Voting over Selective Immigration Policies with Immigration Aversion*

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Abstract

The claim that "skilled immigration is welcome" is often associated to the increasing adoption of selective immigration policies. I study the voting over differentiated immigration policies in a two-country, three-factor general equilibrium model where there exist skilled and unskilled workers, migration decisions are endogenous, enforcing immigration restriction is costly, and natives dislike unskilled immigration. According to my findings, decisions over border closure are made to protect the median voter when her capital endowment is sufficiently small. Therefore I argue that the professed favour for skilled immigration veils the protection for the insiders. This result is confirmed by the observation that entry is rationed for both and unskilled workers. Moreover, immigration aversion helps to explain the existence of entry barriers for unskilled workers in countries where the majority of voters is skilled.

Keywords: immigration policy, multidimensional voting, Condorcet winner.

Jel classification: D72, F22, J18.

1 Introduction

Decisions over immigration policy are a major problem for developed countries. Aggregate shocks -such as regional conflicts and long-term climate changes- and persistent wage differentials foster both constrained and voluntary migration.

In the EU the importance of immigration aversion is increasing. Representative democracies, as a consequence, are moving towards a stricter border enforcement, as reported by Boeri and Bruckner (2005).

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A well developed literature is concerned with voting over immigration restriction. Nonetheless, the study of *selective* policies as a result of a voting process has received comparatively little attention. In order to shed light on this issue, we have to drop the assumption that workers are homogeneous, and we need to introduce skilled and unskilled labour as different production factors. This fairly complicates the analysis, because the effects of immigration can be less intuitive when two factors are entering (leaving) a country and, moreover, it implies a majority decision along two dimensions when voting over the entry policy.

Some important attempts is in this direction are in Grether et al. (2001) and Bilal et al. (2003). They analyse attitudes towards immigration in an economy open to international trade. These authors use a factor-specific technology to study how immigration affects the individual income for both skilled and unskilled workers in presence of capital mobility. However, their attention is focused on the outcome of a referendum rather than on the selection of a Condorcet winner.

Remarkably, in the literaure the costs associated to a restrictive immigration policy are rarely considered[1]. Such costs include -for example- the funding of an Immigration Department and of frontier stations, the creation of the necessary databases, the detection and repatriation of illegal immigrants and so on[2]. The unlikely result is that voters choose corner solutions where they prefer either an open immigration or no immigration at all (for a clear example, see Benhabib 1996)[3]. In this paper workers must pay a tax in order to finance the border enforcement, and interior solutions emerge naturally.

Finally, decisions over immigration depend crucially on a variety of sociocultural factors as well (Scheve and Slaughter 2001; O' Rourke and Sinnott, 2006). While the literature is focused on the redistributional problem, little attention has been paid to introduce immigration aversion in formal models, in spite of the overwhelming empirical evidence in favour of its importance. To mention but a few, Dustmann and Preston (2000) find that racial discrimination is by far the most important factor to explain opposition to immigration in the U.K.; O' Rourke and Sinnott (2004), using survey evidence for 24 countries, show that attitudes towards immigration are affected by nationalist sentiments. See also Gang, Rivera-Batiz and Yun (2001).

In this paper I introduce immigration aversion into the voters' preferences. There are many reasons why individuals may dislike immigration, including concerns for preserving the national cultural identity, the traditional religion,

[1] Ethier (1986) argues that "since border enforcement requires real resources, it must be financed". Bucci and Tenorio (1996) try to estimate the welfare effects of different methods to finance the enforcement budget. However, these papers do not consider the voting process behind the decision.

[2] In Italy, the costs associated to the management of immigration flows were approximately 145 millions euro in 2004 and 206 millions euro in 2003 (Chiarotti and Martelli, 2005).

[3] Ortega (2005) needs intergenerational altruism without bequests to leave out corner solutions for immigration policies. If bequests were allowed, parents had a direct instrument to affect their offspring's utility, and intergenerational transfers would be maximized with unlimited entry of unskilled workers.

or feelings of increased insecurity[4].

The model presented in this paper obtains a selective immigration policy as the result of a bidimensional voting process that assigns different probability of entry to skilled and unskilled workers. Moreover, as explained above, the paper also takes into account both the cost of enforcing the borders and the immigration aversion.

The results show that selective policies, instead of "welcoming" skilled immigration, can be interpreted as a form of protectionism, where a skilled median voter decides the extent of the entry rationing. In other words, the entry requirements are set high enough to protect the median voter from the competition.

On the other hand, the role of immigration aversion is useful to explain why societies with a majority of educated individuals restrict the entry of a complementary factor (unskilled work).

The paper is organized as follows: after this Introduction, Sections 2 and 3 describe, respectively, the characteristics of the destination and of the origin country. Section 4 introduces the borders enforcement costs, and in Section 5 I present the immigration policy and the formalization of the emigration decision. Section 6 studies the voting over selective immigration policies, and section 7 reports some examples of selective policies and some statistics on the educational attainment in several origin and destination countries. The conclusions are summarized in Section 8. The proofs are gathered in the Appendix.

