b summarize the evidence across countries. Figure 2a for the ISSP-NI sample presents the country-specific marginal effect of years of education on pro-immigration preferences (y axis) as a function of per capita GDP of the destination economy (x axis).<sup>32</sup> Figures 3a and 3b for the WVS data set are similarly constructed.<sup>33</sup> All three graphs show a positive relationship between per capita GDP of the host economy and the size of the country-specific impact of individual skill on attitudes in favor of foreigners.

I can gain additional insight on this pattern by, again, pooling all countries together in a single regression. As before, I use per capita GDP as an indirect measure of the relative skill composition of natives to immigrants. Specifically, I include in the model specification both the direct effect of individual skill and an interaction variable, *education\*gdp*, which is the product of the education measure times each country's (log) per capita GDP in 1995 (in international dollars). Column (1) of Table 3a presents the marginal effects of this specification, estimated using the ISSP-NI data set. I find strong evidence of a reversal in the impact of the individual skill level on immigration preferences. Individual skill appears to be positively correlated with pro-immigration preferences in high per capita GDP countries and negatively correlated with pro-immigration preferences in low per capita GDP countries.<sup>34</sup>

In particular, the estimates for *years of education* (-0.0454, significant at the 1% level) and *education\*gdp* (0.0054, significant at the 1% level) imply that any country with per capita GDP in 1995 (PPP-adjusted) lower than approximately \$4480 is characterized by a negative correlation between skill and pro-immigration preferences, while individuals from countries with per capita GDP above this threshold are more likely to be in favor of immigration the more educated they are. In Germany, for example, one more year of education increases the likelihood of being pro-immigration by approximately one percentage point, while in the Philippines one more year of education decreases the probability by 0.1 percentage points. These results are consistent with the empirical regularity uncovered by the country-specific regressions and summarized in Figures 2a, 3a, 3b. In addition, I will show that these findings are very robust, using various specifications and different skill measures, in both the ISSP-NI and WVS samples (see Table 3a, based on the ISSP-NI data set, and Table 3b, based on the WVS).

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<sup>32</sup>I estimate a separate probit model for each country. In Figure 2a the y axis measures the country-specific estimated marginal effect of years of education on the probability of being pro-immigration, holding all other regressors at their mean value. The regressors of each probit model are *age*, *male*, *parents' foreign citizenship*, *education*, *pro-immig crime* and *pro-immig culture*.

<sup>33</sup>In both Figures 3a and 3b, the y axis measures the country-specific estimated marginal effect of the highest education level attained on the probability of being pro-immigration, holding all other regressors at their mean value. The regressors include *age*, *male*, *country of birth*, *upper social class*, *political affiliation with the right*, *education*. The first graph refers to the whole sample of countries, the second one only to countries with 1995 per capita GDP (PPP) less than 15,000 international dollars.

<sup>34</sup>On the other hand, with the ISSP-NI data the correlation between immigration attitudes and, respectively, age, gender, parents' foreign citizenship, real income is not significantly different across countries, when I use per capita GDP (in 1995, PPP-adjusted) as a summary measure of each country. Only the impact of political affiliation with the right varies according to the level of national income.

I first question whether the coefficient on schooling is really capturing the impact of individual skill, i.e. whether the estimated effect is working through the labor market. Both skill measures (*years of education* and *educational attainment*) are likely to be correlated with individual characteristics which have an impact on immigration preferences. Such omitted variables could bias the estimates and drive the main result. To (partly) address this problem, in regressions (2)-(5) in Table 3a I include additional controls, relative to the core specification of column (1). In regression (2), the inclusion of the variable *political affiliation with the right* does not considerably affect the main cross-country pattern. The likelihood of being pro-immigration still increases with education in high per capita GDP countries, but it decreases with education if the destination economy is poor.

This finding does not change after controlling for the (log of) individual real income in column (3). The impact of the latter variable is not significant and does not alter considerably the main result. This rules out the possibility that the education measure is only picking up the effect of economic status. In addition, by controlling for total individual income, I can in part account for ownership of other factors of production owned by the respondent, like capital.<sup>35</sup> I also check whether the non-linearity in the impact of education is driven by the reversal of the effect of individual income. I find no evidence of this in regression (4), which shows that it is the impact of education, and not of income, that is non-linear and significant. Since individual contributions to and benefits from the welfare state are usually proportional to individual income, results in columns (3) and (4) are also evidence against a welfare-story explanation of attitudes.

I further investigate the possibility that the effect of education is working through channels other than the labor market. In the ISSP-NI data set, I systematically test the robustness of the results based on years of education by controlling for the following two regressors: *pro-immig crime*, which represents the respondent's perceived impact of immigration on crime rates and *pro-immig culture*, which quantifies the respondent's perceived cultural effect of immigration. Security issues and cultural considerations are likely to be among the most important non-economic determinants of preferences which are affected by schooling. By comparing two individuals who feel the same in terms of these issues, I hope to better isolate the economic channel, which links individual skill to immigration preferences through the labor market. The results in regression (5), which controls for *pro-immig crime* and *pro-immig culture*, still show the same pattern as in column (1): better skilled individuals are more likely to be pro-immigration in richer countries, and less likely in poorer countries.

To gain more evidence on whether the impact of schooling is indeed working through the labor market, I next follow Scheve and Slaughter (2001b) in running two separate regressions, one for the subsample of individuals who belong to the labor force and the other for those who do not.<sup>36</sup> I expect to see no effect of education for individuals out of the labor force if the correlation between schooling and preferences is in fact driven by labor-market causes.

The estimates in regressions (6)-(7) confirm that the impact of education on immigration atti-

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<sup>35</sup>The two data sets do not contain direct information on individual capital ownership.

<sup>36</sup>The labor force subsample includes individuals who are full-time employed, part-time employed, less than part-time employed (main job); unemployed. The out-of-the labor force subsample includes individuals who are retired; housewives (men), in home duties; permanently disabled, sick; others, not in labour force, not working. I exclude students from the sample since their number of years of education does not reflect their expected future skill.

tudes is in fact related to the labor-market channel. Compared to the full sample (regression 5), the preferences-skill pattern is more pronounced in the labor-force subsample and, on the other hand, any correlation is absent (the estimates are considerably smaller and not significant) in the group of individuals out of the labor force.

In Figure 2b, I use data from the ISSP-NI data set and I draw regression lines as in Figures 2a, 3a and 3b. The regression lines in Figure 2b refer to the two subsamples of individuals who, respectively, are and are not in the labor force. In particular, after dividing the sample into the two groups, I separately estimate the country-specific marginal effect of years of education on pro-immigration preferences for the subsample of individuals who are in the labor force and, next, for the subsample of individuals outside the labor force. Each line in Figure 2b gives the fitted values of the regression of these marginal effects on per capita GDP in 1995. Figure 2b clearly shows that the correlation between the impact of skill on attitudes and the country’s level of per capita income disappears for individuals outside the labor force. This is another piece of evidence in favor of the labor-market interpretation of the cross-country pattern.<sup>37</sup>

In column (8), in place of years of education, I employ a different indicator of skill, *skillISCO*, which is constructed with individual occupation data based on the 1988 ISCO classification.<sup>38</sup> *skillISCO* exploits the skill information provided by such classification. It is a particularly good-quality indicator of individual skill since, in addition to formal schooling, it captures the role of on-the-job training and of the nature of the work (O’Rourke and Sinnott 2001). Using *skillISCO* and its interaction with each country’s (log) per capita GDP in 1995, I find evidence of the same pattern as before. The empirical regularity is also robust to excluding from the sample the only developing country in the ISSP-NI data set (the Philippines) in column (9) and to dropping observations from low-income countries (Poland, Bulgaria, Russia, Philippines, Latvia) in column (10). Finally, my estimates do not change considerably (not shown) when I control for *pro-immig economy*, which measures the impact of immigration on the country’s economy, as perceived by the individual. Economy-wide benefits and costs of immigration appear to be important, but they do not drive the results on individual skill.

The results from Table 3b, which are based on the WVS figures, confirm the strength of the main result found with the ISSP-NI data set. I use survey questions to construct four different measures of individual skill: the highest education level attained by the individual, the age at which the respondent has completed education, and two skill measures based, respectively, on occupation data for the individual and for the chief-wage-earner in the household. Using any of the four indicators of skill, the impact of education on immigration preferences once again is positive for high-income countries and negative for low-income countries. In addition the cross-country pattern in skill cleavages once again disappears for individuals out of the labor force. Hence, Table 3b suggests that the previous estimates are not driven by the particular sample of countries there

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<sup>37</sup>The dependent variable of the regressions in Figures 2a, 2b, 3a, 3b is a generated regressand. I therefore use robust standard errors to correct for heteroskedasticity. I obtain very similar estimates if I use weighted least squares, with weights equal to the inverse of the standard errors of the estimated country-specific marginal effects.

