Financing Public Goods and Attitudes Toward Immigration

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Abstract

We present a model in which individuals choose both the level of provision of a public good and the quota of low-skilled immigrants that are allowed into the country. Individuals can supplement the public good in the private market. Immigrants affect natives through three channels: (i) the labor market; (ii) tax collection; (iii) the quality of the public good. We find that the higher the political weight of the rich (highly skilled) is, the less tolerant the poor and the middle-class are toward immigration and the more demanding they are toward increasing public spending. The rich are the most favorable to immigration. As they have more weight, the political outcome is closer to their preferences and further from the preferences of the other groups. We use data from the European Social Survey to test the implications of our model.

Keywords: Probabilistic voting model, public goods, immigration.

JEL classification numbers: H41, J61, D72.

1   Introduction

Several socioeconomic factors determine native attitudes toward immigrants and hence toward immigration policies. Native workers can be reluctant to receive more immigrants due to concerns about labor market competition from foreigners.[1] Another economic issue is whether immigration causes an increased tax burden on natives. That is, whether immigrants are net beneficiaries of the welfare system (Kerr and Kerr, 2011). It is this impact that has raised recently a great deal of concern regarding immigration in several European countries, particularly due to the economic crisis.[2] On top of these traditional factors that work through the labor market and the welfare state, it is also important to consider how the political process affects public opinion about immigrants. Political competition leads politicians to implement immigration policies that satisfy the interest of a majority, which in turn may foster hostile attitudes toward foreigners among those in a minority. That is, we argue that a great deal of variation in attitudes toward immigration is left unexplained by the aforementioned traditional factors. Two identical individuals (in observable characteristics) may have very different attitudes toward immigration simply because they live in regions with very different numbers of immigrants. Our point is that the type of political majority in a region is a crucial factor in shaping attitudes toward immigration.

The aim of this paper is to assess, theoretically and empirically, to what extent labor-market concerns, welfare state considerations, and political competition drive native attitudes toward immigration. We develop and test a model in which the interplay between immigration process, labor-market concerns, and welfare-state considerations determine the shape of native preferences regarding immigration and social (tax-expenditure) policies. Our model embeds the political economy model of public provision of private goods developed by Epple and Romano (1996) into a setting where agents also decide on immigration quotas. We consider three groups of natives who differ in their skill levels (low-, medium-, and highly skilled) and their political preferences. Natives first decide how much to supplement

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[1]See Blau and Kahn (2012) for a recent survey on the impact of immigration on income distribution.

[2]In fact, it is the perception by natives, not the true effect, what matters. For example, Cunningham (2006) demonstrates that, contrary to popular perceptions, communities in the US with high use of emergency departments have fewer immigrants.

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a public good by private purchases and, second, they choose both an immigration policy and a tax-expenditure policy by majority vote. To obtain a voting equilibrium we use a version of the probabilistic voting model by Lindbeck and Weibull (1987).[3] We use this model as it guarantees the existence of a political equilibrium in multi-dimensional models. It is particularly useful when citizens can be partitioned into different groups, as is our case.

The most interesting implication of our model is as follows. We find that, the more influential the highly skilled group is, the higher the opposition to immigration will be among the low- and middle-skilled natives. In particular, low- and medium-skilled natives living in regions where the highly skilled are the most powerful group are: (i) more willing to restrict immigration and (ii) more willing to raise taxes and spending, compared to low- and medium-skilled natives living in regions where the highly skilled are not the most powerful group. In other words, we find greater polarization of opinions on immigration in those regions in which the highly skilled group dominates. The intuition is simple. Where the rich are decisive, the political outcome is close to their bliss point. That is, a high immigration quota and a low level of public good provision. Yet this political outcome is far away from the bliss point of the other two groups, compared to regions in which the highly skilled are not decisive.

To test these implications we use data from the 2008 wave of the European Social Survey (ESS).[4] In the ESS we find several questions in which individuals express their attitudes toward immigrants, together with many other individual and socioeconomic data. There is also information on attitudes toward public expenditure. Individuals answer whether or not they are willing to raise spending and taxes.[5] Since we have also information on the region of residence at the NUTS-1 level, we can compute the fractions that the three groups represent.[6] Individuals with higher education will be the highly skilled (the rich), individuals

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[3]See also Persson and Tabellini (2000).

[4]ESS Round 4: European Social Survey Round 4 Data (2008). Data file edition 4.1. Norwegian Social Science Data Services, Norway – Data Archive and distributor of ESS data.

[5]The reason for using only the 2008 wave is that in the other waves individuals are not asked about their attitudes regarding public expenditure.

[6]The Nomenclature of Territorial Units for Statistics (NUTS) is a hierarchical system for dividing up the economic territory of the European Union for the purpose of collection and harmonization of EU regional statistics. NUTS 1 refers to the major socioeconomic regions. As an example, according to NUTS 1 Belgium is divided into three regions: Brussels Capital Region (BE1), Flemish Region (BE2), and Walloon Region (BE3).

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with at most secondary education will be the middle-skilled, and individuals with at most primary education will be the low-skilled. We can then identify the regions in which the highly skilled have a higher weight than the other groups.

We want to explain individual preferences regarding both immigration and public spending. In fact, our main point is that these preferences are jointly determined. The natural alternative is, therefore, to use a model in which this is explicitly taken into account. Since both variables of interest are dummy variables, we propose to use a bivariate Probit model. In accordance with previous literature we find evidence in favor of the labor market and the welfare state hypothesis. But we also find strong evidence in favor of the "political process" channel. In particular, in our preferred specification that the probability of the low-skilled being pro-immigration is a 20% lower if they live in a region where the highly skilled are a majority, compared to a region where the highly skilled are not a majority. For the middle-skilled that probability is a 19% lower. Interestingly, we also find that the probability of the highly skilled being pro-immigration is a 20% higher in those regions in which they are a minority group. This must be because the political outcome in those regions is tilted toward the bliss point of the other groups.

There are some papers in the literature analyzing the political economy of immigration. Ortega (2010) develops a theoretical model to analyze the political sustainability of the welfare state. In his model agents choose redistribution and immigration policy by majority vote. He shows that unskilled voters use unskilled immigration policy as a device that allows them to guarantee a higher degree of redistribution in the future. Llavador and Solano-García (2011) present a political economic model in which labor-market concerns together with non-economic factors, e.g., cultural and security concerns, shape native attitudes toward immigrants.[7] Our paper expands this literature by looking at the integrated predictions of both the size of the welfare state and the size of the immigration quota. Even though in our theoretical model we do not consider non-economic factors, this dimension can easily be

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[7]Benhabib (1996) and Roemer and Van der Straeten (2004) also apply a political economic approach to study how immigration policies are determined. Benhabib develops a model in which the supply of immigrants is fixed and immigrants are heterogeneous in capital endowment. Roemer and Van der Straeten consider a model where voters' preferences regarding immigration and economic policies are exogenous.

incorporated. In that case voters would be characterized by two non-economic components: their "intrinsic" attitude toward immigrants and their political preferences. Since these dimensions are orthogonal to economic policy platforms, political candidates in equilibrium would still try to satisfy groups with a higher number of swing voters.[8]

Our paper also relates to the extensive empirical literature on immigration. The works of Dustman and Preston (2007) and Facchini and Mayda (2009) are of particular interest.[9] Dustman and Preston (2007) estimate an structural model which considers three different channels that may shape individuals attitudes toward immigration, labor market and welfare state concerns, and cultural and racial prejudices. Regarding the second channel, they implicitly assume that the welfare state adjusts to immigration through changes in the tax rate keeping per capita benefits constant. They find that for British highly-educated people, welfare concern is the most important channel through which their preferences regarding further immigration seem to be shaped. Facchini and Mayda (2009) develop and test a theoretical model in which labor market and welfare state considerations interact with each other to form public opinion about immigration. They consider a fixed exogenously given welfare system which automatically adjusts to the arrival of immigrants either by increasing the tax rate to keep per capita expenditure constant or by reducing per capita benefits, keeping the tax-rate constant. They show that attitudes toward immigration are heterogeneous across native population and that they depend on how the welfare system adjusts to the rise of the population size.

Our theoretical model shows that the arrival of immigrants first causes distributional effects (the labor market hypotheses) and then changes native preferences regarding tax-expenditure policies, suggesting that determinants of public opinion about immigration and the welfare system should be jointly estimated. One downside of the previous empirical literature is that the joint determination of preferences regarding taxes and immigration policies is typically ignored. Hence existing estimations may not capture the full extent of the effect of the welfare state channel on individual attitudes toward immigrants and the reported estimations can be biased. The current paper contributes to the empirical

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[8]In our empirical part, though, we control for non-economic factor as drivers of opinions.
[9]See also Scheve and Slaughter (2001) and Mayda (2006).

literature in two respects. First, our econometric approach takes explicitly into account that preferences regarding tax-expenditure policy and immigration policy are jointly determined. Thus we provide more precise estimations of the effects that the labor market and the welfare state channels have on native attitudes toward immigration. Second, we provide empirical evidence for the European countries covered in the ESS.

The rest of the paper is organized as follow: Section 2 describes the economic environment and the political process. In Section 3 we characterize individual private decisions and Section 4 looks for political equilibrium outcomes. In Section 5, we present our empirical approach and the main results of the paper. Section 6 includes some robustness checks and Section 7 concludes.

2   The model

2.1   Population and technology

Total working age population is composed of three types of individuals: highly skilled individuals, i.e., those with a college degree, medium-skilled workers, i.e., those who completed secondary education but did not attend college, and low-skilled workers, who are those who dropped out from high school. Let N_J represent the number of type J workers, with $J = H, M, L$. The total number of natives is fixed and it is equal to $N = N_H + N_M + N_L$. Later on, natives will decide how many (low-skilled) immigrants are allowed in. In particular, we will call I the number of immigrants that are allowed to enter the country, with $I \in [0, \overline{I}]$. Total population will be, therefore, $P = N + I$.

There are three production factors, corresponding to the three types of labor, and all people work the same fixed number of hours during their lifetime. Labor supply is denoted by L_H, L_M, and L_L for high, medium-, and low-skilled workers, respectively. Following Johnson (1984) we assume a linear homogeneous production function of the three types of labor:

$$y = F\left(L_H, L_M, L_L\right), \tag{1}$$

where $\frac{\partial F}{\partial L_J} > 0$ and $\frac{\partial^2 F}{\partial L_J^2} < 0$ for $J = H, M, L$. Markets are assumed to be competitive and, therefore, the equilibrium wage of factor J is $w_J = \frac{\partial F}{\partial L_J}$. By homogeneity of F, total labor income $\sum_{J=H,M,L} w_J L_J$ equals total output y. Note that labor supplies of the three factors are $L_H = N_H$, $L_M = N_M$, and $L_L = N_L + I$, respectively.

We assume that highly skilled workers are complementary to both medium- and low-skilled workers, while medium- and low-skilled workers are perfect substitutes of each other. This means that medium- and low-skilled workers, that is, those who did not attend college, perform the same tasks. We also assume that the former are more productive than the latter because of their higher level of education. We rewrite the production function in the following way:

$$y = f(L_H, G),$$ (2)

where $G = bL_M + L_L$, and $b \geq 1$. The following equations show how a rise in the number of low-skilled workers affects wages in this economy:

$$\frac{\partial w_H}{\partial L_L} = \frac{\partial^2 f}{\partial L_H \partial G} > 0,$$ (3)

$$\frac{\partial w_M}{\partial L_L} = b\frac{\partial^2 f}{\partial G^2} < 0,$$ (4)

$$\frac{\partial w_L}{\partial L_L} = \frac{\partial^2 f}{\partial G^2} < 0.$$ (5)

Our technology implies that a rise in the number of low-skilled workers due, for example, to the inflow of immigrants, leads to a rise in the wage of highly skilled workers and to a fall in the wages of both medium- and low-skilled workers. Note finally that the arrival of immigrants is always positive for the country as a whole, since total output y increases monotonically with L_L.

2.2 Policy instruments and individual preferences

The government levies a proportional income tax τ which yields total tax revenue $R = \tau y$. Taxes are used to finance public services, which are produced using a numeraire commodity with a constant returns to scale technology. One unit of the publicly provided service is

produced by using p units of the numeraire. To save notation, we normalize $p = 1$. Here we will refer to public services as health services, although the analysis applies also to other goods or services that can be supplemented with private purchases such as education, law enforcement, public transportation, etc.