2 Destination Country

D includes a given population of skilled workers (S_D) and unskilled workers (U_D). Each worker, skilled or unskilled, is endowed with a unit of labor supplied inelastically in a competitive labor market. The production technology is

$$Y_D = F(U, S, K) \tag{1}$$

where Y_D is a homogeneous consumption good. K, S and U stand, respectively, for aggregate capital, skilled and unskilled labor. $F(U, S, K)$ exhibits the usual neoclassical features: it is CRS, smooth and strictly concave; moreover, given K, when $U = S$ the marginal product of skilled workers is higher than that of unskilled workers.

For simplicity, only skilled workers are endowed with capital, denoted k_j ($j = 1, 2, ...S_D$). k_j is distributed according to the continuous function $n(k)$ defined over $[\underline{k}, \bar{k}]$, with $\underline{k}, \bar{k} > 0$; $\bar{k}$ can be arbitrarily high and $\underline{k}$ can be

[4] For example, according to a poll, in April 2007 34.6% Italians consider immigration as a danger for the national identity. In 2005, the figure was 26.6. Similarly, the share claiming that immigration is a danger for security and public order has increased from 39.2% (2005) to 43.2 (april 2007). *La Repubblica*, 05/06/2007.

arbitrarily small[5]. The aggregate capital (K) is given by

$$K = \int_{\underline{k}}^{\bar{k}} n(k)\, k dk \tag{2}$$

and the total natives of D (L_D) are

$$L_D = U_D + S_D = U_D + \int_{\underline{k}}^{\bar{k}} n(k)\, dk \tag{3}$$

3 Origin Country

O is populated by skilled workers (S_O) and unskilled workers (U_O). For simplicity, we suppose that O is a poor country, and that it has no capital. Agents living in O also supply inelastically one unit of labor in a competitive labor market. A homogeneous consumption good Y_O is produced out of a CRS technology $G(U, S)$ using only unskilled and skilled labor (U and S):

$$Y_O = G(U, S) \tag{4}$$

$G(U, S)$ has the same standard properties of $F(U, S, K)$[6]. Since there is no capital, for a given (U, S) the marginal productivity is lower than in D.

An important characteristic of the literature on migrations is the assumption that consuming at home yields a higher utility. This assumption is essential to explain why current emigration flows are indeed *low*, given the existing wage differentials. For example, Ramos (1992) shows that only 25% of Puerto Ricans migrate to the US even though they are entitled to free mobility to the U.S. According to Borjas (1999) this is a proof that "important non-economic factors help to restrain migration flows". These restraining factors include, for example, differences in language and culture and the psychic costs of entering an alien environment. In the present model, the preference for domestic consumption is denoted by the parameters θ_S, θ_U for skilled and unskilled workers respectively. Workers are heterogeneous with respect to their preference for home consumption, and the distributions of (θ_S, θ_U) are given by the continuous and differentiable functions $i(\theta_S)$, $i(\theta_U)$ defined, respectively, over $[\underline{\theta}_S, \bar{\theta}_S] \in A$ and $[\underline{\theta}_U, \bar{\theta}_U] \in A$, with $A \subset R$ [7]. For any θ_S, θ_U, $i(\theta_S)$ and $i(\theta_U)$ give, respectively, the number of skilled and unskilled workers endowed with that value of the parameter. The cumulative distributions are indicated by $I(\theta_S)$ and $I(\theta_U)$,

[5] Since unskilled workers are a minority in destination countries, they cannot determine the final voting outcome. Therefore, complicating the model would be of little use.

[6] It is useful to recall that stadard production functions like (1) and (**??**) are analytic, i.e. they can be developed in a convergent Taylor series in any point of their domains. This property will be used to prove Lemma 1.

[7] It is assumed that $\underline{\theta}_S > 1$ and $\underline{\theta}_U > 1$ because any agent is supposed to have a higher utility at home. In general, $\underline{\theta}_S$ and $\underline{\theta}_U$ might be smaller than unity, depicting agents who prefer consuming abroad. On the other hand, $\bar{\theta}_S$ and $\bar{\theta}_U$ can be arbitrarily high.

where

$$I(\theta_S) = \int_{\underline{\theta}_S}^{\theta_S} i(\theta_S)\, d\theta_S; \tag{5}$$

$$I(\theta_U) = \int_{\underline{\theta}_U}^{\theta_U} i(\theta_U)\, d\theta_U \tag{6}$$

obviously, we have $\frac{dI(\theta_S)}{d\theta_S} = i(\theta_S)$ and $\frac{dI(\theta_U)}{d\theta_U} = i(\theta_U)$.

The natives of O are, then[8],

$$A_O = S_O + U_O = I(\bar{\theta}_S) + I(\bar{\theta}_U). \tag{7}$$

By using a simple linear representation, it is possible to characterize the utilities in O and D as follows:

$$u_S(c, \theta_S) = \begin{cases} \theta_S c_O & \text{(consumption in } O) \\ c_D & \text{(consumption in } D) \end{cases} \quad \text{(skilled workers)} \tag{8}$$

$$u_U(c, \theta_U) = \begin{cases} \theta_U c_O & \text{(consumption in } O) \\ c_D & \text{(consumption in } D) \end{cases} \quad \text{(unskilled workers)}$$

where c_O and c_D are, respectively, consumption in O and D. When deciding whether to migrate or not, the agent compares domestic utility to utility abroad. Therefore, pre-migration heterogeneity does not translate into any post-migration heterogeneity.