<sup>38</sup>The idea to construct this measure using the ILO’s 1988 ISCO coding scheme comes from O’Rourke and Sinnott (2001), who use the same ISSP-NI data set in their analysis of trade policy preferences. Each 1988 ISCO occupation is matched with one of four skill levels, which are defined according to the level of education and to the extent of informal training and experience required to perform a job.

considered. Indeed, the WVS data set mostly includes developing countries and thus complements the ISSP-NI sample.

To summarize, the results based on per capita GDP are consistent with what I found using a direct measure of the relative skill composition of natives to immigrants. They confirm a role for labor-market determinants of immigration preferences along the lines of the factor-endowments models. For the sample of countries analyzed in the previous section, the evidence is consistent with the predictions of the HO model without factor-price-insensitivity and of the FPA model. For all the other countries, mostly middle and low-income economies, the interpretation of the skill-attitudes pattern based on per capita GDP depends on whether there is any immigration at all to such destinations and, if so, which type of immigration in terms of skill composition. It is plausible to extend the interpretation based on the HO model without factor-price-insensitivity and on the FPA model to countries with sizeable immigration intakes. On the other hand, in countries characterized by small immigration numbers, the factor-price-insensitivity result may hold.<sup>39</sup>

If there is indeed immigration to middle and low-income countries, the next step is to investigate which type of immigration, whether skilled or not. The positive correlation with per capita GDP suggests that the relative skill composition of natives to immigrants would be lower for poorer destination countries. Only if this is true, is the negative relationship between pro-immigration preferences and individual skill in lower-income countries consistent with the predictions of the factor-endowments models.

Unfortunately, the empirical evidence on size and skill composition of immigration to developing countries is now very scarce. Very few sources in the literature document the extent of immigration to these destinations.<sup>40</sup> One of them, the International Labor Migration Database (ILO 1998), shows that immigrants' flows to lower-income destinations exist and are sometimes substantial in magnitude (however, this data cannot be used, due to the low degree of harmonization across countries). As for the skill composition of immigration to developing countries, preliminary evidence suggests that it might be consistent with the results of this paper.<sup>41</sup> Future empirical work on this point should focus on the worldwide increase in short-term mobility of highly-skilled workers, due to the reduction in international business travel and communication costs (Tang and Wood 2000), and on medium and long-term flows of skilled labor linked to FDI into low per capita GDP countries.

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<sup>39</sup>The factor-price-insensitivity interpretation may apply to those countries whose marginal effect of skill is estimated to be not significantly different from zero. Unfortunately, these are also the countries for which reliable data on immigration flows is not available.

<sup>40</sup>These sources include: Jenks (1992), SOPEMI (1997), OECD (2000), Freeman (1995).

<sup>41</sup>SOPEMI (1997) documents the following: "Several developing South-East Asian countries have emerged as both sending and receiving countries for skilled and unskilled workers....China, which is experiencing shortages of highly skilled labour and which is now receiving important inflows of foreign direct investment, counted roughly 80,000 foreign workers in 1995, one third of whom were from Japan, 20 per cent from the United States and 13 per cent from Germany." (p.48). According to the same source, Central and Eastern European countries - such as Bulgaria, the Czech and Slovak Republics, Hungary, Poland and the former Soviet Union - have become in the nineties a new destination of immigration flows. Remember also that what matters in the model is the *relative* skill composition of natives to immigrants and that the average skill level of natives in lower-income countries is generally low.

### 3.4 Empirical Evidence based on Individual-level Data on Occupation

I use individual-level data on occupation to further test the robustness of the factor-endowments explanation (regressions (11) and (12), Table 3a). Specifically, I match each individual with the number of immigrants relative to natives in his occupation and I interpret each occupation as a different factor of production. I can then use the predictions of the multi-factor version ( $m > n$ ) of the factor-endowments models. If an occupation has a higher ratio of immigrants to natives than average it means that, due to immigration, it has experienced a bigger increase in supply relative to other occupations. Therefore, according to a factor-endowment story, individuals in such occupations will be less likely to be pro-immigration. In this framework, skilled and unskilled labor are considered as many different factors as the number of occupations in which they are employed.

In particular, in regression (11) I look at the relationship between immigration preferences and the immigrants-to-natives ratio of the individual's occupation (*IN ratio*), including among the regressors the usual socio-economic controls (*age, male, parents' foreign citizenship, education*). I find that, in occupations characterized by higher fractions of foreigners relative to natives, individuals are more likely to be anti-immigration. The marginal effect of the *IN ratio* is negative and significant at the 1% level.<sup>42</sup> I also compare the two versions of the factor-endowments models (regression (12)). This allows me to investigate which time horizon - short-run or long-run or both - is most important for individuals when they assess immigration policy. The multi-factor version provides a short-run view of the labor market since it assumes that individuals on average are not able to move from one occupation to the other. Therefore immigrants only affect the real rates of return of the occupations they take up and, therefore, the preferences of individuals working in the same activity. On the other hand, the  $3 \times 2$  factor-endowments models are based on a long-run view of the economy, since skilled and unskilled labor are supposed to be free to move across occupations and equalize real rates of return. I find that the most relevant time horizon is a long-run one, in which the perceived effect of labor inflows is on national labor markets of skilled and unskilled labor.

## 4 Non-Economic Determinants of Individual Attitudes

Up to now, the analysis has focused on economic determinants of immigration policy attitudes. I next investigate *correlation* patterns between attitudes towards immigrants and individual answers to questions about non-economic issues. The inclusion in the empirical model of these regressors allows me to test the robustness of the economic results.

Both security worries and cultural and national-identity issues are key non-economic factors affecting immigration opinions (see *pro-immig crime* and *pro-immig culture* in column (5)-(7), Table 3a). Security concerns are related to the perception that immigrants are more likely than natives to be involved in criminal activity. An interesting question is whether this belief is linked to an objective situation – due for example to a negative selection of immigrants to some countries, driven by the type of immigration policy – or whether it is due to racist and intolerant feelings,

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<sup>42</sup>The result in regression (11) is robust to adding two additional controls, *Immig Crime* and *Immig Culture*.

although I cannot distinguish these causes in the data.

Cultural and national-identity issues are related to the intrinsic side effect of immigration: the meeting, which often becomes a clash, of people of different ethnic origins and cultures.<sup>43</sup> The integration of immigrants in the destination society may be perceived as a source of enrichment on both sides. On the other hand, immigration may feed cultural and national-identity worries, driven by the belief that the set of values and traditions that characterize the receiving country’s society are threatened by the arrival of foreigners. At the extreme, this type of concerns may just be the consequence of the dislike of anything which is different, that is, cultural and racial intolerance.

A few survey questions in the ISSP-NI data set, combined with external data on origin and destination countries of immigrants, allow me to further investigate the role of cultural and national-identity issues. I investigate two dimensions: first, the individual preference for a culturally homogeneous society, which I call *monoculturalism*, as opposed to a multicultural community, labeled *multiculturalism*; second, whether immigrants adapt successfully in the destination country’s society or not. The latter is a function of how much immigrants and natives are culturally different. I use information on the five main countries of origin of foreigners for each host country to construct measures of cultural dissimilarity between natives and immigrants.

As expected, I find that individuals with a taste for multiculturalism are more likely to be pro-immigration, while the opposite is true for respondents with a preference for a more homogeneous society, in terms of customs and traditions (column (1), Table 4). I next investigate how these two variables – *monoculturalism* and *multiculturalism* – interact with the degree of cultural difference between natives and immigrants. I look at differences based on the main language spoken and on religious affiliation in the origin and destination countries and I explore the role of past colonial relationships. The only significant results of this analysis relate to dissimilarities in religious affiliation and are presented in regression (2), which contains the interaction terms between *religious difference* and, respectively, *monoculturalism* and *multiculturalism*.<sup>44</sup> I find that the marginal effect of *monoculturalism* does not change with religious difference. On the other hand, individuals with a taste for a multicultural society are negatively affected in their immigration opinion by bigger dissimilarities between natives and immigrants in religious terms.

The variables in column (3) also give information on cultural and national-identity issues. In particular, *national pride (2)* and *national pride (3)*, which are negatively and significantly related to pro-immigration attitudes, quantify the extent of individual attachment to the nation, the latter indicator in a stronger form than the former one. The results from regression (3) are consistent with the intuition that individuals who feel closer to their country’s identity are more likely to be anti-immigration.<sup>45</sup> Column (4) in Table 1b, based on the WVS data set, reveals the same pattern: More patriotic and nationalistic individuals are less likely to be in favor of immigration.