Individuals have preferences regarding two commodities: (a) health services h and (b) a composite good, c, to which we will refer as consumption. Let $U(c, h)$ be the utility function, which is assumed to be quasi-concave and twice continuously differentiable over (c, h). In addition, we make the standard assumptions that both c and h are normal goods and that the utility function is such that $\lim_{c \to 0} U(c, h) = -\infty$ and $\lim_{h \to 0} U(c, h) = -\infty$. This guarantees that individuals prefer any pair $(c, h) >> 0$ to both $(c, 0)$ or $(0, h)$.

Government provides health services with quality q, the same for all individuals. In particular, we propose:

$$q = \frac{R}{P^\epsilon}, \tag{6}$$

where $P = N + I$ is the number of public health users in the population, and $\epsilon \geq 0$ is a parameter that captures congestion effects.[10] Quality q rises with tax revenue (R) and falls with population (P). This parametrization was used first by Borcherding and Deacon (1972) and Bergstrom and Goodman (1973).[11] The case $\epsilon = 0$ corresponds to a pure public good where quality is completely independent of population and coincides with expenditure R. When $\epsilon = 1$, quality is exactly per capita expenditure. The higher the parameter ϵ is, the more congested is the public good. We will focus on the case in which $\epsilon > 0$. This means that we are excluding the case of a pure public good.

Individuals can supplement public health services by purchasing additional health services in the private market. We call s the amount of health services purchased privately. The cost of one unit of private health service is one unit of the numeraire. That is, we assume that there are no differences in productivity between the public and the private sector, and also that markets are competitive in the sense that private health suppliers are price-takers. The total amount of health services consumed by an individual of type J is, therefore, $h_J = q + s_J$.

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[10] The elasticity of q with respect to P is $-\epsilon$.

[11] See also Reiter and Weichenrieder (1999).

The first part (q) is common to all individuals and the second part (s_J) is group-specific.

2.3   Individual voting behavior

Natives vote on candidates (parties), A and B, whose electoral platforms specify values for the policy instruments. Let e_k represent the policy platform of candidate k, with $k = A, B$. In particular, $e_k = (\tau_k, q_k, I_k)$. The first and second components are the economic policy instruments and the third component describes the immigration policy. However, since q_k is completely determined by τ_k and I_k we can simply write $e_k = (\tau_k, I_k)$. Candidates can make binding promises on both policy instruments. Following Lindbeck and Weibull (1987), we assume there is another dimension that is relevant for voters in which candidates cannot make binding promises. Some authors call this additional dimension ideology, but this is just one possible interpretation. This ideological dimension is orthogonal to the policy platform e_k and cannot be modified during the electoral campaign. In addition, we assume that voters within skill groups differ in their evaluation of this ideology dimension. Then, the policy platform together with candidate ideology determines voter decisions.

Consider an individual j with skill level J. Let $W_J(e)$ denote j's indirect utility function, which we will explain in detail in Section 4. As a voter, j prefers candidate A if:

$$W_J(e_A) > W_J(e_B) + \sigma_{j,J} + \delta, \tag{7}$$

where $\sigma_{j,J}$ is an individual parameter that measures voter j individual ideological bias toward candidate B. When $\sigma_{j,J} = 0$ individual j only cares about economic policy. When $\sigma_{j,J} > 0$ the voter has a bias in favor of candidate B. We assume that $\sigma_{j,J}$ follows a uniform distribution on $[-\frac{1}{2\phi^J}, \frac{1}{2\phi^J}]$, with density ϕ^J. On the other hand, the parameter δ measures the average popularity of candidate B in the whole population. This parameter also follows a uniform distribution on $[-\frac{1}{2\varphi}, \frac{1}{2\varphi}]$, with density φ.

Parameter ϕ^J measures how sensitive individuals in group J are to economic policy. A higher value of ϕ^J means that voters of type J are more concerned about economic and immigration announcements than about "ideological" issues.

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2.4   Timing of the model

The timing of events is as follows: (1) foresighted individuals decide the amount of private health care supplement s and the amount of private consumption, taken as given a policy vector $e = (\tau, I)$. (2) The two candidates announce their policy platforms simultaneously: e_A and e_B. At this stage, both candidates are acquainted with voter policy preferences, the distributions of $\sigma_{j,J}$, and δ, but not yet their realized values. (3) The value of the parameter δ is revealed. (4) The election takes place, and the elected candidate implements her announced policy platform.

3   Individual private choices

In Stage 1, individuals choose to what extent they want to supplement public health services, taking into account their expectations regarding the equilibrium policy vector $e^E = (\tau^E, I^E)$. The superindex E denotes expectations. The utility of a type-J individual is $U((1 - \tau^E)w_J(I^E) - s_J, q^E + s_J)$. The first-order condition for private health services is:

$$-U_c(c_J, h_J) + U_h(c_J, h_J) \leq 0 \ (= 0 \text{ if } s_J > 0). \tag{8}$$

Let $h_J((1 - \tau^E)w_J(I^E))$ denote the demand function for health care services of an individual of type J, given her expectation over public health services q^E.[12] Recall that, for fixed values of τ^E and I^E, the value of q^E is fixed as well. Then, if $h_J((1 - \tau^E)w_J(I^E)) \leq q^E$ we get $s_J = 0$, while if $h_J((1 - \tau^E)w_J(I^E)) > q^E$ we obtain $s_J > 0$. Moreover, in the latter case we have $h_J((1 - \tau^E)w_J(I^E)) = q^E + s_J$. When $s_J > 0$, the level of public provision q^E acts as an income grant.[13] Finally, since health is a normal good, we get $s_L \leq s_M \leq s_H$. A very likely situation is the case in which $0 = s_L \leq s_M < s_H$. That is, the low-skilled choose not to supplement the public health service, the highly skilled choose to supplement, while the middle-skilled are in between.

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[12] This is similar to Epple and Romano (1996).

[13] Without public provision, the individual gets consumption $w_J(I) - h_J$. With public provision q, consumption becomes $(1 - \tau)w_J(I) + q - h_J$.

4   Political equilibrium and comparative static analysis

We start here by deriving individual preferences regarding policy platforms. We then compute the political equilibrium outcome. Finally, we provide some comparative static results with respect to individual attitudes toward economic and immigration policies.

4.1   Individual preferences regarding policy instruments

To formally study candidate policy announcements at Stage (2), we first compute individual preferences regarding policy platforms. Consider a type-J individual. Let $e_J = (\tau_J, I_J)$ denote her bliss point, which is the solution of $W_J(e) = \max_{\{\tau, I\}} \{U((1-\tau)w_J(I) - s_J, q + s_J))\}$, subject to the restrictions that $0 \leq \tau \leq 1$ and $0 \leq I \leq \overline{I}$. In addition, let $\zeta_J(\tau)$ and $\eta_J(I)$ denote individual J's marginal utilities. Then, the first-order conditions are:

$$\zeta_J(\tau) = -U_c(c_J, h_J)w_J(I) + U_h(c_J, h_J)\frac{\partial q}{\partial \tau} \leq 0, \ (= 0 \text{ if } \tau \in (0, 1)), \tag{9}$$

$$\eta_J(I) = U_c(c_J, h_J)(1-\tau)\frac{\partial w_J}{\partial I} + U_h(c_J, h_J)\frac{\partial q}{\partial I} \lesseqgtr 0, \ (= 0 \text{ if } I \in (0, \overline{I})). \tag{10}$$

Consider Equation (9) and assume that I is fixed. A rise in the tax rate reduces individual J's disposable income, which entails a utility loss. The first term in Equation (9) captures this marginal cost. On the other hand, raising τ allows for a higher provision of the public service, which in turns increases utility. The second term in Equation (9) captures this marginal benefit. The optimal tax rate is such that it balances these opposite effects.

Let us study the possible values for τ. Corner solutions with $\tau = 1$ are not feasible because of our assumption that individuals prefer any $(c, h) >> 0$ to either $(0, h)$ or $(c, 0)$. Depending on the value of s_J we have two possible cases: (i) $s_J = 0$ or (ii) $s_J > 0$. Consider the first case where $s_J = 0$. Here the type-J individual does not purchase health services in the private market. Since any bundle $(c, h) >> 0$ is preferred to $(c, 0)$, her optimal tax rate is $\tau_J \in (0, 1)$.

We now turn to the second case, $s_J > 0$. From the first-order Condition (8) when choosing

s, we have that $U_c(\cdot) = U_h(\cdot)$. The sign of Equation (9) is the sign of the term:

$$\frac{\partial q}{\partial \tau} - w_J = \frac{y}{P^\epsilon} - w_J. \tag{11}$$

At the optimal solution for τ this sign cannot be positive. If it is negative, the type-J individual wants zero provision of public health services, that is, her optimal tax rate is $\tau_J = 0$. This is because she finds it cheaper to get an additional unit of health services through the private market than through public provision. For this individual the marginal cost of an additional unit of publicly provided health is $w_J P^\epsilon / y$.[14] Since the marginal cost through the private market is 1, if $w_J P^\epsilon / y > 1$ or $w_J > y/P^\epsilon$ the private alternative is cheaper for her.[15] If Expression (11) is zero, then the cost of a marginal unit of health service is exactly the same in both sectors. Hence, any value of τ that yields a value of q such that $s_J((1-\tau)w_J) + q = h((1-\tau)w_J)$, with $s_J((1-\tau)w_J) > 0$, maximizes J's utility.

We know from the previous section that $0 \le s_L \le s_M \le s_H$. To avoid considering extreme and unrealistic situations such as the case in which there is no private health care market at all ($s_L = s_M = s_H = 0$) or the case in which nobody demands public health services ($s_L > 0$), we make the following assumption:

Assumption 1 *For each feasible policy $e = (\tau, I)$, $s_L = 0$ and $s_H > 0$.*

An immediate implication of this assumption is that the rich do not want any public provision of health services. Later on we will discuss the effects of relaxing this assumption. Regarding medium-skilled individuals, they supplement if $w_M > \frac{y}{P^\epsilon}$. Let Z be an indicator function that equals one if $s_M > 0$ (i.e. $w_M > \frac{y}{P^\epsilon}$) and zero if $s_M = 0$ (i.e. $w_M \le \frac{y}{P^\epsilon}$). The following lemma summarizes individual preferences regarding the tax-expenditure policy.

Lemma 1 (*Preferences regarding health policy*) *For any given immigration quota I, the optimal tax rates are such that: $0 = \tau_H = Z\tau_M < \tau_L \le (1-Z)\tau_M < 1$.*

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[14]This marginal cost represents the reduction in consumption because of an increase in the public provision of health services:
$$\frac{\partial(w_J(1-\tau))}{\partial q} = -w_J \frac{\partial \tau}{\partial q} = -w_J \frac{P^\epsilon}{y}.$$

[15]If we represent the individual budget set in the space (c, h) we can see that, when Expression (11) is negative, a reduction in τ has always the effect of expanding the budget set.

We next use Expression (10) to discuss the different effects of the number of immigrants I on utility. A marginal increase in the number of low-skilled immigrants affects type-J's welfare through two different channels: (i) the labor market, and (ii) the quality of the public service. The labor market channel is captured by the term $(1 - \tau)\frac{\partial w_J}{\partial I}$. Due to complementarities in the production process, this term is positive for highly skilled individuals, and negative for both medium- and low-skilled individuals. Moreover, the negative impact is stronger for middle-skilled workers than for low-skilled workers (see Section 2.1).

With respect to the quality of the public service, the arrival of low-skilled immigrants affects the quality of public health services by an amount $\frac{\partial q}{\partial I}$, which is common for all three groups and it is equal to:

$$\frac{\partial q}{\partial I} = \tau \left(\frac{\partial y(I)}{\partial I} (N + I)^{-\epsilon} - \epsilon(N + I)^{-\epsilon-1} y(I) \right). \tag{12}$$

The first term reflects the fact that the arrival of immigrants increases the number of taxpayers and, therefore, tax revenue rises. This is captured by the term $\tau \frac{\partial y}{\partial I}(N+I)^{-\epsilon}$. However, the arrival of immigrants increases the size of the population, and hence the number of users of the public service. Therefore, for a given amount of public expenditure, the inflow of immigrants reduces q by an amount $\epsilon \frac{\tau y}{(N+I)^{1+\epsilon}}$. This is the congestion effect. The final effect on q will depend on which one of these two effects prevails. The resulting net effect is what we call *net-tax-base* effect. [16]

The following Lemma ranks individual preferences regarding immigration policies according to their types.