4 Enforcement Cost

The immigration policy in D can be summarized by the pair

$$\begin{aligned} \pi_S &\in [0, 1] \\ \pi_U &\in [0, 1] \end{aligned} \tag{9}$$

which captures the degree of "border openness".

As explained in the Introduction, I argue that since any barrier to entry has to be effective, it requires some enforcement. It is evident, indeed, that enforcing the border is costly, and that it needs a technology including an immigration department, monitoring systems, jails, courts. Below, I specify the properties of the enforcement cost $c(\pi_S, \pi_U)$, defined over $\pi_S, \pi_U \in [0, 1]$, and twice continuously differentiable by assumption. Partial derivatives are denoted

[8] For simplicity I have used the same notation for both distributions $i(\theta)$ but, obviously, this does not mean that the distributions are the same.

with subscripts: $c_{\pi_S}(\pi_S, \pi_U)$ and $c_{\pi_U}(\pi_S, \pi_U)$ are, respectively, the marginal costs incurred to enforce π_S and π_U.

$$c_{\pi_S}(\pi_S, \pi_U) < 0 \textit{ and bounded for all } \pi_S \in [0,1] \tag{10}$$
$$c_{\pi_U}(\pi_S, \pi_U) < 0 \textit{ and bounded for all } \pi_U \in [0,1] \tag{11}$$
$$c(0,0) = c_0 > 0 \tag{12}$$
$$c(1,1) = 0 \tag{13}$$

Assumptions (10) and (11) mean that the cost is decreasing in π_S, π_U and that the marginal cost is finite. Condition (12) is simply the cost of a perfect frontier closure[9], and condition (13) says that no restriction implies zero cost. These assumptions are quite general and fit a wide class of functional forms.

For simplicity, this cost is financed via a flat tax on the capital income, therefore, labour income is not taxed[10]. Obviously, since unskilled workers do not own any capital, they pay no taxes. Let w_S^D and w_U^D define, respectively, the skilled and unskilled wage in D. The enforcement cost per unit of capital income is given by

$$\tau_K = \frac{c(\pi_S, \pi_U)}{KF_K}$$

where KF_K is the economy's total capital income.

The individual tax is therefore

$$T_j = c(\pi_S, \pi_U)\left[\frac{k_j}{K}\right] \tag{14}$$

To ensure that the after-tax labor and capital income are not negative for any j, I assume that the cost of perfect enforcement (c_0) satisfies

$$\left[F_K - \frac{c_0}{K}\right] \geq 0. \tag{15}$$

5 Immigration Policy and the Emigration Decision

From the point of view a potential migrant, π_S or π_U represents the probability of a successful migration. This method depicts intuitively the effect of entry rationing. The decision whether to migrate or not for an agent living in O is made by comparing the utilities within the alternative locations.

The model can be described in three steps: (1) natives choose a pair of immigration policies $\pi_S, \pi_U \in [0,1]$; (2) potential migrants choose whether or not to migrate; (3) the nature randomly chooses the fractions π_S, π_U of successful migrants.

[9] Notice that the model does not require an infinite cost of perfect enforcement.

[10] This tax is equivalent to a progressive tax on the total income with a no-tax threshold equal to the skilled wage.

Natives of O compare their utility in the two countries. Let w_{UD} be the skilled wage in D, and w_{UO} the unskilled wage in O. Since we are in a single-period model, consumption coincides with income. By using the linear utilities defined in (8), skilled workers try to migrate if $w_{SD} \geq \theta_U w_{SO}$, and unskilled workers do so if $w_{UD} \geq \theta_S w_{UO}$. As a consequence, we have to find a pair $(\hat{\theta}_S, \hat{\theta}_U)$ such that any agent denoted, respectively, by $\theta_S \leq \hat{\theta}_S$, $\theta_U \leq \hat{\theta}_U$ is willing to migrate.

Therefore, we are searching for the solutions to

$$\begin{cases} w_{SD} \geq \theta_S w_{SO} \\ w_{UD} \geq \theta_U w_{UO} \end{cases} \tag{16}$$

Condition (16) can be rewritten in terms of marginal productivities:

$$\begin{cases} F_S\left[(S_D + \pi_S I(\theta_S), (U_D + \pi_U I(\theta_U), K\right] \geq \theta_S G_S\left[(S_O - \pi_S I(\theta_S), (U_O - \pi_U I(\theta_U)\right] \\ \\ F_U\left[(S_D + \pi_S I(\theta_S)), (U_D + \pi_U I(\theta_U)), K\right] \geq \theta_U G_U\left[(S_O - \pi_S I(\theta_S)), (U_O - \pi_U I(\theta_U)\right] \end{cases} \tag{16'}$$

Each inequality means that emigration towards D continues until the utility of consuming in D is larger or equal to the utility of consuming in O. For a given policy (π_S, π_U), let $\tilde{\theta}_S\left(\tilde{\theta}_U\right)$ and $\tilde{\theta}_U\left(\tilde{\theta}_S\right)$ denote the marginal skilled and unskilled individuals who weakly prefer migrating to staying in O. Obviously, the complementarity of production factors implies that the quantity of unskilled workers affects the wage of a skilled worker and viceversa. This is the reason of the dependence between $\tilde{\theta}_S$ and $\tilde{\theta}_U$.