I next look at the relationship between immigration preferences and individual feelings about

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<sup>43</sup> “In Adam’s Smith’s words ‘man is of all sorts of luggage the most difficult to be transported.’” (Chiswick and Hatton 2002, p.1)

<sup>44</sup> The variable *religious difference*, which measures the dissimilarity between natives and immigrants in terms of religious affiliation, is an average across origin countries of the dissimilarity measure  $\frac{1}{2} \sum_{r=1}^R |p_r^D - p_r^O|$ , where  $D$  and  $O$  are for destination and origin country and  $p_r$  represents the fraction of the population in religion  $r$ .

<sup>45</sup> This confirms one of the main results in Espenshade and Hempstead (1996) about the link between immigration preferences and isolationist feelings.

illegal immigration and political refugees (regression (4), Table 4). Both variables have the expected sign and are highly significant. Individuals who are against illegal immigration and who do not welcome political refugees are also more likely to oppose an increase in immigration. On the other hand, the same regression suggests that whether an individual belongs to the dominant ethnic group in society does not have a significant impact on opinions about foreigners.

Finally, in the last column of Table 4, I put together all the main factors shaping immigration attitudes into a single specification. By combining both sets of variables, economic and non-economic ones, I can investigate how robust my previous findings are. The picture of individual preferences that emerges from this final set of results is multi-faceted. Both economic and non-economic indicators appear to be important. But, in particular, regression (5) shows that the cross-country pattern in the correlation between preferences and skill – which is evidence of labor-market determinants – is still present when I control for the non-economic variables. This result remains robust when I use the WVS data set.

As mentioned before, intolerance on the basis of race may explain a lot of the variation in immigration preferences and may be the driving force behind other types of explanations. The WVS data set includes a question that allows me to construct a measure of racist feelings. Using such measure, I find that racism is indeed highly correlated with anti-immigration feelings. A respondent who would rather not have as neighbors individuals of a different race is more than eight percentage points less likely to be in favor of an increase in immigration. However, the cross-country pattern in the correlation between skill and preferences is almost unaffected by the inclusion of the racism variable. Labor-market based explanations survive this robustness test (results not shown).

## 5 Concluding remarks

In this paper I find evidence that both economic and non-economic factors are important in explaining immigration attitudes. In a wide range of countries, attitudes towards immigrants appear to be related to labor-market concerns, security and cultural considerations, as well as individual feelings towards political refugees and illegal immigration. In particular, my analysis shows that the labor-market variables continue to play a key and robust role in preference formation over immigration policy, after controlling for non-economic factors. My results, therefore, reject a view of the world in which only non-economic issues shape attitudes towards foreigners.

In particular, I find that opinions about immigration policy are significantly correlated with individual skill and that there exists substantial cross-country variation in terms of this correlation. The evidence in this paper is consistent with a labor-market interpretation of the skills-preference pattern across countries. My first set of results is based on a restricted sample of countries, due to data limitations. The cross-country variation in the correlation between skill and preferences appears to be related to differences in the skill composition of natives relative to immigrants across destination economies. Skilled individuals are more (less) likely to be pro-immigration in countries where the relative skill composition of natives to immigrants is high (low). I next use an *indirect* measure of the relative skill composition of natives to immigrants, per capita GDP, which allows me to look at a broader sample of countries. I find that individual skill is positively correlated with

pro-immigration preferences in high per capita GDP countries and negatively correlated with pro-immigration preferences in low per capita GDP countries. This result is robust to various changes in the empirical specification and to the use of two different data sources. Overall my results are consistent with the labor-market predictions of the Heckscher-Ohlin model, without factor-price-insensitivity, and of the factor-proportions-analysis model. In addition, individual-level data on occupation provides more evidence in favor of the factor-endowment interpretation. Individuals in occupations with a higher ratio of immigrants to natives appear to be more likely to oppose immigration.

Non-economic variables also are found to be significantly correlated with immigration policy preferences. Both concerns regarding the impact of immigration on crime rates and individual perceptions of the cultural effect of foreigners are found to covary with immigration attitudes. In addition, racist feelings have a very strong, negative and significant impact on pro-immigration preferences. However, these non-economic determinants do not seem to alter significantly the results regarding the economic variables. Labor-market explanations of attitudes towards foreigners survive, after taking into account these non-economic factors.

To conclude the analysis on individual immigration attitudes, I investigate the relative importance of economic considerations relative to non-economic ones, based on the specification of the model which includes all the main variables. I estimate a linear (OLS) regression using the five-valued *Immig Opinion* as the dependent variable. I start with a specification which only includes the non-economic regressors (*age, male, parents' foreign citizenship, monoculturalism, multiculturalism, national pride (2), against illegal immigrants, in favor of political refugees, pro-immig crime*, plus dummy variables). I next add the economic variables (*education, education\*gdp, log of real income, pro-immig economy*). The difference between the two  $R^2$  measures ( $0.3946-0.3339=0.0607$ ) is the fraction of the total variance which is explained by economic factors, after accounting for the contribution of non-economic determinants. If I repeat the same exercise including first the economic variables plus dummy variables, and next the non-economic regressors, the  $R^2$  increases by 0.1538. Therefore, while this paper rejects a view of the world where only non-economic factors affect immigration preferences, it also finds that non-economic determinants are relatively more important than the economic variables considered, in terms of variance explained.

Finally, I look into what accounts for differences in *average* attitudes across countries.<sup>46</sup> Let's consider, for example, Canada and Hungary which, in terms of attitudes towards foreigners, are at the opposite extremes (see Appendix 1), with the former country much more open to immigration than the latter one. According to my model, some 17 percent of the difference between Canadians and Hungarians in terms of pro-immigration preferences is explained by the dissimilarity in the impact of individual skill (i.e., the combination of the difference in both average individual skill in each country and the country-specific marginal effect of skill), approximately 22 percent by the difference in the individual perception of the economy-wide benefits of immigration, around 4 percent by the difference in the percentages of individuals having parents with foreign citizenship, 8 percent by stronger feelings against illegal immigrants in Hungary relative to Canada and, finally, more than 7 percent by less sympathetic feelings towards political refugees in Hungary than in

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<sup>46</sup>This decomposition of the difference in *average* immigration attitudes across countries is based on a linear (OLS) specification using the five-valued *Immig Opinion* as the dependent variable. The regressors are the same as in the analysis of the relative importance of economic versus non-economic variables.

Canada. To conclude, approximately 14 percent of the difference is due to dissimilar perceptions of the link between immigration and crime rates (see Appendix 1). The rest is mostly explained by country dummy variables which account for around a quarter of the difference in average immigration attitudes between the two countries. Country fixed effects play an important role in terms of total variance explained by the model as well. The analysis below focuses on country dummy variables to further explain cross-country variation in average immigration attitudes.

Country-level variables, such as per capita GDP and the size of the immigrant inflow, cannot be included additively in the individual-level regressions together with country fixed effects (due to perfect multicollinearity).<sup>47</sup> Country dummy variables are necessary as, without them, coefficients on individual variables would be inconsistent due to unobserved country-specific effects. I use a two-step procedure to get around these problems. In the first stage, I estimate a linear specification with *Immig Opinion* as the dependent variable and, as regressors, the main economic and non-economic individual-level variables plus country fixed effects.<sup>48</sup> I next regress the coefficients of country dummy variables on country-level characteristics. In the second stage, given that the dependent variable is a generated regressand, I use weighted least squares (WLS) with weights equal to the inverse of the standard errors of the country-specific intercepts from the first stage (Goldberg and Pavcnik 2003). This empirical strategy assigns more weight to countries with smaller variance of the country fixed effect. My results are based on a restricted sample, for which data is available. I find that higher per-capita-GDP countries are on average less open to immigration, after accounting for the impact of individual-level variables. This result is not surprising given that, based on additional regressions, richer countries tend to have higher immigrant inflows and less skilled immigrants relative to natives; and countries with higher immigrant inflows and lower skill composition of immigrants relative to natives tend to be less pro-immigration on average. Finally, the size of inflows of asylum seekers too is associated with more negative average attitudes towards immigrants.

To conclude, immigration has become a central theme of political discussions in many countries. This paper has shed light on the economic and non-economic impact of immigration as perceived by individuals. Individual attitudes are necessarily a key input in policy outcomes and their viability. Therefore this work contributes to a better understanding of immigration-policy decisions and, as a consequence, of international migration flows.

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<sup>47</sup>On the other hand, country-level variables have been introduced in the regression model in interaction form with individual-level variables.