Lemma 2 (*Preferences regarding immigration policy*) *For any given τ, low-skilled and*

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[16] Note that, when $\epsilon \geq 1$ we have $\frac{\partial q}{\partial I} \leq 0$. That is, when congestion effects are strong enough, an increase in the number of immigrants will always be detrimental to the quality of public health services q. To prove this we use the fact that, by homogeneity of the production function $\frac{\partial y(I)}{\partial I} = w_L$. Substituting:

$$\frac{\partial q}{\partial I} = w_L(N + I)^{-\epsilon} - \epsilon(N + I)^{-\epsilon-1} y(I). \tag{13}$$

This will be non-positive provided that:

$$w_L \leq \epsilon \frac{y(I)}{N + I}. \tag{14}$$

Because $y(I)/(N + I)$ is per capita income, we know $w_L \leq y(I)/(N + I)$. If $\epsilon \geq 1$ then $\frac{\partial q}{\partial I} \leq 0$.

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middle-skilled natives will always support tighter immigration policies compared to highly skilled natives. That is, $0 \leq I_L, I_M < I_H = \overline{I}$.

Proof. Under Assumption (1), $s_L = 0 \leq s_M < s_H$. Low-skilled immigration may affect individual preferences through two different channels: (a) the welfare-state and (b) the labor market. Type-H individuals see their wages increase with the arrival of immigrants. By assumption, type-H individuals do not demand public health services, hence $I_H = \overline{I}$.

Low- and medium-skilled individuals prefer a smaller quota of immigrants since the labor market effect for them is negative. As a result, $0 \leq I_L, I_M < I_H = \overline{I}$. In the particular case in which the net-tax-base effect is negative, we have that $0 = I_L = I_M < I_H$. ∎

When we compare the medium- with the low-skilled, things are more complicated. Although the labor market effect is negative for both groups, the size of this negative effect is stronger for the middle-skilled. Moreover, note that the inequality $w_J(I) > \frac{y}{P^{\epsilon}}$ (i.e. $s_J > 0$) is more likely to hold for medium-skilled individuals. Thus, if the middle-class wants zero provision of public health services and the net-tax-base effect is positive, then low-skilled workers may be more favorable to the arrival of low-skilled immigrants compared to medium-skilled workers who would like to have $I_M = 0$. In this case, labor market concerns drive medium-skilled native attitudes toward immigrants, while those of low-skilled natives are determined by both labor market concerns and welfare state considerations.

4.2 Political equilibrium outcome

We now characterize economic and immigration policies that arise as equilibrium in the political process. Individuals vote for those policy platforms that are as close as possible to their bliss point.

To study candidate decisions we have to identify the swing voter in each group J. This is the individual who is exactly indifferent between the platforms of candidates A and B, i.e.:

$$\sigma_J = W_J(e_A) - W_J(e_B) - \delta. \tag{15}$$

Expression (15) implies that those individuals in group J with $\sigma_{j,J} \leq \sigma_J$ will vote for

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candidate A. Consequently, candidate A's vote share in group J is equal to:

$$VS_A^J = \frac{1}{2} + \phi^J \sigma_J. \tag{16}$$

Candidate A's vote share across the three groups, i.e., her total vote share VS_A is:

$$VS_A = \sum_J \frac{N_J}{N} \left(\frac{1}{2} + \phi^J \sigma_J \right). \tag{17}$$

Up to this point δ is still unknown and, therefore, the vote share VS_A is a random variable. Hence, the electoral outcome is also a random variable related to the realization of δ. Thus, candidate A's probability of winning is equal to:

$$
\begin{aligned}
\pi_A(e_A, e_B) &= Prob[VS_A \geq \frac{1}{2}] \\
&= \frac{1}{2} + \frac{\varphi}{\phi}[\sum_J \frac{N_J \phi^J}{N}(W_J(e_A) - W_J(e_B))], \tag{18}
\end{aligned}
$$

where $\phi = \sum_J \frac{N_J \phi^J}{N}$ is the average density across groups. Candidate B's probability of winning is, therefore, equal to $1 - \pi_A$. Note that π_A is continuous in e_A.

Candidates A and B commit to policies e_A and e_B so as to maximize π_A and $(1 - \pi_A)$, respectively, with π_A given by Expression (18). Because both candidates face the same optimization problem, the unique Nash equilibrium has both candidates converging to the same policy platform: $e_A = e_B = e^*$, which must also satisfy individual expectations e^E. Hereafter, e^* denotes the policy platform that arises as a political equilibrium outcome.

Consider candidate A. She chooses a policy platform e_A so as to maximize:

$$L = \pi_A(e_A, e_B) + \rho_1(1 - \tau) + \rho_2(\bar{I} - I) + \rho_3 \tau + \rho_4 I, \tag{19}$$

taken platform e_B as given. Here ρ_i, with $i = 1, 2, 3, 4$, are the Lagrange multipliers. From Expression (18) we see that Candidate A is, in fact, maximizing a weighted social welfare

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function. The Kuhn-Tucker conditions are:

$$\frac{\partial L}{\partial \tau} = \frac{\varphi}{\phi} \sum_J \frac{N_J \phi^J}{N} \zeta_J(\tau) - \rho_1 + \rho_3 = 0. \tag{20}$$

$$\frac{\partial L}{\partial I} = \frac{\varphi}{\phi} \sum_J \frac{N_J \phi^J}{N} \eta_J(I) - \rho_2 + \rho_4 = 0, \tag{21}$$

This optimization problem has one interior solution and eight corner solutions. As the key implication of our theoretical model (Section 4.3) does not depend on the nature of the solution, we restrict our attention to the interior solution, and re-write the first-order conditions as:

$$\frac{\partial L}{\partial \tau} = \frac{\varphi}{\phi} \sum_J \frac{N_J \phi^J}{N} \zeta_J(\tau) = 0. \tag{22}$$

$$\frac{\partial L}{\partial I} = \frac{\varphi}{\phi} \sum_J \frac{N_J \phi^J}{N} \eta_J(I) = 0. \tag{23}$$

The policy platform (τ^*, I^*) is the solution to the equation system (22)-(23). This solution maximizes the utility function of the average swing voter, i.e., the voter whose income is equal to $\tilde{w} = \sum_J \frac{N_J \phi^J w_J}{N}$. Note that the policy platform (τ^*, I^*) balances the opposite effects (weighted by group relative size and group sensitiveness to policy issues) that work through the labor market and the welfare system.

Assumption 2 *Densities* ϕ^H, ϕ^M, *and* ϕ^L *are such that:* $\phi^M > \phi^H > \phi^L$.

Assumption 3 *Densities* ϕ^H, ϕ^M, *and* ϕ^L *are such that:* $\phi^H > \phi^M, \phi^L$.

According to Assumption 2 the medium-skilled have the highest number of swing-voters, followed by the high and the low-skilled, respectively. Medium-skilled voters, therefore, are more sensitive to the policy dimension in the political process and, hence, are the most profitable for candidates in terms of votes. This implies that if a candidate moves toward medium-skill voters' most preferred policy, she obtains a gain in terms of votes that offsets the loss of votes in the other two groups. As a result, the equilibrium policy platform is closer to the bliss-point of the native medium-skill individuals. This assumption also implies

that the equilibrium policy platform will be further away from the bliss point of the low-skilled than from the one of the highly skilled. On the contrary, if Assumption 3 holds, there are more swing-voters among the highly skilled and, therefore, candidates tilt their policy platforms toward the highly skilled voters' most preferred policy platform. We are now ready to characterize the configuration of the political equilibrium outcome.

Corollary 3 (*Political Equilibrium*) *Assume that $s_M = 0$.*

   (i) *If Assumption 2 holds, medium-skilled individuals are decisive. Opportunistic candidates tilt their policy platform toward the bliss point of the medium-skilled voters. Then, at the political equilibrium outcome (τ^*, I^*) we have that: $0 = \tau_H \leq \tau^* \leq \tau_M < 1$ and $0 \leq I_M \leq I^* < I_H = \overline{I}$.*

   (ii) *If Assumption 3 holds, opportunistic candidates propose a policy platform closer to the bliss point of the highly skilled voters. Then, at the equilibrium $0 = \tau_H \leq \tau^* \leq \tau_M < 1$ and $0 \leq I_M < I^* \leq I_H = \overline{I}$.*

Note that if $s_M > 0$, and hence $\tau_M = 0$, then $\tau^* \in [0, \tau_L)$ regardless of which group is decisive. The equilibrium immigration quota I^* does not change.

4.3   Comparative static analysis of individual preferences

The parameter ϕ^J measures how sensitive to policy announcements voters of type J are. Since we are interested in analyzing the effect of a larger influence of the highly skilled group on policy announcements, and its consequences on low and medium-skilled groups' attitudes toward immigration and economic policies, we have to study what happens if we raise the parameter ϕ^H (keeping ϕ^M and ϕ^L fixed).

Assumption 4 *Candidate A's probability of winning is such that $\frac{\partial^2 \pi_A}{\partial \tau \partial I} \leq 0$.*

The cross derivative $\frac{\partial^2 \pi_A}{\partial \tau \partial I}$ describes to what extent tax-expenditure and immigration policies are jointly determined. The higher its absolute value is, the stronger the link is between τ and I. In particular, if $\frac{\partial^2 \pi_A}{\partial \tau \partial I} = 0$ the equilibrium level τ^* does not depend on the

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immigration quota I. This is implicitly assumed by most of the existing empirical literature.[17] The fact that $\frac{\partial^2 \pi_A}{\partial \tau \partial I} \leq 0$ means that the marginal effect of τ on π_A decreases with I. The intuition is the following. Consider the case in which $\frac{\partial \pi_A}{\partial \tau}$ is positive. An increase in τ, all other things being constant, increases the quality of the public health service. Candidate A gets some additional votes from those who are willing to support a marginal tax increase, hence π_A increases. In addition, if at the same time, candidate A raises the immigration quota, the congestion effect gets worse decreasing q, which reduces the marginal increment in the number of votes.

Proposition 4 *Suppose that Assumption 4 holds. Then, an increase in ϕ^H, ceteris paribus, decreases τ and increases I at the equilibrium.*

Proof. Consider first the interior solution case. Equations (22) and (23) determine τ and I as functions of the parameters ϕ^H, ϕ^M, and ϕ^L. Let HM be the Hessian matrix and $|HM|$ its determinant. By differentiating the system, we obtain the effects that changes in ϕ^H have on policy instruments.

$$\frac{\partial \tau}{\partial \phi^H} = \frac{1}{|HM|} \frac{N_H}{N} \left[-\zeta_H(\tau) \frac{\partial^2 \pi_A}{\partial I^2} + \eta_H(I) \frac{\partial^2 \pi_A}{\partial I \partial \tau} \right].$$

$$\frac{\partial I}{\partial \phi^H} = \frac{1}{|HM|} \frac{N_H}{N} \left[-\eta_H(I) \frac{\partial^2 \pi_A}{\partial \tau^2} + \zeta_H(\tau) \frac{\partial^2 \pi_A}{\partial I \partial \tau} \right].$$

Note that $|HM|$ is positive from the second order conditions. If Assumption 2 holds, the middle group is decisive and, hence, $0 = \tau^H \leq \tau^* \leq \tau^M$ and $I^M \leq I^* < I^H$. As a result, $\zeta_H(\tau) \leq 0$ and $\eta_H(I) \geq 0$, implying that $\frac{\partial \tau}{\partial \phi^H} \leq 0$ and $\frac{\partial I}{\partial \phi^H} \geq 0$.
If Assumption 3 holds, the political equilibrium outcome is closer to the bliss point of the highly skilled group. However, the inequalities $0 = \tau^H \leq \tau^* \leq \tau^M$ and $I^M < I^* \leq I^H$ still hold and, hence, results do not change.
If the parameters of the model are such that we have a corner solution in which either τ^* or I^* is not at a corner, then an increase in ϕ^H may only affect the optimal value of the variable whose restriction is not binding. It is also possible, however, that changes in ϕ^H move the

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[17]Preferences represented by a Coob-Douglas utility function correspond to this case.

optimal solution away from the corner. For instance, consider the case where $\tau^* \in (0,1)$ and $I^* = 0$. An increase in ϕ^H makes the highly skilled more profitable in terms of votes and, hence, candidates tilt their policy announcement toward the bliss point of the highly skilled group. This means that τ^* decreases and I^* becomes strictly positive. Now, consider the case where the parameters of the model are such that the equilibrium policy is $(0, I^*)$. Under this scenario, a rise in ϕ^H may only affect the optimal value of I^* since there is no room to change the value of τ. An analogous argument applies to other corner solutions. $\blacksquare$

This proposition shows that policy instruments τ and I are, respectively, non-increasing and non-decreasing functions of the parameter ϕ^H. This is because as ϕ^H rises, the skilled population becomes more profitable in terms of votes, and politicians tilt their announcements toward highly skilled individuals' bliss point, making the medium-skilled individuals less tolerant to the arrival of immigrants and more willing to expand public expenditure.[18]

Corollary 5 *As $\frac{\phi^H}{\phi}$ increases, medium skilled individuals are: (i) less tolerant to the arrival of immigrants, and (ii) more willing to rise tax-expenditure policies.*

Corollary (5) also explains what happens with the rich group's attitude when the political influence declines for this group. If ϕ^H falls, political competence leads to a rise in the tax rate and to a tighter immigration policy, making the rich more willing to reduce public expenditure and more favorable to increasing the immigration quota. Our econometric analysis will concentrate on the impact of the political process and individual attitudes toward immigration, although we will also study the impact on tax-expenditure policies.