Now it is necessary to introduce a mild assumption: it is assumed that $\tilde{\theta}_S\left(\tilde{\theta}_U\right)$ and $\tilde{\theta}_U\left(\tilde{\theta}_S\right)$ are analytic[11]. This hypotesis will be quite useful to prove the following Lemma:

Lemma 1 *The system of inequalities (16') always admits at least a set of solutions given by* $\theta_S \leq \hat{\theta}_S(\pi_S, \pi_U)$, $\theta_U \leq \hat{\theta}_U(\pi_S, \pi_U)$. *Any pair* $(\hat{\theta}_S(\pi_S, \pi_U), \hat{\theta}_U(\pi_S, \pi_U))$ *is locally unique.*

Proof. See the Appendix. ■

The Proposition states that it is always possible to partition the population of O into potential migrants and stayers. In order to simplify the notation, in what follows I'm going to omit the arguments of $\hat{\theta}_S(\pi_S, \pi_U), \hat{\theta}_U(\pi_S, \pi_U)$ where this can be done unambigously.

The equilibrium real wages in the destination country are given by the left hand-side of (16) evaluated at $\hat{\theta}_S, \hat{\theta}_U$. Remark that in equilibrium the skilled wage cannot be lower than the unskilled wage. This happens since skilled wokers can accept unskilled jobs but not viceversa[12].

[11] The functions $\tilde{\theta}_S(\tilde{\theta}_U)$, $\tilde{\theta}_U(\hat{\theta}_S)$ are obtained by inverting the marginal productivities. Since the marginal productivities are analytic, the assumption means that analiticity is preserved after inverting the marginal productivities.

[12] If the marginal productivity of unskilled workers is higher, skilled ones will accept positions in the unskilled sector until the two productivities converge.

To characterize the behaviour of $\hat{\theta}_S, \hat{\theta}_U$ with respect to π_S and π_U we need a further assumption. In fact, when two production factors are moving from a country to another, complementarity makes it more difficult to predict what happens to the marginal productivities in both countries[13]. The proposed assumption states that, when two factors are entering (leaving) a country, the effect of complementarity never outweighs the direct effect on the marginal productivity. Since we are considering wages, this means that -as skilled and unskilled workers enter D- immigration cannot increase the wages. Thus, the effects due to complementarity are important, even though they are not sufficient to compensate the decreasing marginal productivity. This is consistent with the overwhelming empirical evidence that the negative effect of immigration on wages are surprisingly low (for a survey, see Gaston and Nelson 2000). In order to make the formulas less cumbersome, I'm going to use the notation F_S, F_U, F_K and G_S, G_U for the partial derivatives, and, again, I'm going to omit the arguments where this can be done unambiguously. Now it is possible to state formally the assumption:

$$\text{for a given } \left[\hat{\theta}_S, \hat{\theta}_U\right]$$

$$\begin{aligned} &\mid F_{SS} \mid > \mid F_{SU} \mid; \\ &\mid F_{UU} \mid > \mid F_{US} \mid; \\ &\mid G_{SS} \mid > \mid G_{SU} \mid; \\ &\mid G_{UU} \mid > \mid G_{US} \mid \end{aligned} \tag{17}$$

Under assumption (17) it is possible to characterize the behaviour of $\hat{\theta}_S, \hat{\theta}_U$ with respect to π_S, π_U:

Lemma 2 *In equilibrium, we have*

$$\frac{\partial \hat{\theta}_S}{\partial \pi_S} < 0; \quad \frac{\partial \hat{\theta}_S}{\partial \pi_U} > 0; \tag{18}$$

and

$$\frac{\partial \hat{\theta}_U}{\partial \pi_U} < 0; \quad \frac{\partial \hat{\theta}_U}{\partial \pi_S} > 0; \tag{19}$$

Proof. See the Appendix. The lemma can be easily proved by applying the Implicit Function Theorem. ■

As we are going to see in the next Lemma, $\hat{\theta}_S$ and $\hat{\theta}_U$ are decreasing in π_S and π_U because a higher border openness increases the number of successful migrations and thus reduces the wage differential.

Such a result is not as straightforward as it could appear: a larger $\pi_S(\pi_U)$ increases the probability of migrating, but also reduces the wage differential, and therefore the incentive to migrate.

[13] This problem is typically resolved in the literature by using different goods with different factor intensities, that allows to obtain a Stolper-Samuelson effect.