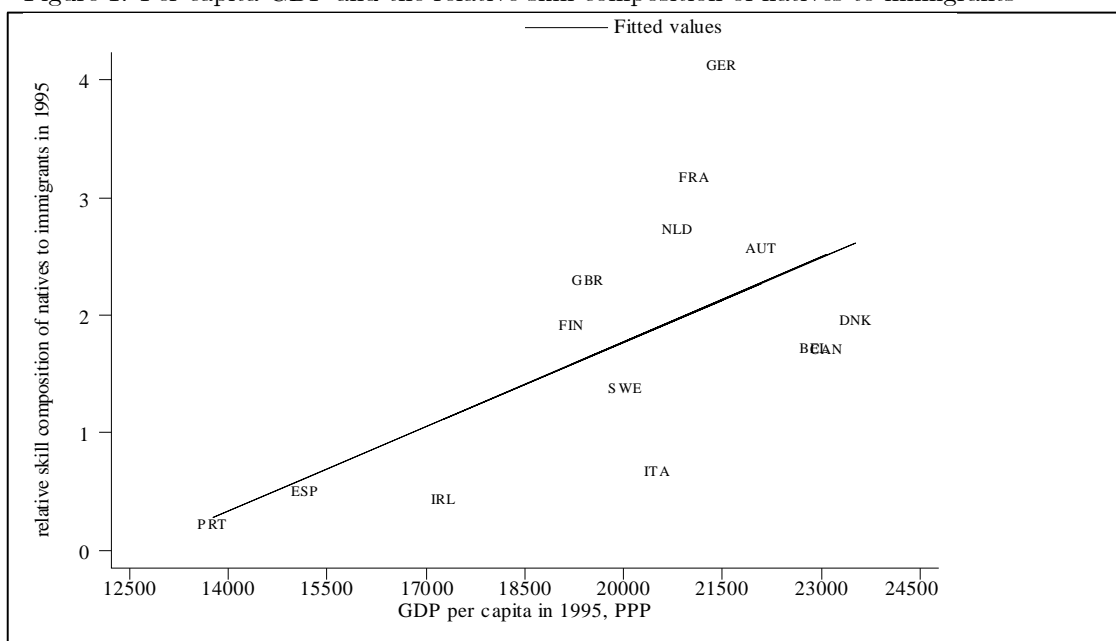
<sup>48</sup>I don't include *log of real income* and *against illegal immigrants* as they are not available for several countries.

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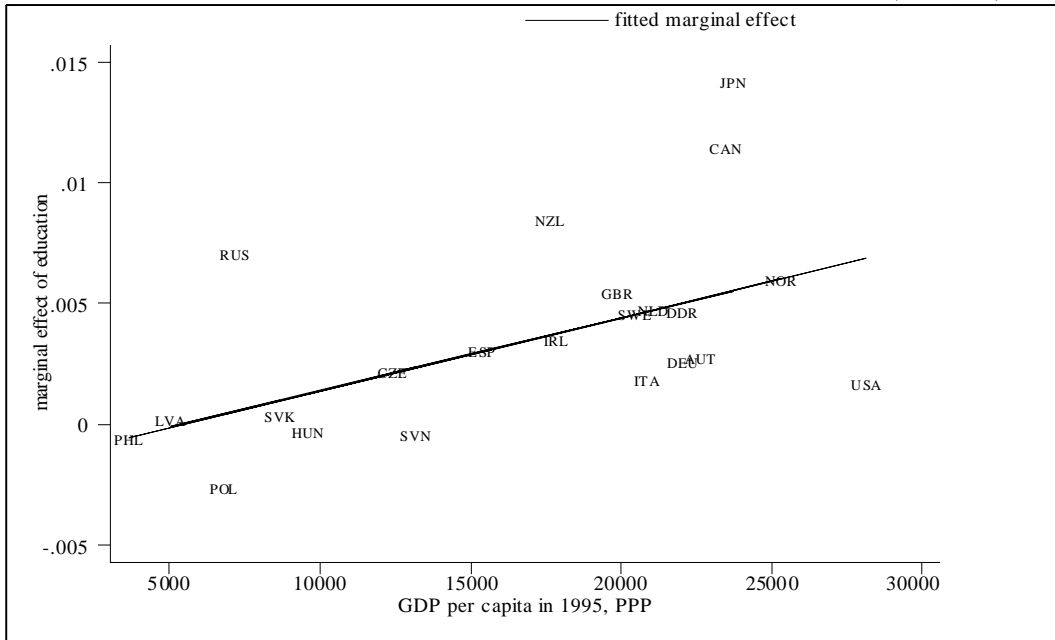
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Figure 1: Per capita GDP and the relative skill composition of natives to immigrants



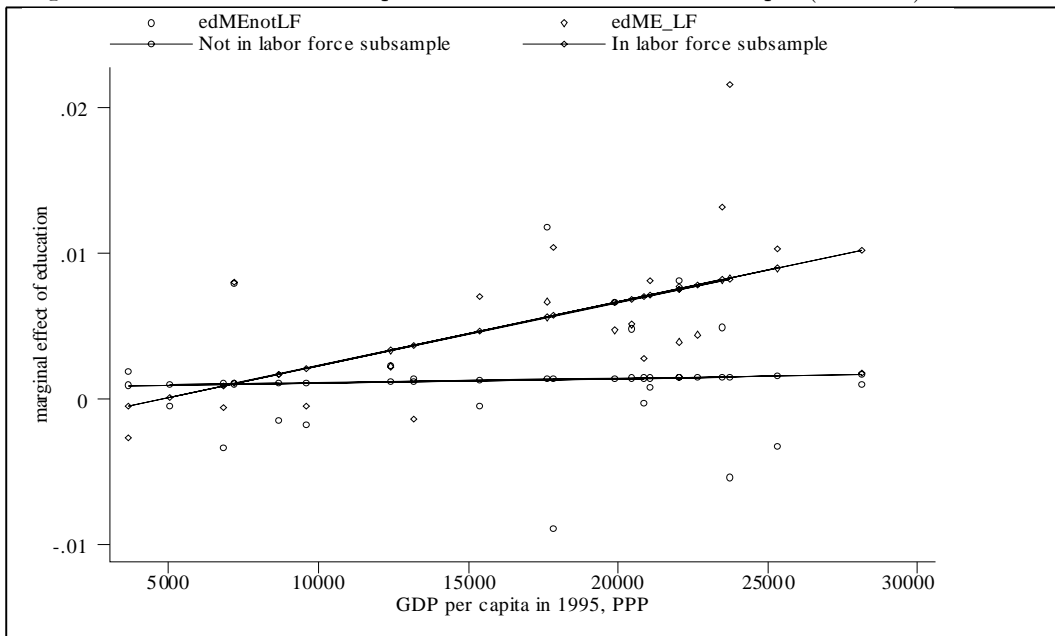
The coefficient of the fitted line is 0.0002393, significant at 1% (robust standard error: 0.0000567). The fourteen countries analyzed in this Figure are those with available data on the skill composition of natives relative to immigrants: Germany, Great Britain, Austria, Italy, Ireland, Netherlands, Sweden, Canada, Spain, Portugal, France, Denmark, Belgium, Finland.

Figure 2a: Country-specific impact of education on immigration attitudes (ISSP-NI)



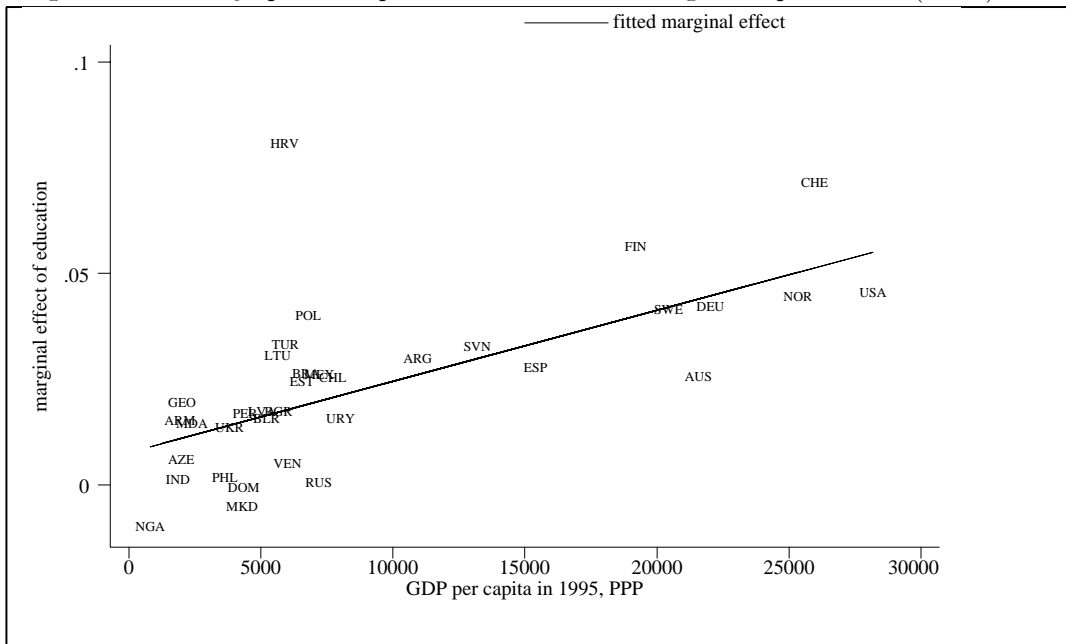
The coefficient of the line is  $3.02e-07$ , significant at 5% (robust standard error:  $1.15e-07$ ).  
See also footnote 32.