Before concluding this section we will analyze the consequences on our comparative statics results of relaxing Assumption 1. First, consider the case in which $s_L > 0$. All three groups supplement in the private market. As a consequence of this, everybody prefers no public provision of health services at all and, hence, $\tau_J = 0$ for the three groups. We have $e^* = (0, I^*)$. Again, an increase in ϕ^H moves I^* toward I_H, making medium-skilled individuals

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[18]Note that the effect of a rise of ϕ^H on low-skilled natives' preferences is ambiguous. This has to do with the fact that the optimal policies are $0 = \tau_H < \tau_L \le \tau_M$ and $0 \le I_L, I_M < I_H$. However, if $s_M > 0$, and hence $\tau^* \in [0, \tau^L)$, a rise in ϕ^H makes low-skilled individuals more willing to support a marginal tax-rise. Regarding the immigration policy, if the net-tax-base effect is negative, then the interests of both low and medium-skilled natives are aligned and both oppose the rise of I.

less tolerant to the arrival of immigrants. On the other hand, as everyone agrees on the optimal tax rate, $\tau^* = 0$ does not change.

Second, consider the case in which the three groups demand only public health services and the private health care market does not exist ($s_J = 0$ for every J). Under this equilibrium, the effect of ϕ^H on both policy instruments is ambiguous. The intuition of this is the following. Consider the tax-expenditure policy, τ. As we assume that h is normal, we have $0 < \tau_L \leq \tau_M \leq \tau_H < 1$. If ϕ^H increases, there are two opposite effects at work. Candidates tilt τ^* toward τ_H, improving the quality of the public health service, and hence increasing the number of votes among type-H population. This is an income effect. But, at the same time, candidates move the immigration policy toward I_H; a higher number of unskilled-immigrants are allowed to come into the country. This makes the congestion effect worse, which may decrease q, thus offsetting the income effect. Depending on which effect dominates, τ^* can increase or decrease. A similar argument applies for I^*. However, if we restrict Assumption 4 to $\frac{\partial^2 \pi}{\partial \tau \partial I} = 0$, then it is possible to show that both policy instruments, τ and I, monotonically increase with ϕ^H.

5   Empirical Analysis

We derive some testable implications from our theoretical model. First, in Section 4.1 we obtained the preferred policies for the three skill groups. In particular, Lemma 1 provides a partial characterization of policy preferences regarding immigration. Second, we propose different equilibrium configurations in corollaries 2 and 3. However, we cannot test these results without precise data on the implemented policies. Fortunately, we can do so indirectly by using the results of Corollary 5. This is what we will explore next.

5.1   Data and descriptive results

We use data from the 4th wave (2008) of the European Social Survey (ESS). The ESS is a social survey that gathers information on attitudes and beliefs of individuals from several

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European countries.[19] In the 2008 wave, 29 countries were covered with a total of 56,752 observations.[20] Since we are interested in studying individual opinions about immigration we exclude 7,805 observations from the four countries (Bulgaria, Poland, Romania, and Slovakia) that have a fraction of foreign population below 1%. We eliminate individuals aged under 18 or over 100 (1,710 observations), and a few individuals who do not report an education level (81 observations). We finally eliminate from the sample all individuals who declare not be citizens of the country in which they live, since we are interested in the opinions of those who can vote (2,022 observations). This reduces our sample to 45,134 individuals from 25 countries.

5.1.1 Measuring Attitudes toward Immigrants

There are several questions about immigration in the ESS. In particular, participants are asked their opinion about immigrants of the same ethnic group as the majority in the host country, about immigrants of a different ethnic group, and about immigrants from poorer countries outside Europe. For instance, the first question is:

To what extent (country) should allow people of the same race or ethnic group as most (country)'s people to come and live here?

This is *imsmetn* variable in the ESS. The four possible answers are: allow many to come and live here (1), allow some (2), allow a few (3), or allow none (4).

The other two questions of interest for us are *imdfetn* (opinion about immigrants of different race or ethnic group as the majority) and *impcntr* (opinion about immigrants from poorer countries outside Europe).[21] Table 1 reports sample frequencies for these three variables.

Insert Table 1 here

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Table 1: Sample frequencies of opinions about immigration (percent)

	Same ethnic group	Different ethnic group	Poor countries
Allow many	23.2	11.3	10.7
Allow some	37.6	33.7	30.6
Allow a few	24.4	32.8	31.9
Allow none	10.4	17.2	20.5
DK/NA	4.3	5.0	6.2
Number of observations	45, 134	45, 134	45, 134

Notes: Data are weighted using both design (*dweight*) and population weights (*pweight*).

Table 2: Sample divided into six groups

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Since we are interested in attitudes toward low-skilled immigrants, we use as an endogenous variable a dummy variable called *proimm* that takes value 1 when the three variables above (*imsmetn, imdfetn,* and *impcntr)* take value 1 or 2, and it is zero otherwise. The mean of *proimm* is .369 (standard deviation is .482).[22]

The first observation we get from the sample is that there is a great deal of heterogeneity across countries with respect to attitudes toward immigration as measured by the *proimm* variable. Figure 1 plots the percentage of individuals who are favorable to allowing new immigrants into the country. The highest value is in Sweden (83.1%) and the lowest in Cyprus (5.7%).

Insert Figure 1 here

We next relate individual attitudes toward immigration with individual characteristics, focusing first on education. We follow Facchini and Mayda (2009) and use the education years (*eduyrs*) variable to gather the effects that work through the labor market. The mean of *eduyrs* is 12.03 and the standard deviation is 4.30.

To measure individual economic status we classify them into three groups, according to their educational attainment: individuals with low education, middle education and high education. Later, we use this classification to test the political process predictions of the model. By using the International Standard Classification of Education (ISCED), individuals are classified into five groups: (i) less than lower secondary education (ISCED 0-1); (ii) lower secondary education completed (ISCED 2); (iii) upper secondary education completed (ISCED 3); (iv) post-secondary non-tertiary education (ISCED 4); (v) tertiary education completed (ISCED 5). Relative frequencies are 16.5%, 13.0%, 31.9%, 3.1%, and 35.4%. We consider group (i) as the low educated, groups (ii) and (iii) as individuals with middle education, and groups (iv) and (v) as highly educated. Figure 2 represents the fraction of individuals with a positive attitude by educational level. We also represent the mean values of the three original questions (*imsmetn, imdfetn,* and *impcntr*). There are striking

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[22]We could alternatively construct a variable that takes value 1 only when *imdfetn* and *impcntr* take value 1 or 2. However, this would be very similar to the one we use. This latter variable has a mean value of .376 (standard deviation .484).

Figure 1: Pro-immigration attitude by country

Country	Value
SE	0.83
NO	0.56
DE	0.54
CH	0.53
HR	0.52
NL	0.52
BE	0.50
IE	0.50
SI	0.45
FR	0.44
GB	0.42
DK	0.40
UA	0.36
ES	0.33
PT	0.33
FI	0.32
RU	0.26
CZ	0.25
TR	0.24
IL	0.22
EE	0.21
LV	0.19
HU	0.11
GR	0.10
CY	0.06

Positive attitude (per cent)
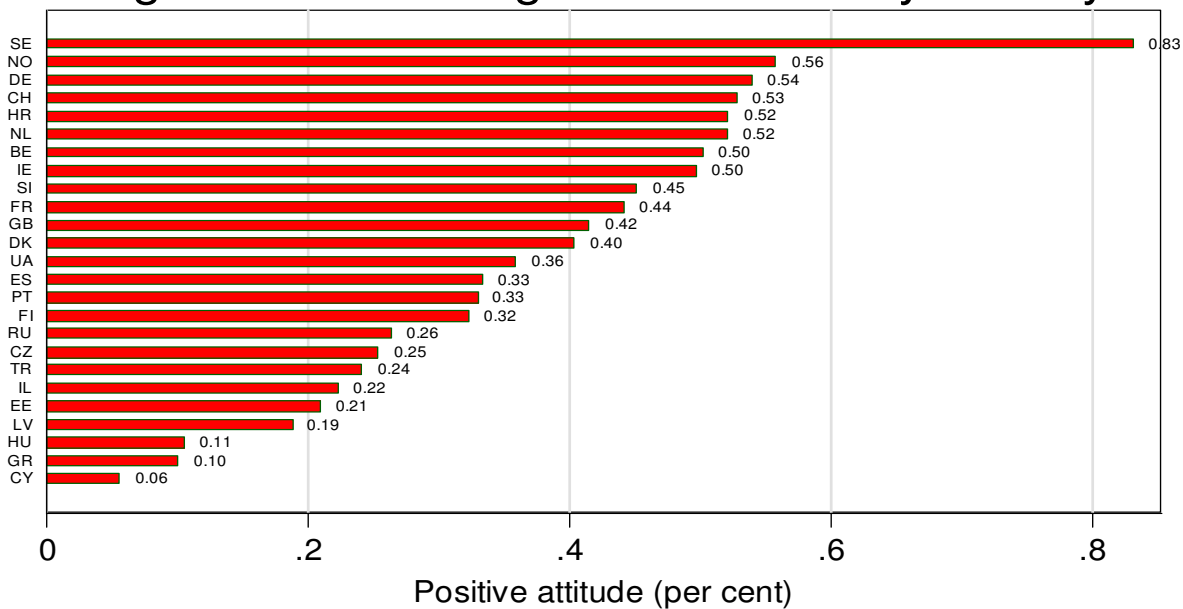
Notes: Weighted data using design weights.

differences across education levels. Mean values of *proimm* range from 22.7% among the low-educated to 35.8% among those with middle education, and to 44.3% among the highly educated. Clearly, individuals are less supportive for immigration when they are asked about immigrants from ethnic groups different from the native ones (*imdfetn*) or from poor countries outside Europe (*impcntr*).

Insert Figure 2 here
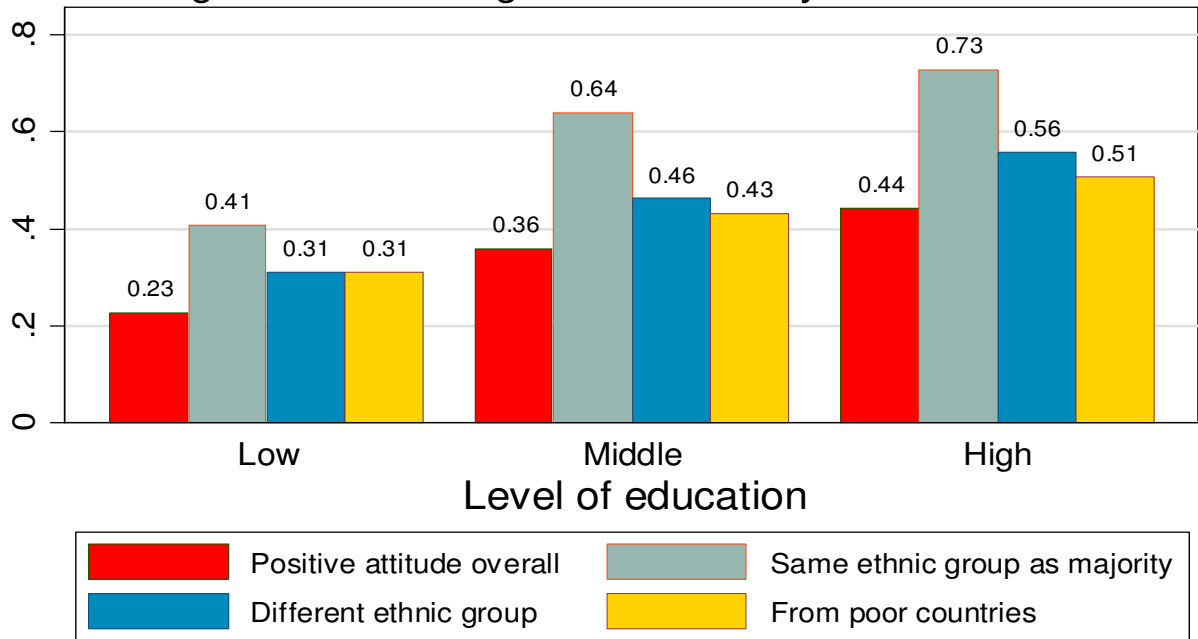
5.1.2 Measuring Attitudes toward Public Spending

In our model, voters decide not only on how many immigrants to allow but also about how much to spend on public goods. We focus on one question in which individuals are asked about whether government should raise or decrease taxes and spending. The exact wording of the question (*ditxssp*) is the following:

Many social benefits and services are paid for by taxes. If the government had to choose between increasing taxes and spending more on social benefits and services, or decreasing taxes and spending less on social benefits and services, which should they do?