Lemma 3 *The number of successful immigrants is increasing in π_S, π_U, i.e.*

$$\frac{d\left[\pi_S I(\hat{\theta}_S)\right]}{d\pi_S} > 0 \quad ; \quad \frac{d\left[\pi_S I(\hat{\theta}_S)\right]}{d\pi_U} > 0 \tag{20}$$

$$\frac{d\left[\pi_U I(\hat{\theta}_U)\right]}{d\pi_U} > 0 \quad ; \quad \frac{d\left[\pi_U I(\hat{\theta}_U)\right]}{d\pi_S} > 0 \tag{21}$$

Proof. See the Appendix. ■

The previous Lemma and the complementarity of production factors allow us to write the following Corollary:

Corollary 4 *since the number of successful immigrants -skilled and unskilled- is increasing with π_S and π_U, we have $\frac{\partial F_S}{\partial \pi_U} > 0$, $\frac{\partial F_U}{\partial \pi_S} > 0$, $\frac{\partial F_K}{\partial \pi_S} > 0$, $\frac{\partial F_K}{\partial \pi_U} > 0$. Moreover, since enforcement costs are decreasing in π_S and π_U,the skilled (unskilled) wage is always increasing with respect to π_U (π_S).*

Remark, finally, that the individual share of enforcement cost decreases as π_S or π_U increase.

6 Voting Over Immigration Policy

As I argued in the Introduction, an overwhelming literature proves that non-economic factors matter in decisions over immigration. In spite of its importance, this point has not been developed in formal models of voting. The present model takes into account this cultural factor in the simplest way: it is assumed that the stock of unskilled immigrants enters negatively the utility. Skilled immigration, on the other hand, has smaller figures and creates less concerns. Therefore, it is possible to write the utility of natives as depending on their net income, minus the stock of immigrants.

$$Q_S = F_S + F_K k_j - \left[c(\pi_S, \pi_U)\frac{k_j}{K} + \pi_U I(\hat{\theta}_U)\right] \tag{22}$$

$$Q_U = F_U - \pi_U I(\hat{\theta}_U) \tag{23}$$

Q_S and Q_U are, respectively, the utility of a skilled and of an unskilled native. F_S is the skilled wage, and $F_K k_j$ is the capital income. $c(\pi_S, \pi_U)\frac{k_j}{K}$ is the tax necessary to enforce the entry barriers, and it is paid only by skilled workers. Obviously, F_U is the unskilled wage. Only natives are granted voting rights, and they choose the values of $[\pi_S, \pi_U]$ that maximize their utility. For the final results it is quite important to remark that utility in (22), describes single-crossing preferences, as it is stated in the following Lemma:

Lemma 5 *The preferences described by (22) are single-crossing.*

Proof. see the Appendix. ■

The single-crossing property will be quite useful in determining the voting behaviour of skilled voters in the next Section.

6.1 Pairwise alternatives: the Shepsle procedure

I want now to investigate the existence of an immigration policy able to defeat any other policy in a pairwise contest under majority voting. I'm going to adopt the Shepsle procedure as the solution concept for this bidimensional voting problem.

The following analysis holds around any solution of (16'). For simplicity, the main result is stated at the outset:

Proposition 6 *In a Shepsle voting procedure over* (π_S, π_U) *, the Condorcet winning immigration policy is the pair* (π_S^*, π_U^*) *chosen by the median voter when the majority is skilled. An unskilled majority,on the other hand, decide by unanimity.*

Proof. See the Appendix. ■

This result is quite intuitive since preferences are single-crossing along each dimension of the problem for skilled workers. Unskilled workers, instead, are unanimous because they are homogeneous. Now it is useful to characterize some properties of the pair (π_S^*, π_U^*) chosen by the median (skilled) voter.

6.1.1 Skilled natives: decision over skilled immigration

Even though no closed-form solutions are available, it is possible to have some information on the decision of the voters: consider first the choice of π_S. As it is showed in the Appendix, it is possible to see when voters prefer a corner solution or an interior solution. This depends, of course, on the individual capital endowment. By analysing the utility when $\pi_S \to 0$ and when $\pi_S \to 1$, respecively, it is possible to introduce the following Proposition[14]:

Proposition 7 *(Optimal* π_S *for skilled natives): let us define the capital en-*

[14] In order to make the expression more readable, with a slight abuse of notation, in the definitions of $Z_S(0), Z_S(1), V_S(0), V_S(1)$, the symbol of the limit is omitted. I have written always $\frac{\partial \hat{\theta}_S}{\partial \pi_S}$ instead of $\lim_{\pi_S \to 0} \frac{\partial \hat{\theta}_S}{\partial \pi_S}$, $\lim_{\pi_S \to 1} \frac{\partial \hat{\theta}_S}{\partial \pi_S}$, $\lim_{\pi_U \to 0} \frac{\partial \hat{\theta}_S}{\partial \pi_U}$, $\lim_{\pi_U \to 1} \frac{\partial \hat{\theta}_S}{\partial \pi_U}$. The same is true for $\frac{\partial \hat{\theta}_U}{\partial \pi_U}$, $\frac{\partial \hat{\theta}_U}{\partial \pi_U}$ and for all derivatives, indicated, for example, with F_{SS} instead of $\lim_{\pi_S \to 0} F_{SS}$.