Figure 2b: Labor-force subsample vs. out-of-labor-force subsample (ISSP-NI)



not in LF: the coefficient of the line is  $2.82e-08$ , insignificant (robust standard error= $1.25e-07$ );  
in LF: the coefficient of the line is  $4.36e-07$ , significant at 5% (robust standard error= $1.73e-07$ ).

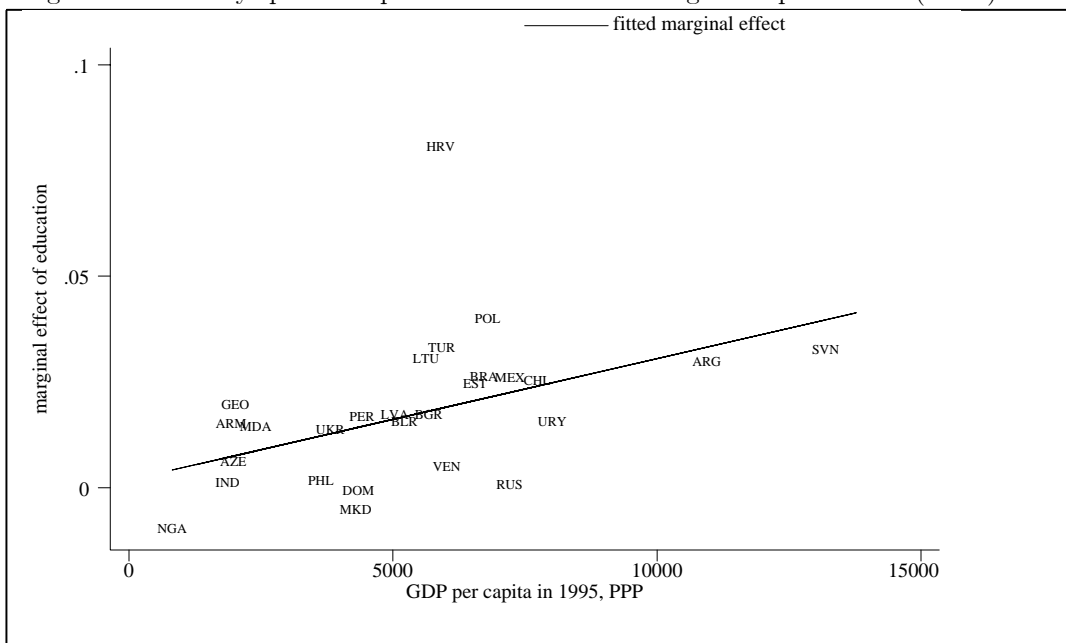
Figure 3a: Country-specific impact of education on immigration preferences (WVS)



This graph covers the whole sample of countries in the WVS. See also footnote 33.

The coefficient of the fitted line is  $1.68e-06$ , significant at 1% (robust standard error= $2.97e-07$ ).

Figure 3b: Country-specific impact of education on immigration preferences (WVS)



This graph covers lower-income countries in the WVS. See also footnote 33.

The coefficient of the fitted line is  $2.87e-06$ , significant at 1% (robust standard error= $6.76e-07$ ).

**Table 1a: Benchmark Model (ISSP-NI data set)**

Probit with country dummy variables	1	2	3	4
Dependent variable	Pro Immig Dummy			
<b>age</b>	-0.0003 0.0001*	-0.0004 0.0001**	-0.0005 0.0002*	-0.0002 0.0002
<b>male</b>	0.0122 0.0035**	0.0098 0.0042*	0.0086 0.0049	0.0136 0.0052**
<b>parents' foreign citizenship</b>	0.0237 0.0049**	0.0248 0.0056**	0.0249 0.0073**	0.0349 0.0082**
<b>education (years of education)</b>	0.006 0.0011**	0.0075 0.0012**	0.0064 0.0017**	0.0074 0.0015**
<b>log of real income</b>		0.0015 0.0038		
<b>political affiliation with the right</b>			-0.0113 0.0055*	-0.0165 0.0091
<b>rural</b>				-0.009 0.0038*
<b>upper social class</b>			0.0025 0.0038	
<b>trade union member</b>			0.0002 0.0059	
number of obs	21581	15001	8171	8420
Pseudo R-squared	0.1	0.12	0.11	0.08

**Table 1b: Benchmark Model (WVS data set)**

Probit with country dummy variables	1	2	3	4
Dependent variable	Pro Immig Dummy (WVS)			
<b>age</b>	-0.0016 0.0003**	-0.0017 0.0003**	-0.0017 0.0004**	-0.0015 0.0004**
<b>male</b>	0.009 0.0069	0.0059 0.0076	0.0044 0.0081	0.0111 0.0088
<b>upper social class</b>	0.012 0.0054*	0.0107 0.0062	0.0057 0.0068	0.0039 0.0067
<b>political affiliation with the right</b>	-0.0085 0.0027**	-0.0078 0.0028**	-0.0084 0.0027**	-0.0065 0.0028*
<b>education (educational attainment)</b>	0.0192 0.0036**	0.0176 0.0038**	0.0165 0.0041**	0.0152 0.0041**
<b>town size</b>		0.0051 0.0031	0.006 0.0030*	0.006 0.0032
<b>relative income</b>			0.0048 0.0024*	0.0058 0.0025*
<b>national pride (1)</b>				-0.0203 0.0081*
<b>national pride (2)</b>				-0.03 0.0108**
number of obs	36514	30829	26552	23243
Pseudo R-squared	0.07	0.06	0.06	0.07

The sample excludes all individuals who are not citizens of the country where they are interviewed. The table contains the estimated marginal effect on the probability of being pro-immigration, given an increase in the value of the relevant regressor, holding all other regressors at their mean value. Standard errors adjusted for clustering on country are presented under each marginal effect. \* significant at 5%; \*\* significant at 1%

*Male* is coded as follows: 1 male, 0 female (i.e., missing values are excluded). *parents' foreign citizenship* is coded as follows: 1=both parents are citizens; 2= only mother/father is citizen; 3=neither parents are citizens. *log of real income* is calculated using data in local currency on individual yearly income from the ISSP-NI data set and purchasing power parity conversion factors from the WDI (World Bank).

*political affiliation with the right* is coded as follows: 1=far left, 2=centre left, 3=centre, 4=right, 5=far right. *rural* is coded as follows: 1=urban, 2=suburbs/city-town, 3=rural. *upper social class* is coded as follows: 1=lower, 2=working, 3=lower middle, 4=middle, 5=upper middle, 6=upper. *trade union member* equals one if the individual is a member of a trade union, zero if he is not.

The table contains the estimated marginal effect on the probability of being pro-immigration, given an increase in the value of the relevant regressor, holding all other regressors at their mean value. Standard errors adjusted for clustering on country are presented under each marginal effect. \* significant at 5%; \*\* significant at 1%. The sample excludes all individuals who were not born in the country where they are interviewed.

*education* (the highest education level attained by the individual) is coded as follows: 1=no formal education; 2=incomplete primary school; 3=complete primary school; 4=incomplete secondary school (technical/vocational type); 5=complete secondary school (technical/vocational type); 6=incomplete secondary (university/preparatory type); 7=complete secondary (university/preparatory type); 8=some university-level education, without degree; 9=university-level education, with degree.

*upper social class* is coded as follows: 1=lower class, 2=working class; 3=lower middle class; 4=upper middle class; 5=upper class. *political affiliation with the right* is coded as follows: in order, from 1 (left-wing) to 10 (right-wing). *town size* is coded as follows: in order, from 1=under 2,000 to 8=500,000 and more. *relative income* is coded as follows: from 1=lowest decile in the country to 10=highest decile in the country. *national pride (1)* is coded as follows: 1=not at all proud to be (Italian, for example); 4=very proud to be (Italian, for example). *national pride (2)* is coded as follows: 1=if willing to fight in a war for one's own country; 0=if not willing.