Individuals have to choose a number between 0 and 10, where 0 means that government should decrease taxes a great deal and spend much less on social benefits and 10 means government should increase taxes a great deal and spend much more on social benefits and services. If we consider that those who choose a value below 5 want to reduce spending, those who choose 5 want to keep it constant, and those who choose a value above 5 want to increase spending, we find that 29.0% want to reduce spending, 38.3% prefer to keep it constant, while 32.6% want to raise it. Alternatively, we can collapse all the information again into a dummy variable, called *prospending*, that takes value 1 when *ditxssp* takes value 6 or higher. The mean of *prospending* is .3264 (standard deviation is .4689). We find that countries are more homogeneous in attitudes toward expenditure than they are toward immigration. The maximum value of *prospending* is in Cyprus (.5349) and the minimum in Hungary (.1504).

When we divide individuals according to their education levels, we find that those with

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Figure 2: Pro-immigration attitude by education level

Legend:
- Positive attitude overall
- Same ethnic group as majority
- Different ethnic group
- From poor countries

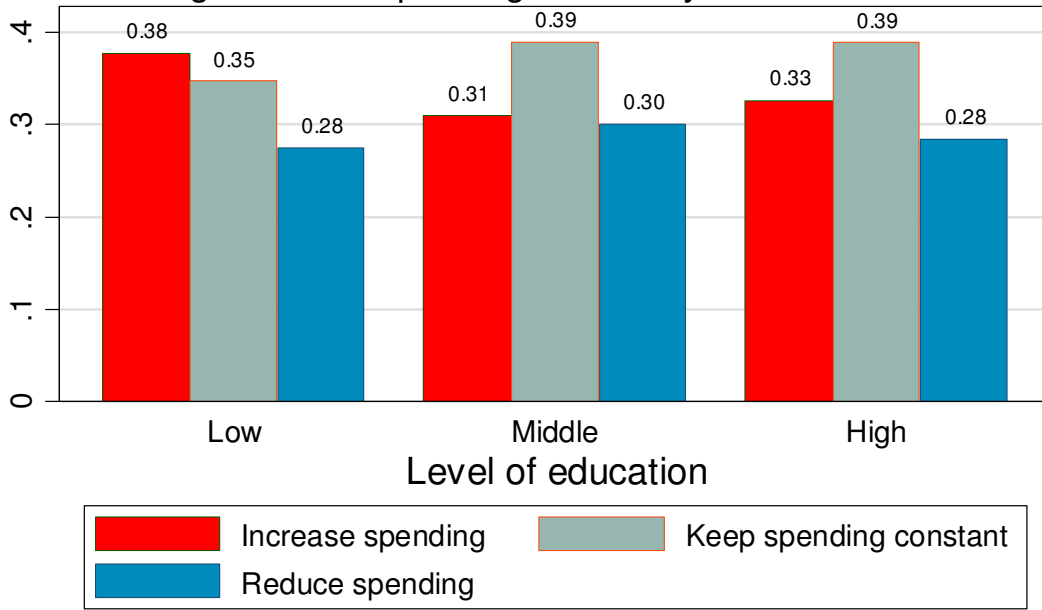Notes: Weighted data using both design and population weights.

low education are more willing to support an increase in spending. However, contrary to the opinions on immigration, we here do not find a monotonic relationship between education levels and attitudes toward increasing spending. As can be seen in Figure 3, the middle-educated individuals are less favorable to increasing spending than the highly educated. This result is not in line with the prediction of our theoretical model. The reason could be that in our model there is only one public good that can be supplemented in the private market. Since typically only the rich will supplement it, our prediction is that, in general, support for public expenditure should decline in income. However, in real life governments provide also many others goods that are disproportionally enjoyed by the middle-class and the rich. Think, for instance, of university education. But the question individuals answer in the survey ("ditxssp") does not distinguish between different types of public expenditure. We represent the percentages of individuals who want to increase spending (in red), to keep it constant (in grey), and to reduce it (in blue), by education level.

Insert Figure 3 here

To test the predictions on welfare-state preferences, we use data on household income, precisely the *hincfel* variable in the sample. Individuals are asked how they feel about household income. Possible answers are: living comfortably on present income (1); coping on present income (2); difficult on present income (3); or very difficult on present income (4). Sample frequencies are 20.86%, 42.71%, 25.73%, and 10.70%. We build a dummy variable, called *lowincome*, that takes value 1 when *hincfel* is either 3 or 4. Using this variable, we find that the mean value of *proimm* is 27.84% for low-income individuals (*lowincome*=1) and it is 41.92% for the rest of individuals.

Another indirect measure of income is captured by the *brwmny* variable. Individuals are asked whether they find difficult to borrow money to make ends meet. Possible answers are: very difficult (1); quite difficult (2); neither easy nor difficult (3); quite easy (4); very easy (5). We build a dummy variable called *borrowconstrained* that takes value 1 when *brwmny* is either 1 or 2. The mean of proimm is 32.90% for individuals who have problems to borrow money (*borrowconstrained*=1) and it is 41.56% for the rest.

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Figure 3: Pro-spending attitude by education level

Notes: Weighted data using both design and population weights.

5.1.3   Interest in Politics

There are also a series of questions about interest in politics. We want to use this information, because not all individuals are equally likely to show up at the election polls. There are two possible sources of information. One is to use the information on whether individuals report to be interested in politics. In particular, individuals have to report how interested in politics are. The variable is *polintr*. Possible answers are: very interested (1), quite interested (2), hardly interested (3), and not at all interested (4). Relative frequencies are 11.14%, 37.84%, 32.75%, and 18.27%. We collapse this information into a dummy variable called *polint* that takes value 1 when *polintr* is either 1 or 2.

Another interesting variable is *vote*. Here individuals are asked whether they voted or not in the last national election. A 76.64% went to vote, a 20.00% did not and a 3.36% were not eligible to vote. In Figure 4 we represent these two variables by education level. It is interesting that although interest in politics increases with education, the same does not happen with voter turnover since those with middle education are the least likely to vote.

Insert Figure 4 here

5.2   Model Specification

The key implication of our theoretical model is that, regardless of which group is more decisive in the political process, as the highly skilled individuals have more influence on policy announcements, the equilibrium outcome has lower tax-expenditure policies and a higher immigration quota. As a result, middle and low-skilled natives should be less tolerant to the arrival of immigrants and more willing to raise taxes to finance public services. To check these implications we do as follows.

For each region at the NUTS-1 level, we compute the fraction of individuals with low, middle and higher education among those who voted in the last election. We perform our analysis at the NUTS-1 level since this allows us to have a reasonable number of observations in each region.[23] We then divide all regions into two groups depending on whether or not the

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[23]We have also performed the whole analysis using countries instead of regions and the main results are

Figure 4: Interest in Politics and Voter turnover by level of education

Interested in Politics | Voted in previous elections
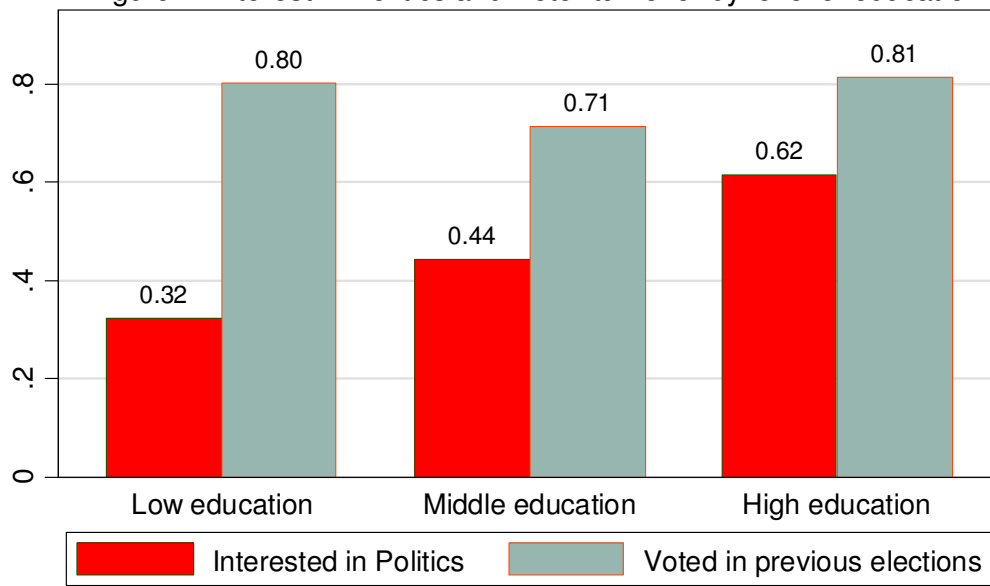
Notes: Weighted data using both design and population weights.

highly skilled make up a majority among voters. This will be the case if the group of highly skilled individuals represents a higher fraction among voters than each one of the other two groups. In 40 out of 107 regions the highly skilled are a majority, while in the remaining 67 regions they are not. Combining this with the information on education levels, we end up dividing our sample into six (disjoint) groups. We illustrate this process in Table 2 below:

Insert Table 2 here

Individuals in our sample are split into six groups, labeled from Group I to Group VI. According to Table 2, the most populous group is Group III, corresponding to individuals with a medium level of education living in regions where the highly skilled are **not** the most influential group. Our approach consists of comparing the opinions on immigration and expenditure **by columns**. That is, conditional on having low education, is there a difference in opinions depending on whether or not the highly skilled are a majority? In other words, we want to compare the opinions of Group I with those of Group II, of Group III with Group IV, and of Group V with Group VI. In particular, our theoretical model predicts that individuals in Group II should be more opposed to immigration and more favorable to raising taxes and expenditure, compared to individuals in Group I. The reason is that those in Group II live in a region where the majority are highly skilled and the implemented policy should be closer to the bliss point of this group and, therefore, more distant from the bliss point of the low and middle-skilled. The same comment applies when we compare Group IV with Group III. Accordingly, we should also observe that highly skilled individuals are more favorable to immigration and more opposed to increases in taxes and expenditure in regions in which they do not make up a majority (Group V), compared to those living in regions in which they are a majority (Group VI). Now the reason is that in the former regions the policy implemented should be close to the bliss point of the low and middle educated

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similar. In our sample there are 107 regions at the NUTS-1 level. In 13 countries of the sample, the whole country is just one region at the NUTS-1 level. These are Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Ireland, Israel, Latvia, Norway, Portugal, Slovenia, and Switzerland.

Table 2: Sample divided into six groups

High-Skilled majority	Education level			Total
	Low	Medium	High	
	(I)	(III)	(V)	
NO	5,574	13,528	6,904	26,006
	(12.3%)	(30.0%)	(15.3%)	(57.6%)
	(II)	(IV)	(VI)	
YES	1,876	6,776	10,475	19,127
	(4.2%)	(15.0%)	(23.2%)	(42.4%)
Total	7,450	20,305	17,379	45,134
	(16.5%)	(45.0%)	(38.5%)	(100%)

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individuals.