dowments[15] $Z(0),\ Z(1):$

$$Z(0) \equiv \frac{D(0)(1-F_{SS})}{F_{KS}D(0)+\pi_U F_{KU} i(\hat{\theta}_U(0,\pi_U))\frac{\partial \hat{\theta}_U}{\partial \pi_S}-\frac{c_{\pi_S}(0,\pi_U)}{K}}$$

$$Z(1) \equiv \frac{D(1)(1-F_{SS})-\pi_U F_{SU} i\left(\hat{\theta}_U(1,\pi_U)\right)\frac{\partial \hat{\theta}_U}{\partial \pi_S}}{F_{KS}D(1)+\pi_U F_{KU} i(\hat{\theta}_U(1,\pi_U))\frac{\partial \hat{\theta}_U}{\partial \pi_S}-\frac{c_{\pi_S}(1,\pi_U)}{K}}$$

then,

$$\begin{array}{llll} & (a) \quad \textit{(Interior maximum)} & & \\ \textit{if} & Z(1) > Z(0) \quad \textit{then} & & \\ & \pi_S^* = 0 & \textit{for} & k_j \leq Z(0), \\ & \pi_S^* \in (0,1) & \textit{for} & k_j \in (Z(0), Z(1)], \ \textit{and} \\ & \pi_S^* = 1 & \textit{for} & k_j > Z(1) \end{array}$$

[16]

$$\begin{array}{llll} & (b) \quad \textit{(Corner maximum)} & & \\ \textit{if} & Z(0) \geq Z(1), \quad \textit{then} & & \\ & \pi_S^* = 0 & \textit{for} & k_j \leq Z(1), \quad \textit{and} \\ & \pi_S^* = 1 & \textit{for} & k_j > Z(0) \quad \textit{(polarization)} \end{array}$$

Proof. *See the Appendix.* ■

This Proposition specifies when skilled voters will prefer interior solutions or corner solutions with respect to the entry of the competing factor. As I will argue later, case (a) describes best the policies adopted by developed countries, where skilled immigration is not forbidden, but far from being open. In case (b) we can see that the population of skilled voters is polarized between those preferring open immigration and those preferring no immigration at all. This situation can be interpreted as a particular case of (a). Notice that if $Z(1) < 0$ we have $\pi_S^* = 1$ by unanimity.

6.1.2 Skilled natives: decision over unskilled immigration

By repeating the reasoning used in the previous Section, we can partition the natives with respect to their choice over unskilled immigration. It is useful recalling that the skilled wage is always increasing as unskilled workers enter D, thus any $\pi_U^* \neq 1$ is due to non-economic concerns.

[15] In the definitions of $Z(0), Z(1)$ we have $D(0) \equiv \lim_{\pi_S \to 0} \frac{\partial \pi_U I(\hat{\theta}_U)}{\partial \pi_S} = I(\hat{\theta}_S(0,\pi_U)) > 0$, and $D(1) \equiv \lim_{\pi_S \to 1} \frac{\partial \pi_U I(\hat{\theta}_U)}{\partial \pi_S} = I(\hat{\theta}_S(1,\pi_U)) + i(\hat{\theta}_S(1,\pi_U)) \lim_{\pi_S \to 1} \frac{\partial \hat{\theta}_S}{\partial \pi_S} > 0.$

Proposition 8 *(optimal π_U for skilled workers): let us define the capital endowments*[17] *$V_S(0)$, $V_S(1)$ as follows:*

$$V(0) \equiv \frac{E(0)(1-F_{SU})}{F_{KU}E(0) + \pi_S F_{KS} i(\hat{\theta}_S(\pi_S,0)\frac{\partial \hat{\theta}_S}{\partial \pi_U} - \frac{c_{\pi_U}(\pi_S,0)}{K}};$$

$$V(1) = \frac{E(1)(1-F_{SU}) - \pi_S F_{SS} i(\hat{\theta}_S(\pi_S,1))\frac{\partial \hat{\theta}_S}{\partial \pi_U}}{F_{KU}E(1) + \pi_S F_{KS} i(\hat{\theta}_S(\pi_S,1))\frac{\partial \hat{\theta}_S}{\partial \pi_U} - \frac{c_{\pi_U}(\pi_S,1)}{K}};$$

then,

$$\begin{array}{llll} & (a') & \textit{(Interior maximum)} & \\ \textit{if} & V(1) > V(0), & \textit{then} & \\ & \pi_{iU}^* = 0 & \textit{for} & k_j \leq V(0), \\ & \pi_{iU}^* \in (0,1) & \textit{for} & k_j \in (V(0), V(1)], \ \textit{and} \\ & \pi_{iU}^* = 1 & \textit{for} & k_j > V(1) \end{array}$$ [18]

$$\begin{array}{llll} & (b') & \textit{(Corner maximum)} & \\ \textit{if} & V(1) < V(0) & & \\ & \pi_{iU}^* = 0 & \textit{for} & k_j \leq V(0), \quad \textit{and} \\ & \pi_{iU}^* = 1 & \textit{for} & k_j > V(0) \end{array}$$

The above proposition, as the previous one, specifies the intervals of capital endowments that cause interior solutions or corner solutions. In particular, when at least one of $V(0), V(1)$ is negative, the maxima always lie on a corner. Obviously, the Condorcet winner depends on where the median voter's capital endowment lies. We see that, depending on the relative magnitudes of $V(0), V(1), Z(0), Z(1)$, it is possible to obtain any combination of interior and corner solutions for skilled and unskilled immigration. When we look at the main immigration policies (briefly surveyed in the next Section) we see that corner solutions never emerge: entry is restricted for both skilled and unskilled immigrants, though the former are subject to less restrictions. On the other hand, open immigration is not allowed. Therefore, we can conclude that, as one can expect, the observed policies mirror an interior solution along both the dimensions, i.e. $(\pi_S, \pi_U \in (0,1))$. This result is summarized in case *(a)* in Proposition 7 and case *(a')* in Proposition 8.