**Table 2: Factor-Endowments Model: Empirical evidence based on a direct measure of the skill composition of natives relative to immigrants (ISSP-NI data set)**

Probit with country dummy variables	1	2	3	4	5	6	7
	<b>out of labor force</b>						
<b>Dependent variable</b>	<b>Pro Immig Dummy</b>						
<b>age</b>	-0.0005	-0.0003	-0.0002	-0.0005	-0.0003	-0.0005	-0.0005
	0.0002**	0.0001*	0.0001	0.0002**	0.0001*	0.0002**	0.0002**
<b>male</b>	0.0078	0.0107	0.0089	0.0078	0.0106	0.0087	0.0078
	0.005	0.0043*	0.0059	0.0049	0.0042*	0.0052	0.0049
<b>parents' foreign citizenship</b>	0.0163	0.01	-0.003	0.0163	0.01	0.0165	0.0163
	0.0052**	0.0046*	0.0043	0.0052**	0.0046*	0.0054**	0.0053**
<b>education (years of education)</b>	-0.0012	-0.002	-0.0008	0.0066	0.0035	-0.2191	-0.0245
	0.0012	0.0010*	0.001	0.0015**	0.0012**	0.0716**	0.0701
<b>education*relative skill ratio</b>	0.0099	0.0074	0.0022				0.0093
	0.0013**	0.0014**	0.0014				0.0022**
<b>education*gdp</b>						0.0229	0.0024
						0.0073**	0.0073
<b>education*SN*(RSC-1)</b>				0.0028	0.0023		
				0.0007**	0.0006**		
<b>education*SM*(1-RSC)</b>				-0.0077	-0.005		
				0.0031*	0.0025*		
<b>pro-immig crime</b>		0.0491	0.0286		0.0489		
		0.0064**	0.0042**		0.0064**		
<b>pro-immig culture</b>		0.0489	0.032		0.0487		
		0.0084**	0.0068**		0.0083**		
number of obs	10414	10414	2085	10414	10414	10414	10414
Pseudo R-squared	0.13	0.18	0.22	0.13	0.18	0.13	0.13

The sample excludes all individuals who are not citizens of the country where they are interviewed. The table contains the estimated marginal effect on the probability of being pro-immigration, given an increase in the value of the relevant regressor, holding all other regressors at their mean value. Standard errors adjusted for clustering on country are presented under each marginal effect. \* significant at 5%; \*\* significant at 1%.

The regressions are based on the following countries: Germany, Great Britain, Austria, Italy, Ireland, Netherlands, Sweden, Canada, Spain. These are the countries in the ISSP-NI sample for which direct data on the RSC is available.

*parents' foreign citizenship* is coded as follows: 1=both parents are citizens; 2= only mother/father is citizen; 3=neither parents are citizens. *Therelative skill ratio* is the log of one plus the relative skill composition (RSC). The RSC is the ratio of skilled to unskilled labor in the native relative to the immigrant populations. For both natives and immigrants, the ratio of skilled to unskilled labor is measured as the ratio of the number of individuals with levels of education 2 and 3 to the number of individuals with level 1 of education (see footnote \*). In order to get the semi-elasticity with respect to the RSC, one needs to multiply coefficients' estimates of the relative skill ratio by  $RSC/(1+RSC)$ . The RSC uses data on the stock of immigrants and natives in 1995. *SN* is an indicator variable of whether the ratio of skilled to unskilled labor in the native relative to the immigrant populations is greater than 1; *SM* is an indicator variable of the same ratio being less than 1. See Appendix 1 for the definition of *pro-immig crime* and *pro-immig culture*.

The *out-of labor force* subsample includes individuals who are retired; permanently disabled, sick; others, not in labour force, not working.

**Table 3a: Empirical evidence based on a indirect measure of the skill composition of natives relative to immigrants (ISSP-NI data set)**

Probit with country dummy variables	1	2	3	4	5	6	7	8	9	10	11	12
				in labor force		out of labor force		no Philippines		no low-income countries		
Dependent variable	Pro Immig Dummy											
<b>age</b>	-0.0003	-0.0005	-0.0004	-0.0004	-0.0002	-0.0001	-0.0002	-0.0005	-0.0003	-0.0004	-0.0004	-0.0005
	0.0001*	0.0002*	0.0001**	0.0001**	0.0001	0.0002	0.0001	0.0001**	0.0001*	0.0001**	0.0004	0.0004
<b>male</b>	0.0118	0.0095	0.0093	0.0093	0.0118	0.0089	0.0131	0.0101	0.0119	0.0107	-0.0019	-0.0029
	0.0035**	0.0046*	0.0044*	0.0044*	0.0029**	0.0042*	0.0035**	0.0038**	0.0036**	0.0041**	0.0132	0.0133
<b>parents' foreign citizenship</b>	0.023	0.0252	0.0242	0.0242	0.0157	0.0186	0.0096	0.0277	0.0224	0.023	0.0207	0.0194
	0.0049**	0.0060**	0.0055**	0.0055**	0.0043**	0.0056**	0.0042*	0.0043**	0.0048**	0.0050**	0.0097*	0.0089*
<b>education (years of education)</b>	-0.0454	-0.0496	-0.0703	-0.0765	-0.0345	-0.0411	-0.0067		-0.0561	-0.1002	0.0085	-0.3472
	0.0098**	0.0215*	0.0244**	0.0250**	0.0077**	0.0102**	0.0042		0.0172**	0.0420*	0.0022**	0.1017**
<b>education*gdp</b>	0.0054	0.0058	0.0079	0.0086	0.004	0.0048	0.0008		0.0064	0.0108		0.0362
	0.0011**	0.0023**	0.0025**	0.0026**	0.0008**	0.0011**	0.0005		0.0018**	0.0043*		0.0102**
<b>political affiliation with the right</b>		-0.015										
		0.0058**										
<b>log of real income</b>			0.002	0.0821								
			0.0038	0.0739								
<b>log of real income*gdp</b>				-0.0082								
				0.0076								
<b>pro-immig crime</b>					0.0472	0.0519	0.0266					
					0.0078**	0.0092**	0.0072**					
<b>pro-immig culture</b>					0.0509	0.0581	0.0324					
					0.0050**	0.0052**	0.0055**					
<b>skillISCO</b>								-0.1575				
								0.0601**				
<b>skillISCO*gdp</b>								0.0244				
								0.0080**				
<b>Immigrants/Natives ratio in occupation (IN ratio)</b>											-0.2705	-0.1432
											0.0606**	0.0895
number of obs	21581	12507	15001	15001	21581	13237	7264	12999	20487	17717	3421	3421
Pseudo R-squared	0.11	0.11	0.13	0.13	0.16	0.16	0.15	0.11	0.12	0.12	0.13	0.14

The sample excludes all individuals who are not citizens of the country where they are interviewed. The table contains the estimated marginal effect on the probability of being pro-immigration, given an increase in the value of the relevant regressor, holding all other regressors at their mean value. Standard errors adjusted for clustering on country are presented under each marginal effect. \* significant at 5%; \*\* significant at 1%

*parents' foreign citizenship* is coded as follows: 1=both parents are citizens; 2= only mother/father is citizen; 3=neither parents are citizens. *political affiliation with the right* is coded as follows: 1=far left, 2=centre left, 3=centre, 4=right, 5=far right. *gdp* is the log of per capita GDP in 1995, PPP (current international dollars). *log of real income* is calculated using data in local currency on individual income from the ISSP-NI data set and purchasing power parity conversion factors from the WDI (World Bank). See Appendix 1 for the definition of *pro-immig crime* and *pro-immig culture*. *skillISCO* equals one if the 1988 ISCO occupation code is 2 (legislators and managers), 3 (professionals) and 4 (technicians); it equals zero if the 1988 ISCO occupation code is 5 (clerks), 6 (service and sales workers), 7 (agricultural and fishery workers), 8 (craft and related trades workers), 9 (plant and machine operators) and 10 (elementary occupations). The *IN ratio* is equal to the log of one plus the ratio in 1995 of the number of foreigners to the number of natives in the individual's occupation (the data for immigrants and natives is for to the stock of immigrants and natives in 1995). Data on immigrants' and natives' occupations follows the 1988 ISCO classification. Regressions (6)-(7): The *labor-force* subsample includes individuals who are full-time employed, part-time employed, less than part-time employed (main job); unemployed. The *out-of-labor force* subsample includes individuals who are retired; housewives (men), in home duties; permanently disabled, sick; others, not in labour force, not working. I exclude students from the sample since their number of years of education does not reflect their expected future skill.