Figure 5 represents the average values of our two endogenous variables in each one of the six groups in Table 2. Regarding opinions about immigration, we observe that the predicted pattern holds for the medium and highly skilled groups, since differences are statistically significant at the 5% for these two groups. However, for individuals with low education differences are not statistically significant at the 5% level.[24] Regarding opinions about public expenditure and taxes, the predicted pattern holds for the low and medium-skilled groups, where again differences are statistically different at the 5% level. For the highly skilled differences are not statistically different.[25] However, there are many other factors that may affect individual attitudes for which we are not controlling. This is the next step.

Insert Figure 5 here

We propose to estimate a bivariate Probit model as follows:

$$
\begin{aligned}
y_1^* &= X_1\beta_1 + \epsilon_1, \\
y_2^* &= X_2\beta_2 + \epsilon_2,
\end{aligned}
\tag{24}
$$

where y_1^* and y_2^* are two latent variables related to the binary dependent variables by:

$$
y_j = \begin{cases} 1 & \text{if } y_j^* > 0 \\ 0 & \text{if } y_j^* \leq 0, \end{cases}
\tag{25}
$$

for $j = 1, 2$. The error terms are assumed to be independently and identically distributed as bivariate normal:[26]

$$
\begin{pmatrix} \epsilon_1 \\ \epsilon_2 \end{pmatrix} \sim IIDN \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix} \right).
\tag{26}
$$

Our two binary outcomes have been described in the previous section. The first outcome

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[24]The p-values of the Pearson and Wald tests of differences for the low-education group are 0.262 and 0.270, respectively.

[25]The p-values for both Pearson and Wald tests of differences are 0.2328 for this group.

[26]**However, to allow for arbitrary patterns of correlation within countries, in all of our regressions robust standard errors are clustered at country level.**

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Figure 5: Proimm and Prospending by region type
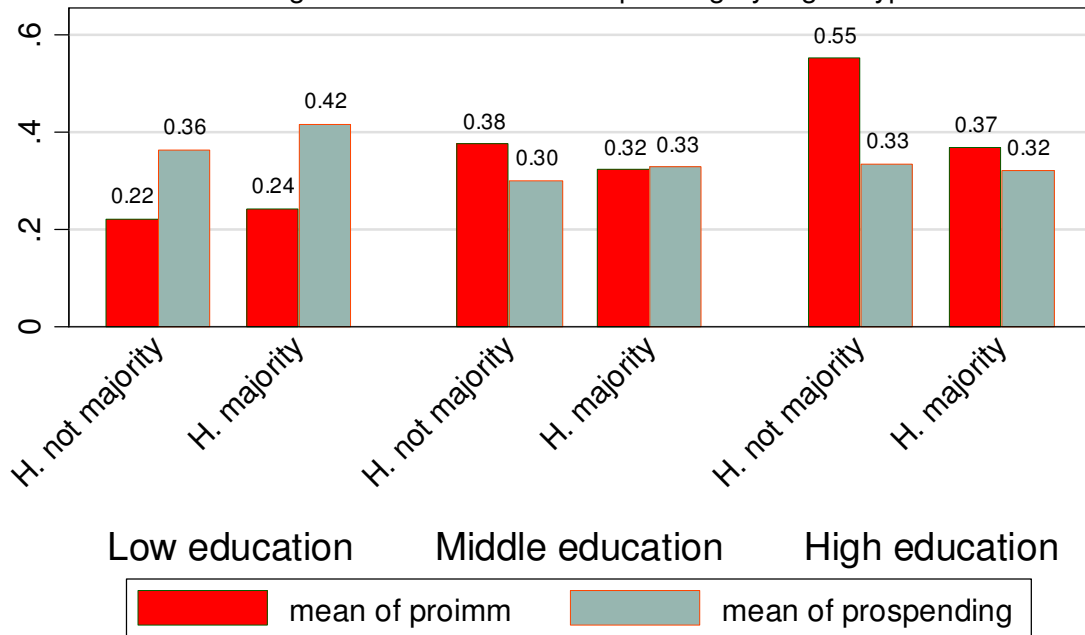
Notes: Weighted data using both design and population weights.

is the *proimm* variable, which takes value 1 when the individual has a positive attitude toward immigration. The second outcome is the *prospending* variable, which equals 1 if the individual is favorable to raise taxes and spending. Because these two binary dependent variables represent two interrelated decisions of individuals a bivariate Probit model seems the natural choice.

Matrices X_1 and X_2 contain our regressors. We consider four different channels through which attitudes toward immigrants are driven. Namely, (i) non-economic channel, (ii) labor-market channel, (iii) welfare-state channel, and (iv) political-process channel.

(i) *Non-economic channel*: We include a number of individual characteristics as age, gender, religion, etc. among our regressors. The Appendix provides details of all the variables we use. Table 3 sets out the summary statistics for all of them. These individual characteristics are included in our two equations. We also include regional dummies in all our regressions to control for regional fixed effects.

Insert Table 3 here

(ii) The *labor market channel* includes years of education (*eduyrs*), and a dummy variable (*unempl*) that equals 1 if the individual is unemployed.

(iii) Concerning the *welfare state channel* we use data on income (*lowincome* and *borrowconstrained*). We also control for individual attitudes toward distributional issues: *progov* (the respondent agrees that governments should reduce income differences) and *socbenpoverty* (the respondent agrees that social services reduce poverty) and for individual attitudes toward political institutions: *trust parliament* (the respondent trusts the parliament) and *health efficient* (the respondent agrees that the provision of health care is efficient).

(iv) *Political-process channel*: Since we have six groups, we need five dummy variables to compare opinions on immigration and public spending among them. We take Group I (see Table 2 above) as the default and we add five dummy variables to our model. The first two dummy variables are *Mideduc* and *Higheduc* and correspond to individuals with medium and higher education, respectively. The remaining three dummy variables are:

1. *L_RHvote*: This variable takes value 1 if the individual has low education and lives in

Table 3: Summary Statistics

Variable	Mean	(Std. Dev.)	Min.	Max.	N
Pro-immigration attitude	0.369	(0.483)	0	1	43217
Pro-spending attitude	5.104	(2.153)	0	10	40988
prospending	0.326	(0.469)	0	1	40988
immgoodeconomy	0.573	(0.495)	0	1	42999
Age	46.858	(17.629)	18	99	45134
Age squared	2506.44	(1756.35)	324	9801	45134
Female	0.539	(0.498)	0	1	45125
Religious	0.618	(0.486)	0	1	44894
Parent born out	0.123	(0.328)	0	1	44891
Born out of country	0.057	(0.232)	0	1	45073
Urban area	0.364	(0.481)	0	1	44974
Believe people is helpful	0.318	(0.466)	0	1	44895
Interest in politics	0.49	(0.5)	0	1	45012
Vote last election	0.766	(0.423)	0	1	44718
Close to a party	0.517	(0.5)	0	1	44071
Low income	0.364	(0.481)	0	1	44790
Problems to borrow	0.514	(0.5)	0	1	43050
Gvt should reduce income differences	0.72	(0.449)	0	1	44384
Trust in parliament	0.503	(0.5)	0	1	44050
Social services reduce poverty	0.523	(0.499)	0	1	43687
Provision of health care efficient	0.437	(0.496)	0	1	44332
Education (years)	12.029	(4.296)	0	48	44755
Unemployed last 3 months	0.264	(0.441)	0	1	44845
Elementary occupation	0.106	(0.308)	0	1	39689
Low education	0.165	(0.371)	0	1	45134
Middle education	0.45	(0.497)	0	1	45134
High education	0.385	(0.487)	0	1	45134
Ideological position	5.093	(2.177)	0	10	38712
Good health	0.566	(0.496)	0	1	45078
Life satisfaction	6.218	(2.543)	0	10	44766
L educ in H educ majority region voter	0.042	(0.2)	0	1	45134
M educ in H educ majority region voter	0.15	(0.357)	0	1	45134
H educ in H educ majority region voter	0.232	(0.422)	0	1	45134
L educ in H educ majority region pol interest	0.06	(0.238)	0	1	45134
M educ in H educ majority region pol interest	0.21	(0.407)	0	1	45134
H educ in H educ majority region pol interest	0.279	(0.448)	0	1	45134

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a region in which individuals with higher education are the majority among those who voted in the last national election. This variable captures the effect of moving from Group I to Group II.

2. *M_RHvote*: This variable takes value 1 if the individual has completed middle education and lives in a region in which individuals with higher education are the majority among those who voted in the last national election. This variable captures the effect of moving from Group III to Group IV.

3. *H_RHvote*: This variable takes value 1 if the individual has higher education and lives in a region in which individuals with higher education are the majority among those who voted in the last national election. This variable captures the effect of moving from Group V to Group VI.

Our theoretical model predicts that the coefficients of these three variables will have a negative sign on our first outcome (attitude to immigration), and a positive sign on our second outcome (attitude to public spending). The regional dummies control for regional-specific factors not captured by the rest of regressors. In particular, they will capture regional effects different from the fact that there is a particular type of majority in the region.

Finally, we control for the ideological position of individuals by using *partisan* (being close to a particular political party) and *lrscale*. Individuals have to choose a position on a left-right scale from 0 to 10. In this way we control for the fact that some individuals can be more biased toward ideological issues than toward economic issues.

Some of the variables used as explanatory variables are probably endogenous. This is clearly the case of both *partisan* and *lrscale*. However this is not problematic since we use them only as control variables with no intention to give them a causal interpretation.

5.3   Results

Table 4 reports the estimations of a bivariate Probit model corresponding to two alternative specifications. Model 1 includes the three dummy variables we have just described (*L_RHvote, M_RHvote* and *H_RHvote*). In Model 2, we present results for an alternative

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model in which, instead of computing majorities among those who voted in the last election, we compute them among those who declare to be interested in politics. These three dummy variables are called *L_RHpolint, M_RHpolint* and *H_RHpolint*, respectively. In the two models we reject the null hypothesis that the two outcome variables are independent of each other. This moves in the direction that preferences regarding immigration and preferences regarding expenditure are jointly determined. In the first model, the estimate of rho is 0.113, and it is significantly different from zero. This indicates that unobservable factors that are positively related to the attitude to immigration are also positively related to the attitude toward public spending.

Regarding the first channel, the variables that have a positive effect on our first endogenous variable (*proimm*) are *peoplehelp*, *parentbornout*, *urban*, and *stflife*. Except for *parentbornout*, they also have a positive effect on our second endogenous variable (*prospending*). The welfare state channel is captured by the *lowincome* variable. Individuals who declare to face difficulties on present income (*lowincome*=1) are more opposed to immigration, and more favorable to raising expenditure and taxes. The variable *eduyrs* seems to pick up the effects of the labor market since its coefficients on both outcomes are positive and significantly different from zero. Regarding the coefficients of our three variables of interest (*L_RHvote, M_RHvote* and *H_RHvote*), we find that all have the predicted sign. It is negative in the equation corresponding to the attitude on immigration and positive in the equation corresponding to the attitude on expenditure. The effect is quite strong in the first equation, since all three coefficients are significant at the 1% level. In the second equation, although the sign we obtain is as predicted, the size of the effect is much smaller. This means that, conditional on each educational level, individuals living in regions where the majority are highly skilled are more opposed to immigration and more favorable to raising expenditure than those who live in regions where a different group has a majority.