[17] In the definitions of $V_S(0), V_S(1)$ we have $E(0) \equiv \lim_{\pi_U \to 0} \frac{\partial \pi_U I(\hat{\theta}_U)}{\partial \pi_U} = I(\hat{\theta}_U(\pi_S,0)) > 0$, and $E(1) \equiv \lim_{\pi_U \to 1} \frac{\partial \pi_U I(\hat{\theta}_U)}{\partial \pi_U} = I(\hat{\theta}_U(\pi_S,1)) + i(\hat{\theta}_U(\pi_S,1)) \lim_{\pi_U \to 1} \frac{\partial \hat{\theta}_U}{\partial \pi_U} > 0$.

6.1.3 Unskilled natives

The solution for the unskilled workers problem is easier than the one for skilled workers, and it is summarized in the following Proposition:

Proposition 9 *(Optimal choice for unskilled natives): since there is no heterogeneity, unskilled workers vote by unanimity: with respect to unskilled immigration, they choose* $\pi_U^* = 0$*. With respect to skilled immigration, the final decision depends on the relative importance of the factor complementarity and of the immigration aversion.*

Proof. See the Appendix. ■

The result with respect to π_U is intuitive, because unskilled workers can switch the cost of border enforcement towards skilled workers, thus they can enjoy protection at no cost.

When voting over skilled immigration, the entry of a complementary factor raises the unskilled wage but also the inflow of unskilled workers (see (21)). This reduces -and, in principle, it might reverse- the benefits stemming due to skilled immigration. Even if we can hypothesize that this is a second-order effect, its importance cannot be neglected *a priori*. Therefore, we can only conjecture that $\pi_S^* = 1$ is a likely outcome. However, in developed countries unskilled voters are the minority, and the final decision pertains to skilled natives. Unskilled majorities are more likely to form in developing countries, were selective policies are not used. As a consequence, this result has not empirical relevance.

An interesting characteristic of the voting outcomes of is that immigration aversion might overcome the economic benefits of immigration. It would be important to evaluate empirically the relative importance of this factor.

7 Current immigration policies

The case of an unskilled majority is not important for the policies adopted by developed countries. On the other hand, developing countries, which also restrict entry for immigrants, do not use selective policies. As a consequence, in what follows, the attention is focused on the main requirements to enter the most important areas of immigration. As we are going to see, the access of skilled workers is subject to several restrictions, and it is far from being open.

For example, Canada requires an Employment Authorization (i.e. a job offer), which entitles to a temporary residence permit. The EA is not required for certain activities considered "beneficial to Canada", which include some highly-skilled jobs and business operators. More requirements have to be met to get a permanent residence permit: job-searching immigrants are screened according to a point system, and business immigrants are selected upon their abilities "to make a contribution to the Canada's economy". The score to get an immigrant visa is 67 points.

Entry to Australia is heavily regulated: applicants take a point test for many visa classes. The main requirements to get a skilled immigration visa are: being under 45, being fluent in English, matching the Australian Skilled Occupation List, having more than a post-secondary education, and having the Australian Assessing Authorithy approve the application.

Another remarkable example is the US "green card" lottery program, which grants a permanent residence permit to 55000 skilled immigrants randomly chosen from the pool of applicants. Regulations for entering the US are quite complicated: different visas are granted on the basis of individual characteristics[19].

For a comprehensive survey of the European policies, I refer to Boeri and Bruckner (2005). For the purposes of this paper, I'm going to mention only some of the most evident entry restrictions for skilled workers. The UK issues different immigration, naturalization and working visas. Again, a point system is used to screen the most qualified immigrants, who are allowed open entry if they score at least 65 points[20]. Since 2002, a Sectors Based Scheme (SBS) is used for unskilled workers: they must be between 18 and 30 and have a job offer from a list of sectors where the local labour supply is scarce (this scheme covers basically the Hospitality, Catering and Food Manufacturing Industry). An immigrant entering under the SBS is allowed to work for 12 months, and must leave the UK for at least 2 months before applyng again. Moreover, he/she can bring no dependents into the country.

Since 2000, Germany is implementing special programs ("green cards") for highly-skilled immigrants in the IT sector. Currently, the new immigration law is under discussion at the Bundestag. It should include a point system granting permanent residence even without a job offer and the mandatory attendance to German courses.

Of course, the admission threshold can be changed according to economic and political needs (it has recently been lowered in the UK and Canada).

Far from being a proof that skilled immigration is "welcome", such selection is nothing but a rationing mechanism.