Regressions (11)-(12) are based on Germany, Great Britain, Austria, Ireland and Spain, for which there is data on individual occupation and on the immigrants-to-natives ratio by individual occupation.

**Table 3b: Empirical evidence based on an indirect measure of the skill composition of natives relative to immigrants  
(WVS data set)**

Probit with country dummy variables	1	2	3	4	5	6	7
		<b>in labor force</b>	<b>out of labor force</b>	<b>ISSP sample of countries</b>			
Dependent variable	<b>Pro Immig Dummy (WVS)</b>						
<b>age</b>	-0.0016	-0.0013	-0.0012	-0.0015	-0.0021	-0.0023	-0.0023
	0.0004**	0.0005**	0.0005*	0.0007*	0.0004**	0.0003**	0.0004**
<b>male</b>	0.0089	0.009	-0.0156	-0.0055	0.0059	0.003	0.0114
	0.0069	0.0096	0.0134	0.01	0.0069	0.0078	0.01
<b>upper social class</b>	0.0134	0.0155	0.0165	0.0164	0.0232	0.0154	0.0267
	0.0051**	0.0060*	0.0076*	0.0089	0.0061**	0.0057**	0.0079**
<b>political affiliation with the right</b>	-0.0082	-0.0086	-0.0088	-0.0132	-0.0093	-0.0073	-0.0087
	0.0028**	0.0031**	0.0039*	0.008	0.0031**	0.0034*	0.0035*
<b>education (educational attainment)</b>	-0.1163	-0.154	-0.0443	-0.1764			
	0.0172**	0.0125**	0.0384	0.0280**			
<b>education*gdp</b>	0.0157	0.02	0.0073	0.0217			
	0.0020**	0.0015**	0.0044	0.0031**			
<b>education age (age at which education completed)</b>					-0.023		
					0.0075**		
<b>education age*gdp</b>					0.003		
					0.0008**		
<b>individual skill (occupation-based individual skill)</b>						-0.0728	
						0.0190**	
<b>individual skill*gdp</b>						0.0094	
						0.0023**	
<b>cwe skill (chief wage earner's occupation-based skill)</b>							-0.0355
							0.0191
<b>cwe skill*gdp</b>							0.0048
							0.0023*
number of obs	33371	21047	8262	9966	29918	26371	14256
Pseudo R-squared	0.07	0.07	0.07	0.08	0.07	0.07	0.07

The table contains the estimated marginal effect on the probability of being pro-immigration, given an increase in the value of the relevant regressor, holding all other regressors at their mean value. Standard errors adjusted for clustering on country are presented under each marginal effect. \* significant at 5%; \*\* significant at 1%. The sample excludes all individuals who were not born in the country where they are interviewed.

*upper social class* is coded as follows: 1=lower class, 2=working class; 3=lower middle class; 4=upper middle class; 5=upper class. *political affiliation with the right* is coded as follows: in order, from 1 (left-wing) to 10 (right-wing). See footnote at the end of Table 1b for the definition of *education*. *education age* is the age at which the individual finished school. *individual skill* is coded as follows: 1=agricultural worker; 2=farmer (own farm); 3=unskilled manual worker; 4=semi-skilled manual worker; 5=skilled manual worker; 6=foreman and supervisor; 7=non manual-office worker (non-supervisory); 8=supervisory-office worker; 9=professional worker (lawyer, accountant, teacher, etc.); 10=employer/manager of establishment with less than 10 employees; 11=employer/manager of establishment with 10 or more employees. *cwe (chief wage earner in the household) skill* is coded in the same way as individual skill.

**Table 4: Non-Economic Determinants Model (ISSP-NI data set)**

Probit with country dummy variables	1	2	3	4	5
<b>Dependent variable</b>	<b>Pro Immig Dummy</b>				
<b>age</b>	-0.0002	-0.0003	-0.0001	-0.0003	-0.0002
	0.0001	0.0002	0.0001	0.0001**	0.0001*
<b>male</b>	0.0126	0.012	0.0117	0.0112	0.0107
	0.0033**	0.0066	0.0042**	0.0027**	0.0027**
<b>parents' foreign citizenship</b>	0.0238	0.0204	0.0218	0.0143	0.015
	0.0049**	0.0046**	0.0053**	0.0023**	0.0021**
<b>education (years of education)</b>	0.0052	0.0079	0.0053	0.0022	-0.0251
	0.0008**	0.0011**	0.0009**	0.0004**	0.0127*
<b>education*gdp</b>					0.0027
					0.0013*
<b>monoculturalism</b>	-0.0133	-0.0567			0.0011
	0.0062*	0.0254*			0.0028
<b>multiculturalism</b>	0.0325	0.2117			0.0203
	0.0063**	0.0629**			0.0042**
<b>monoculturalism*religious difference</b>		0.0385			
		0.0343			
<b>multiculturalism*religious difference</b>		-0.1266			
		0.0372**			
<b>national pride (1)</b>			-0.0022		
			0.0037		
<b>national pride (2)</b>			-0.011		-0.0054
			0.0019**		0.0017**
<b>national pride (3)</b>			-0.0061		
			0.0025*		
<b>national pride (4)</b>			-0.0046		
			0.0024		
<b>against illegal immigrants</b>				-0.0191	-0.0179
				0.0017**	0.0015**
<b>in favor of political refugees</b>				0.0194	0.0168
				0.0016**	0.0018**
<b>major ethnic group</b>				-0.0026	
				0.0059	
number of obs	21581	9667	18975	12419	14473
Pseudo R-squared	0.12	0.17	0.11	0.24	0.22

The sample excludes all individuals who are not citizens of the country where they are interviewed. The table contains the estimated marginal effect on the probability of being pro-immigration, given an increase in the value of the relevant regressor, holding all other regressors at their mean value. Standard errors adjusted for clustering on country are presented under each marginal effect. \* significant at 5%; \*\* significant at 1%. *parents' foreign citizenship* is coded as follows: 1=both parents are citizens; 2= only mother/father is citizen; 3=neither parents are citizens.

The variable *multiculturalism* (*monoculturalism*) is an indicator variable of answer 1 (2) to the following question: "Some people say that it is better for a country if different racial and ethnic groups maintain their distinct customs and traditions. Others say that it is better if these groups adapt and blend into the larger society. Which of these views comes closer to your own? 1. It is better for society if groups maintain their distinct customs and traditions; 2. It is better if groups adapt and blend into the larger society." For each destination country, *religious difference* measures the dissimilarity between natives and immigrants, in terms of religious affiliation. Regression (2) is based on the following countries: Germany, Great Britain, United States, Netherlands, Norway, Sweden, Canada, Japan.

The variable *against illegal immigrants* is higher (from 1 to 5) the more the respondent agrees with the following statement: "(R's country) should take stronger measures to exclude illegal immigrants." The variable *in favor of political refugees* is higher (from 1 to 5) the more the respondent agrees with the statement that refugees who have suffered political repression in their own country should be allowed to stay in (R's country). The variable *major ethnic group* equals 1 if the respondent belongs to the dominant ethnic group in his country; it equals 0 otherwise. The four variables *national pride* (1)-(4) measure the emphasis with which an individual declares respectively: (1) "feeling close to own country"; (2) "rather be citizen of own country"; (3) "own country better than others"; (4) "in favor of country's interests at any cost". See Mayda and Rodrik (2005) for summary statistics of *national pride* (1)-(4) and details about their construction.