Insert Table 4 here

Table 5 reports the estimated marginal effects corresponding to some of the regressors from our Bivariate Probit model to provide an idea of the size of the effects. As is standard

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Table 4: Bivariate Probit estimations

VARIABLES	Model 1 Proimm	Model 1 Prospending	Model 2 Proimm	Model 2 Prospending
Non-Economic Channel				
Age	0.00529	0.00616	0.00525	0.00608
	(0.00606)	(0.00595)	(0.00624)	(0.00597)
Age(squared)	-0.000104	-0.00002	-0.000103	-0.00002
	0.00007	0.00006	0.00007	0.00006
Female	-0.0274	0.0124	-0.0290	0.0128
	(0.0397)	(0.0276)	(0.0396)	(0.0272)
Religious	-0.0121	-0.0290	-0.0102	-0.0284
	(0.0448)	(0.0375)	(0.0449)	(0.0379)
Believe people is helpful	0.193***	0.101***	0.191***	0.101***
	(0.0336)	(0.0341)	(0.0340)	(0.0343)
Parent born out	0.123**	-0.0111	0.120*	-0.0118
	(0.0623)	(0.0677)	(0.0615)	(0.0674)
Born out of country	0.121	-0.0234	0.125	-0.0223
	(0.0769)	(0.0768)	(0.0775)	(0.0757)
Urban area	0.110***	0.0545*	0.112***	0.0547*
	(0.0212)	(0.0312)	(0.0215)	(0.0315)
Life satisfaction	0.0355***	0.0144***	0.0355***	0.0144***
	(0.00788)	(0.00345)	(0.00796)	(0.00344)
Welfare State Channel				
Low income	-0.0486**	0.0565**	-0.0485**	0.0561**
	(0.0210)	(0.0261)	(0.0205)	(0.0259)
Problems to borrow	-0.0511	0.0122	-0.0505	0.0125
	(0.0361)	(0.0267)	(0.0364)	(0.0267)
Gvt should reduce income differences		0.233***		0.234***
		(0.0305)		(0.0304)
Trust in parliament		0.145***		0.145***
		(0.0385)		(0.0383)
Social services reduce poverty		0.0938***		0.0934***
		(0.0202)		(0.0200)
Provision of health care efficient		0.223***		0.223***
		(0.0340)		(0.0341)
Labor Market Channel				
Education (years)	0.0340***	0.00773**	0.0344***	0.00798**
	(0.00894)	(0.00382)	(0.00855)	(0.00390)
Unemployed last 3 months	0.0350	-0.0150	0.0343	-0.0140
	(0.0324)	(0.0470)	(0.0321)	(0.0469)
Political Process Channel				
Middle education	0.0571	-0.0399	0.0214	-0.0560
	(0.0704)	(0.0670)	(0.0673)	(0.0729)
High education	0.307**	0.0377	0.299**	0.0387
	(0.127)	(0.0762)	(0.119)	(0.0928)
L educ in H educ majority region voter / Political interest	-0.851***	0.205*	-0.889***	0.161
	(0.0870)	(0.117)	(0.0998)	(0.115)
M educ in H educ majority region voter / Political interest	-0.689***	0.106	-0.694***	0.128*
	(0.0695)	(0.0779)	(0.0700)	(0.0735)
H educ in H educ majority region voter /	-0.873***	0.0934**	-0.886***	0.0818*

Political interest	(0.0515)	(0.0436)	(0.0554)	(0.0438)
Close to a party	0.106**	0.102***	0.106**	0.102***
	(0.0535)	(0.0281)	(0.0531)	(0.0282)
	-		-	
Ideological position	0.0699***	-0.0380*	0.0702***	-0.0381*
	(0.0188)	(0.0204)	(0.0187)	(0.0202)
Constant	-0.616***	-1.264***	-0.596***	-1.258***
	(0.174)	(0.235)	(0.193)	(0.239)
Observations	31,941		31,941	
Rho	0.113***		0.113***	

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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in the literature, we report the average marginal effects, although marginal effects at the means are quite similar.

In Column 1, we report the marginal effect for the marginal probability of the first outcome (opinion on immigration) from Model 1 and Column 2 reports the marginal effect for the marginal probability of the second outcome (opinion on taxes and spending), also from Model 1. In columns 3 and 4 we report the corresponding marginal effects of Model 2. For instance, the marginal effect of *eduyrs* in the first column (0.0114) means that for every additional year of education, the probability of a positive attitude toward immigration raises a 1.14%. The marginal effects of our variables of interest are quite strong. Consider first those individuals with a low level of education (first column in Table 2). We find that, on average, those in Group II are a 28.6% less favorable toward immigration compared to those in Group I, and a 6.9% more favorable to increasing taxes and expenditure. We find a similar result when we compare individuals in Group IV with those in Group III, although the marginal effect on *prospending* is not statistically significant.

The marginal effect of *H_RHvote* (-0.293) tells us that high educated individuals living in regions where they are not a majority have a higher probability of being in favor of immigration, with the increase in probability being a 29.3%. At the same time our estimations suggest that this group is more favorable (a 3.16% more) to increase taxes and expenditure.

Insert Table 5 here

We want to end this section by studying the following question. We have found strong differences in the opinions on immigration and public policy when we compare regions with different majorities, after controlling for observables. The only observable difference between individuals in Group I and those in Group II (see Table 2) is the identity of the majority group in the region. If politicians tend to satisfy the will of the majority, it must be that individuals in Group I face an implemented policy that differs from the one faced by individuals in Group II. Now, if this were true, we should observe that in those regions where the highly skilled are a

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Table 5: Marginal effects after bivariate probit

VARIABLES	Model 1		Model 2	
	Proimm	Prospending	Proimm	Prospending
Non-Economic Channel				
Age	-0.00144***	-0.00134***	-0.00144***	-0.00135***
Believe people is helpful	0.0647***	0.0342***	0.0642***	0.0341***
Parent born out	0.0412**	-0.00377	0.0403**	-0.00401
Urban area	0.0371***	0.0185*	0.0375***	0.0185*
Life satisfaction	0.0119***	0.00489***	0.0119***	0.00489***
Welfare State Channel				
Low income	-0.0163**	0.0191**	-0.0163**	0.0190**
Gvt should reduce income differences		0.0789***		0.0791***
Trust in parliament		0.0490***		0.0490***
Social services reduce poverty		0.0318***		0.0316***
Provision of health care efficient		0.0754***		0.0755***
Labor Market Channel				
Education (years)	0.0114***	0.00262**	0.0116***	0.00270**
Political Process Channel				
Middle education	0.0192	-0.0135	0.00718	-0.0190
High education	0.103**	0.0128	0.100**	0.0131
L educ in H majority region voter / pol. interest	-0.286***	0.0693*	-0.299***	0.0546
M educ in H majority region voter / pol. Interest	-0.231***	0.0358	-0.233***	0.0432*
H educ in H majority region voter / pol. Interest	-0.293***	0.0316**	-0.297***	0.0277*
Close to a party	0.0356**	0.0346***	0.0354**	0.0345***
Ideological position	-0.0235***	-0.0129*	-0.0236***	-0.0129*

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

majority, indeed it is the case that the implemented policy entails a large immigration quota. To test this, we could compare which is the policy implemented in regions with different political majorities. To do this, we would need information on the fraction of immigrants living in each region. Another interesting possibility is to use a variable available in the ESS that gives information on the individual perceptions about the number of immigrants. In particular, individuals are asked the following question (*brnocnt*):

Of every 100 working age individuals, how many are born outside the country?

Individuals have to choose an interval among the following: [0-4], [5-9], [10-14], [15-19], [20-24], [25-29], [30-34], [35-39], [40-44], [45-49], [50 or more]. Typically individuals tend to over-estimate the number of immigrants around. Figure 5 below represents the means of *proimm* and *brnocnt* by education level, dividing the regions into two groups: those where the majority are highly skilled and those where they are not.[27] We find that the three groups of individuals perceive a higher proportion of immigrants when they live in regions where the majority are highly skilled among voters, compared to the other regions. In particular, this effect is more pronounced among low-educated individuals.[28]

Insert Figure 6 here

Our analysis seems to suggest that policies conform to the will of the majority. Since typically highly skilled individuals are more favorable to immigration, regions where they are a majority will implement a policy with a higher immigration quota and a lower level of expenditure than regions in which that group are not a majority. In turn, this implies that in those regions the low and middle skilled will be more opposed to admit more immigrants (compared regions where the highly skilled are not a majority) and more favorable to raising taxes and expenditure.

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[27] We divide the variable *brnocnt* by 11 to make both variables comparable.

[28] We find a similar result when we use the percentage of foreign-born (unskilled) individuals in the sample, instead of the information in the variable *brnocnt*.

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Figure 6: Immigration attitudes and perceptions by region type
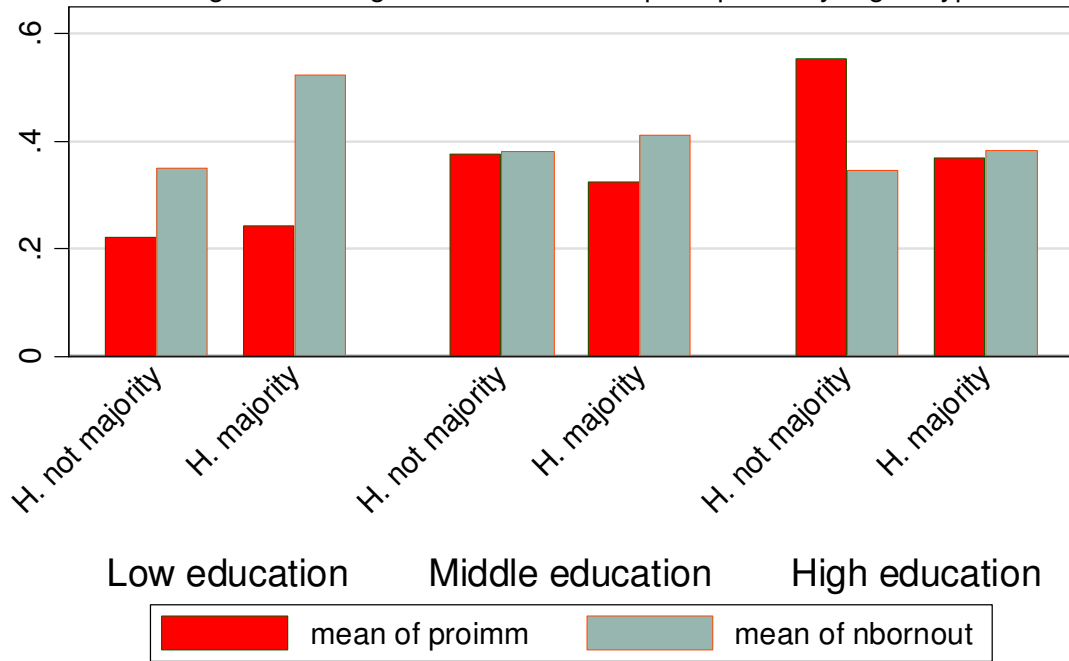
6 Robustness Checks

6.1 Alternative Specifications

In this section, we propose to estimate a model with only one equation in which the dependent variable is *proimm*, considering the variable that measures the attitude toward public spending among the regressors. Clearly, according to our theoretical model we face the problem that this regressor is potentially endogenous. To correct for endogeneity we propose to instrument this regressor with several variables. This set of controls includes variables that do not seem to have a direct effect on our endogenous variable.

Let y_1^* be a dependent variable in the structural equation (27) below, while y_2 is an endogenous regressor in this equation. The latent variable y_1^* is related to our dummy variable *proimm* and variable y_2 measures how much an individual i is willing to increase or decrease taxes to finance public expenditures. This is the variable called *ditxssp* in the *ESS*, see Section 5.1.2. Our proposed model to estimate is:

$$y_1^* = \gamma y_2 + x_1'\beta + u, \tag{27}$$

$$y_2 = X\Pi + v, \tag{28}$$

with $X = (x_1, x_2)$ and $\Pi = [\pi_1, \pi_2]$. The vector x_1 includes exogenous regressors that capture the effects from the labor market, those effects coming from the political process as well as those non-economic determinants of attitudes toward immigrants, while x_2 is a vector of additional instrumental variables that determine y_2. These instruments are the variables *progov, trustparliament, socbenpoverty,* and *healthefficient* that we described in Section 5.2. We assume that $(u, v) \sim N(0, \sum)$, with $\sum = (\sigma_{i,j})$ and $\sigma_{11} = 1$.

A second alternative is to estimate a simple Probit model in which we assume that the variable y_2 (*ditxssp*) is exogenous. Finally we also estimate a linear probability model. Table 6 presents the estimated marginal effects corresponding to the two Probit models, together with the estimated coefficients of the linear model. Overall the estimated coefficients of our

variables of interest are remarkably similar to those in the bivariate Probit model. We find evidence in favor of both the labor market hypothesis and the political process hypothesis. We see that having a positive attitude towards spending has a positive influence on the probability of being favorable to the arrival of immigrants. On the other hand, we observe that the marginal effect of *ditxssp* is much weaker when we take it as exogenous. This has the interpretation that disregarding endogeneity problems underestimates the effects of the welfare-state channel.

Insert Table 6 here

6.2 Workers versus Non-workers

How do we know that variables $L-RHvote$, $M-RHvote$, $H-RHvote$ do pick out the effects that work through the political process and that the *Education years* variable measures labor market skills? Our theoretical model shows that the distributional impact of immigration determines native demand for immigration policy (this is the first term of Equation 10). While this is valid for those individuals who are in the labor force, preferences regarding immigration policy of those not in the labor force may be determined by some other non-economic factors. If we are correct, the explanatory power of $L-RHvote$, $M-RHvote$ and $H-RHvote$ should vary between these two groups of natives. Something similar should be observed with the *Education years* variable. To test if it is the case, we follow Scheve and Slaughter (2001) in running two separate bivariate Bivariate Probit models, one for the subsample of natives in the labor force and the other for those not in the labor force.

We use the information contained in the variable *mnactic* (main activity last day). Possible answers are: paid work (01), education (02), unemployed looking for a job (03), unemployed not looking for a job (04), permanently sick/disabled (05), retired (06), community and military service (07), housework (08), and other (09). We assume that groups 01 and 03 are in the labor force, while group 02 and groups 04 to 08 are not in the labor force. According to this classification there are 24,619 in the labor force and 19,787 not in the labor force. Retired individuals represent a 52.6% of those not in the labor force, while

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Table 6: Marginal Effects after IV-Probit, Probit, and LPM

VARIABLES	IV-Probit	Probit	LPM
Non-Economic Channel			
Age	-0.00198***	-0.00160***	-0.00168***
Believe people is helpful	0.0398***	0.0608***	0.0628***
Parent born out	0.0403**	0.0430**	0.0468**
Urban area	0.0227**	0.0334***	0.0332***
Life satisfaction	0.00818***	0.0111***	0.0107***
Welfare State Channel			
Pro-spending attitude	0.0748***	0.0177***	0.0182***
Low income	-0.0172***	-0.0179**	-0.0156**
Labor Market Channel			
Education (years)	0.00889***	0.0104***	0.0105***
Political Process Channel			
Middle education	0.0226	0.0251	0.0137
High education	0.0916***	0.114***	0.111***
L educ in H educ majority region voter	-0.284***	-0.264***	-0.291***
M educ in H educ majority region voter	-0.226***	-0.217***	-0.238***
H educ in H educ majority region voter	-0.278***	-0.291***	-0.315***
Close to a party	0.0177	0.0297*	0.0308*
Ideological position	-0.0149***	-0.0218***	-0.0223***

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housework are a 21.1% and those still in education are a 16.9%. Table 7 presents the results for these two subsamples separately. These results confirm that the impact of $L - RHvote$, $M - RHvote$ and $H - RHvote$ is related to the political process and that *Education years (eduyrs)* measures labor market skills. Since for the labor force subsample, the variables that work through the political process are strongly significant, and their estimated coefficients on our first variable (*proimm*) are larger than those of the full sample. We find an interesting pattern in our second equation (*prospending*) since the coefficients of our three variables of interest change sign. In the subsample of individuals in the labor force, the three coefficients are positive and strongly significant. However, in the subsample of individuals not in the labor force, the three coefficients are negative. One possible explanation for the flip in signs of the coefficients with respect to preferences for public expenditure could be related with differences between retired individuals and individuals in the labor force. Retired individuals may not benefit from many social benefits (public education, unemployment benefits, etc.) and hence they could prefer lower tax-expenditure policies. Another possibility could be that retired people living in "high-majority" regions are wealthier than those living in regions where the low or the medium-educated individuals are a majority. Therefore, a retired individual living in a region where the high are a majority is less willing to bear a rise in the tax rate compared to someone living in a (relatively) poorer region.

In the case of *eduyrs*, its estimated coefficient is also larger when we focus on those in the labor force. All this seems to confirm that our results work mainly through those individuals who are active in the labor force.

Insert Table 7 here

7   Conclusions

This paper applies a political economy approach to explain how the interplay between immigration process, labor-market concerns, and welfare-state considerations jointly determine the shape of native preferences regarding immigration and tax-expenditure policies. A key

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Table 7: Bivariate Probit estimations, workers vs. Non-workers

VARIABLES	Labor Force		Out of Labor Force	
	Proimm	Prospending	Proimm	Prospending
Non-Economic Channel				
Age	0.0181	0.00425	-0.00963	0.0108*
	(0.0124)	(0.00959)	(0.00688)	(0.00655)
Age(squared)	-0.000228	0.000007	-0.00003	-0.00009
	(0.000139)	(0.000102)	-0.00007	-0.00006
Female	-0.0448	-0.0242	-0.0540*	0.00107
	(0.0499)	(0.0344)	(0.0323)	(0.0264)
Religious	-0.00200	-0.0548	-0.0147	0.0152
	(0.0404)	(0.0507)	(0.0631)	(0.0288)
Believe people is helpful	0.197***	0.121**	0.203***	0.0828**
	(0.0391)	(0.0542)	(0.0307)	(0.0343)
Parent born out	0.175***	-0.0399	0.0634	0.0501
	(0.0601)	(0.0486)	(0.0910)	(0.104)
Born out of country	0.0590	0.0136	0.207***	-0.0699
	(0.121)	(0.0575)	(0.0579)	(0.122)
Urban area	0.0793**	0.0452	0.147***	0.0622
	(0.0391)	(0.0400)	(0.0337)	(0.0486)
Life satisfaction	0.0372***	0.0201***	0.0358***	0.0102**
	(0.0124)	(0.00655)	(0.0114)	(0.00513)
Welfare State Channel				
Low income	-0.0873***	0.0387*	0.00886	0.0847*
	(0.0246)	(0.0234)	(0.0423)	(0.0494)
Problems to borrow	-0.0417	0.00255	-0.0577*	0.00249
	(0.0458)	(0.0262)	(0.0348)	(0.0280)
Gvt should reduce income differences		0.222***		0.229***
		(0.0292)		(0.0490)
Trust in parliament		0.175***		0.109***
		(0.0546)		(0.0303)
Social services reduce poverty		0.105***		0.0778*
		(0.0368)		(0.0417)
Provision of health care efficient		0.222***		0.227***
		(0.0269)		(0.0593)
Labor Market Channel				
Education (years)	0.0366***	0.0106	0.0244**	0.00315
	(0.0114)	(0.00829)	(0.00983)	(0.0113)
Unemployed last 3 months	0.0308	-0.0207	0.0995	0.0337
	(0.0304)	(0.0462)	(0.0693)	(0.0610)
Political Process Channel				
Middle education	0.0654	-0.0127	0.194***	0.00280
	(0.107)	(0.0782)	(0.0620)	(0.0626)
High education	0.419***	0.0668	0.284*	0.0881
	(0.135)	(0.0836)	(0.167)	(0.113)
L educ in H educ majority region voter	-0.919***	0.778***	-0.614***	-0.374***
	(0.118)	(0.102)	(0.0766)	(0.106)
M educ in H educ majority region voter	-0.730***	0.511***	-0.597***	-0.367***
	(0.0965)	(0.0808)	(0.104)	(0.0729)
H educ in H educ majority region voter	-1.009***	0.551***	-0.625***	-0.426***

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	(0.0590)	(0.0558)	(0.0964)	(0.0577)
Close to a party	0.102	0.0825**	0.0911	0.130***
	(0.0625)	(0.0367)	(0.0746)	(0.0251)
Ideological position	-0.0726***	-0.0506**	-0.0670***	-0.0277
	(0.0205)	(0.0255)	(0.0162)	(0.0183)
	(0.0345)	(0.0363)	(0.0451)	(0.0136)
Constant	-0.925***	-1.371***	-0.328*	-1.198***
	(0.339)	(0.321)	(0.197)	(0.274)
Observations	18,592	18,592	12,899	12,899
Rho	0.0949***		0.138***	

Notes: Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

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prediction of our theoretical model is that as the rich class becomes more politically influential, the resulting political equilibrium outcome has lower public spending and larger immigration quotas. As a consequence, the more influential the rich group is, the higher the opposition will be against immigration among low and middle-skilled natives. That is, we find more polarization of opinions on immigration in regions in which the rich group dominates.

To test these implications we use data on 25 countries from the 2008 wave of the European Social Survey. Departing from the existing literature, we estimate the (economic and non-economic) drivers of individual preferences regarding immigration policies, taking explicitly into account the connection between welfare-state preferences and immigration preferences. We find that individual skills and welfare-state preferences have a positive influence on the probability of being more favorable to immigration, while individual employment status seems to have no significant effect. Our results show that, in general, welfare state and political process channels seem to have a higher impact on preferences regarding immigration, compared to labor market channel and non-economic variables.

Our main point is that the traditional variables that have been used in the literature to explain the variation in attitudes toward immigration among individuals need to be supplemented with details on the type of political majority in the region and in the country. Since different majorities yield different policies, opinions among income groups should reflect these differences in implemented policies.

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Appendix: Description of variables in the text

We describe all the variables used in our estimations (names in bold type). We exclude those already discussed in the text. All variables in italics are from ESS, 2008 wave.[29]

- Believe people is helpful (**peoplehelp**): dummy variable that is 1 when *pplhlp* is above 5. Variable *pplhlp* is the answer to "Most of the time people helpful or mostly looking out for themselves." Answers go from 0 ("Most mostly look out for themselves") to 10 ("People mostly try to be helpful").

- Parent born out (**parentbornout**): dummy variable that is 1 when either the father (*facntr* is 2) or the mother (*mocntr* is 2) was not born in the country.

- Born out of country (**bornout**): dummy variable that equals 1 when the individual was not born in the country (*brncntr* is 2).

- Urban area (**urban**): dummy variable that equals 1 when the individual lives in a big city (*domicil* is 1) or in the suburbs or outskirts of a big city (*domicil* is 2).

- Government should reduce income differences (**progov**): dummy variable that equals 1 when *gincdif* is 1 or 2. Variable *gincdif* is the answer to "Government should reduce differences in income levels." Possible answers are 1 ("Agree strongly"), 2 ("Agree"), 3 ("Neither agree nor disagree"), 4 ("Disagree"), and 5 ("Disagree strongly").

- Social services reduce poverty (**socbenpoverty**): dummy variable that equals 1 when *sbprvpv* is 1 or 2. Variable *sbprvpv* is the answer to "Social benefits/services prevent widespread poverty." Possible answers are 1 ("Agree strongly"), 2 ("Agree"), 3 ("Neither agree nor disagree"), 4 ("Disagree"), and 5 ("Disagree strongly").

- Trust in parliament (**trustparliament**): dummy variable that equals 1 when *trstprl* is above 4. Variable *trstprl* is the answer to "Trust in country's parliament." Possible answers go from 0 ("No trust at all") to 10 ("Complete trust").

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[29] For more details, go to:
http://ess.nsd.uib.no/ess/round4/

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- Provision of health care efficient (**healthefficient**): dummy variable that equals 1 when *hlthcef* is above 5. Variable *hlthcef* is the answer to "Provision of health care, how efficient." Possible answers go from 0 ("Extremely inefficient") to 10 ("Extremely efficient").

- Unemployed last 3 months (**unempl**): dummy variable that equals 1 when *uemp3* is 1. Variable *uemp3* is 1 when the individual has been ever unemployed and seeking for a work for a period of more than three months.

- Ideological position (**lrscale**): categorical variable that reflects placement on left to right scale. Possible categories go from 0 (Left) to 10 (Right).

- Close to a party (**partisan**): dummy variable that equals 1 when *clsprty* is 1. Variable *clsprty* is 1 when the individual declares that she feels closer to a particular political party.

- Life satisfaction (**stflife**): categorical variable that reflects the answer to "How satisfied with life as a whole." Possible categories go from 0 (Extremely dissatisfied) to 10 (Extremely satisfied).

- Good health (**healthy**): dummy variable that equals 1 when *health* is 1 or 2. Variable *health* is the answer to "Subjective general health." Possible answers are 1 ("Very good"), 2 ("Good"), 3 ("Fair"), 4 ("Bad"), and 5 ("Very bad").

- Elementary occupation (**manualworker**): dummy variable that equals 1 when *iscoco* is greater or equal than 9,000. Variable *iscoco* is a 4-digit coding of occupations.

- Perception of immigrants (**brnocnt**): categorical variable that reflects the answer to "Of every 100 working age how many born outside country." Individuals have to choose a bracket out of 11 possible brackets. Each bracket is coded with a number. These brackets are 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 or more. Codes go from 1 to 11.

- Immigration good for the economy (**immgoodeconomy**): dummy variable that equals 1 when *imbgeco* is above 4. Variable *imbgeco* is the answer to "Immigration bad or

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good for country's economy." Possible answers go from 0 ("Bad for the economy") to 10 ("Good for the economy"). This is an alternative endogenous variable to the one we use in the text (*proimm*).

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