**Appendix 1: Summary Statistics for Demographic Variables and for Individual Attitudes on Immigration (ISSP-NI data set)**

Country	number of obs. in the sample	age	average years of education	male	rural	trade union member	Immig Opinion		Pro Immig Dummy		pro-immig crime		pro-immig culture		pro-immig economy	
							The number of immigrants should be increased		The number of immigrants should be increased		Immigrants do not increase crime rates		Immigr make the country more open to new ideas and cultures		Immigrants generally good for economy	
Germany West	1225	47	10.909	0.536	-	0.378	1.743	20	0.028	18	0.207	10	0.618	5	0.336	6
Germany East	612	48	10.950	0.503	-	0.799	1.662	21	0.020	20	0.132	18	0.500	10	0.292	9
Great Britain	1035	47	11.321	0.403	-	0.216	1.942	16	0.041	14	0.363	6	0.509	9	0.152	16
USA	1310	45	13.426	0.430	1.596	0.162	2.092	12	0.081	9	0.332	7	0.566	6	0.292	10
Austria	991	47	10.355	0.453	-	0.462	2.187	8	0.039	15	0.182	13	0.429	15	0.393	4
Hungary	992	48	10.491	0.427	1.969	0.148	<b>1.591</b>	<b>23</b>	0.015	22	0.098	22	<b>0.179</b>	<b>23</b>	<b>0.078</b>	<b>23</b>
Italy	1092	43	11.028	0.483	1.982	0.338	1.850	17	0.036	16	0.207	9	0.428	16	0.212	13
Ireland	981	46	12.249	0.489	2.015	0.263	<b>2.928</b>	<b>1</b>	0.191	2	<b>0.678</b>	<b>1</b>	0.743	3	0.551	2
Netherlands	2059	44	12.685	0.454	1.724	0.215	2.164	9	0.055	13	0.322	8	0.562	7	0.151	17
Norway	1490	43	12.663	0.499	2.097	0.484	2.138	10	0.074	10	0.100	21	0.466	13	0.111	20
Sweden	1234	45	11.411	0.495	1.241	0.729	2.009	14	0.067	11	0.149	16	0.646	4	0.227	12
Czech Republic	1107	43	12.911	0.508	1.648	0.330	1.842	18	0.024	19	0.150	15	0.207	21	0.079	22
Slovenia	1036	43	10.677	0.440	2.031	0.380	2.061	13	0.019	21	0.206	11	0.271	17	0.189	14
Poland	1597	47	10.287	0.447	1.724	0.148	2.111	11	0.086	6	0.115	20	0.440	14	0.304	7
Bulgaria	1105	49	-	0.476	1.916	0.193	1.781	19	0.059	12	<b>0.062</b>	<b>23</b>	0.248	18	0.127	18
Russia	1580	45	11.187	0.449	1.505	0.619	2.281	5	0.083	8	0.172	14	0.245	19	0.159	15
New Zealand	989	46	14.310	0.473	1.498	0.212	2.226	6	0.116	4	0.387	5	0.749	2	0.468	3
Canada	1487	42	14.761	0.486	1.157	0.333	2.666	2	<b>0.206</b>	<b>1</b>	0.527	2	<b>0.773</b>	<b>1</b>	<b>0.605</b>	<b>1</b>
Philippines	1194	40	9.393	0.502	1.747	0.019	2.203	7	0.115	5	0.482	4	0.486	11	0.297	8
Japan	1256	46	11.868	0.458	-	0.308	2.609	3	0.157	3	0.146	17	0.467	12	0.363	5
Spain	1220	45	10.127	0.476	1.480	0.084	2.596	4	0.084	7	0.500	3	0.552	8	0.245	11
Latvia	768	46	11.611	0.389	1.938	0.197	1.638	22	<b>0.004</b>	<b>23</b>	0.199	12	0.215	20	0.126	19
Slovak Republic	1383	41	11.836	0.484	-	0.322	1.996	15	0.030	17	0.124	19	0.189	22	0.087	21
Mean	total	44.809	11.675	0.468	1.703	0.313	2.128		0.074		0.255		0.462		0.251	
Standard Deviation	n=27,743	16.913	3.572	0.499	0.898	0.464	1.007		0.262		0.436		0.499		0.434	

The sample excludes all individuals who are not citizens of the country where they are interviewed. The second column of last 5 variables gives the ranking of countries according to that variable. Bold numbers correspond to highest and lowest values.

Male is coded as follows: 1 male, 0 female (i.e., missing values are excluded) Rural is coded as follows: 1 urban, 2 suburbs/city-town, 3 rural. Trade Union Member is coded as follows: 1 member, 0 non member (i.e., missing values are excluded).

Immig Opinion gives responses to the following question: "Do you think the number of immigrants to (R's country) nowadays should be ...": reduced a lot (1), reduced a little (2), remain the same as it is (3), increased a little (4), increased a lot (5). In the definition of Immig Opinion, missing values include "can't choose" and NA responses Pro Immig Dummy =1 if Immig Opinion =4 or 5; 0 if Immig Opinion =1,2 or 3; can't choose and NA are missing values.

pro-immig crime =1 if Immig Crime Opinion =4 or 5; 0 otherwise. pro-immig culture =1 if Immig Culture Opinion =4 or 5; 0 otherwise. pro-immig economy =1 if Immig Economy Opinion =4 or 5; 0 otherwise.

Immig Crime Opinion gives responses to the following question: How much do you agree or disagree with each of the following statements? Immigrants increase crime rates. (1=agree strongly; 5=disagree strongly)

Immig Culture Opinion gives responses to the following question: How much do you agree or disagree with each of the following statement? Immigrants make (R's country) more open to new ideas and cultures (disagree strongly=1;agree strongly=5).

Immig Economy Opinion gives responses to the following question: How much do you agree or disagree with the following statement? Immigrants are generally good for (R's country's) economy (disagree strongly=1;agree strongly=5)

**Appendix 3: Per capita GDP of the countries in the ISSP and WVS samples**

**Appendix 2: World Value Survey Summary Statistics of Immigration Policy Preferences**

country	Pro Immig Dummy (WVS)
Philippines	0.249
Puerto Rico	0.283
Macedonia	0.322
S.Africa	0.339
USA	0.346
Taiwan	0.350
India	0.353
Finland	0.392
Germany East	0.403
Sweden	0.406
Turkey	0.407
Venezuela	0.425
Lithuania	0.438
China	0.440
Estonia	0.452
Norway	0.458
Latvia	0.466
Peru	0.475
Dominican Republic	0.492
Japan	0.497
Montenegro	0.514
Australia	0.533
S.Korea	0.539
Russia	0.539
Moldova	0.540
Nigeria	0.541
Switzerland	0.567
Bulgaria	0.572
Argentina	0.587
Serbia	0.599
Mexico	0.602
Slovenia	0.604
Chile	0.612
Croatia	0.614
Brazil	0.615
Georgia	0.666
Uruguay	0.687
Belarus	0.705
Germany West	0.710
Spain	0.716
Armenia	0.723
Ukraine	0.734
Bosnia	0.759
Azerbaijan	0.781
<b>total mean</b>	<b>0.533</b>
<b>standard deviation</b>	<b>0.499</b>

Immig Opinion Dummy (WVS) equals 1 if the individual answered a. or b. to the immigration-related question, 0 if c. or d.; "Don't Knows" are missing values.

The immigration-related question asks: "How about people from other countries coming here to work. Which one of the following do you think the government should do?"

a. Let anyone come who wants to; b. Let people come as long as there are jobs available; c. Place strict limits on the number of foreigners who can come here; d. Prohibit people coming here from other countries.

country	per capita GDP in 1995 (PPP-adjusted)	log of per capita GDP in 1995 (PPP-adjusted)
Nigeria	824.990	6.715
Bangladesh	1280.880	7.155
Ghana	1709.830	7.444
Pakistan	1765.360	7.476
India	1871.220	7.534
Armenia	1938.330	7.570
Azerbaijan	1982.220	7.592
Georgia	2016.160	7.609
Moldova	2403.020	7.784
China	2681.390	7.894
Philippines	3633.240	8.198
Ukraine	3811.710	8.246
Macedonia	4299.560	8.366
Dominican Republic	4350.740	8.378
Peru	4419.710	8.394
Latvia	5037.370	8.525
Belarus	5217.670	8.560
Lithuania	5626.700	8.635
Bulgaria	5679.510	8.645
Croatia	5905.530	8.684
Turkey	5924.610	8.687
Colombia	6012.530	8.702
Venezuela	6019.300	8.703
Romania	6543.390	8.786
Estonia	6558.690	8.789
Brazil	6726.440	8.814
Poland	6794.980	8.824
Russia	7206.220	8.883
Mexico	7221.970	8.885
Chile	7733.390	8.953
Uruguay	8017.480	8.989
S.Africa	8631.180	9.063
Slovakia	8667.670	9.067
Hungary	9577.070	9.167
Argentina	10940.100	9.300
Czech Republic	12414.290	9.427
Slovenia	13191.210	9.487
S.Korea	13758.830	9.529
Portugal	13774.940	9.531
Spain	15412.220	9.643
Ireland	17844.910	9.789
Finland	19204.450	9.863
Britain	19880.390	9.897
Sweden	20449.570	9.926
Italy	20888.240	9.947
France	21065.020	9.955
Netherlands	21087.570	9.956
Australia	21562.500	9.979
Germany	22029.480	10.000
Austria	22672.040	10.029
Belgium	22892.860	10.039
Iceland	23305.430	10.056
Canada	23487.480	10.064
Denmark	23527.680	10.066
Japan	23725.340	10.074
Norway	25336.920	10.140
Switzerland	25964.120	10.164
USA	28173.420	10.246