Skilled immigration rationing is evident in the closed-door policies for central and eastern european (CEE) entrants to EUon may 1st, 2004. These countries are endowed with a large supply of well-educated workers, whose mobility within the EU has been restricted, initially, for two years. The national governments are deciding whether to extend the rationing for a further five years[21]. Boeri and Bruckner (2005) classify four regimes that regulate entries for nationals of the new entrants: the first one simply considers them still as non EU countries; the second regime opens the labour market only to a quota of new entrants; the third requires that some conditions regarding wages, working conditions etc. are met. Finally, entry was free only in Sweden and Ireland, that applied the

[19] Entry to the U.S. is regulated via a complicated system of visas depending on the skills of the applicants and their sector of activity. They are issued in a pre-determined amount each year.

[20] Points are scored in the following five main areas: educational qualifications, work experience, past earnings, achievements in the applicant's chosen profession, and the skills and achievements of the applicant's partner.

[21] Such a "transition period" was indeed part of the agreement that enabled the entry into the community of Greece, Portugal and Spain as well.

rules of the Community for the free movement of labour[22]. In the last months, Italy -which does not adopt yet any selective policy- has decided as well to open the borders to Romanian and Bulgarian citizens. In Table 1 I report some education statistics for CEE countries (Source: Summary Education Profile, the World Bank)[23].

	Compulsory schooling (y)	Gross enrollment ratio (tertiary level)	School life (y)	Repetition rate
Czech Rep.	10	33.7	14.7	0.7
Estonia	9	63.9	15.6	2.0
Hungary	10	44.1	15.3	0.3
Latvia	9	68.5	14.9	1.7
Lithuania	9	64.5	15.4	0.6
Poland	9	59.5	15.1	0.3
Slovakia	10	32.1	13.7	2.5
Slovenia	7	66	15.9	1.4

In Table 2 the same indicators for the main countries of the Euro area are reported.

	Compulsory schooling (y)	Gross enrollment ratio (tertiary level)	School life (y)	Repetition rate
Austria	9	48.3	14.8	2.2
Belgium	13	59.8	18.9	3.2
Finland	10	85.7	18.1	1
France	11	53.6	15.4	8.1
Germany	13	48.4	16	2.1
Greece	9	68.3	14.9	3.4
Ireland	10	49.9	16.7	2.2
Italy	9	53.1	15.4	2.6
Netherlands	13	57	16.5	4.6
Portugal	9	50	16.1	2
Spain	11	56.8	16	9.4

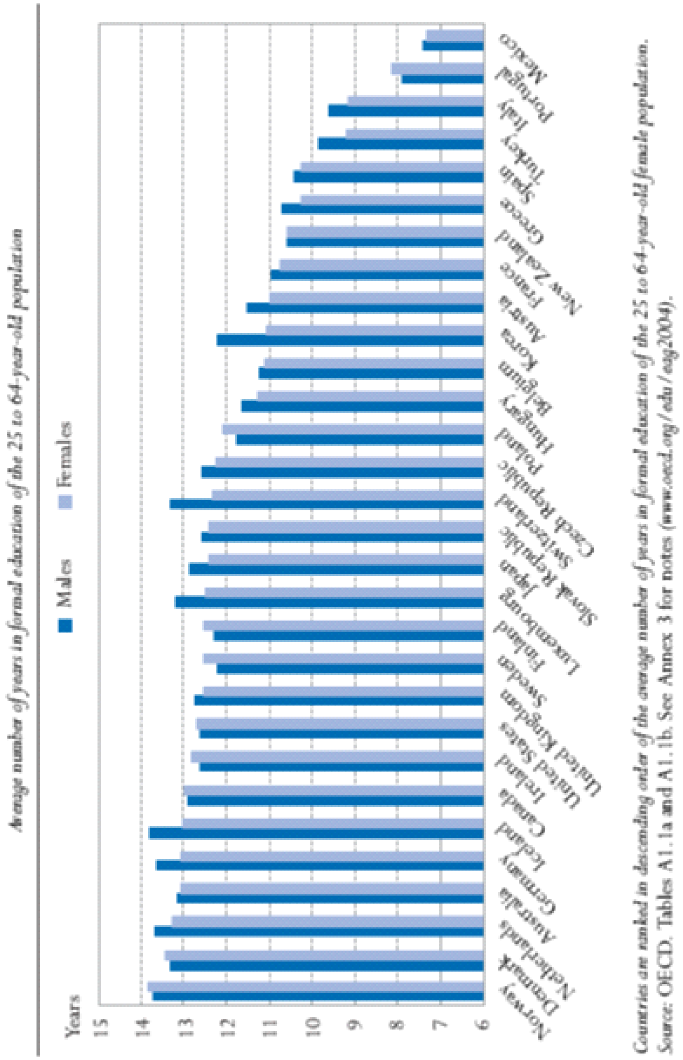
We see that educational attainments are quite comparable, therefore eastern european workers may a good substitute for skilled natives.

Looking at the educational attainment of the adult population, this evidence is even clearer. The figure on the next page, taken from OECD (2004), shows the educational attainment of the 25-64 year-old population in OECD countries.

[22] The first regime was adopted by Belgium, Finland, Germany, Greece, France, Luxembourg and Spain. The second one was used in Austria, Netherlands, Italy, Portugal, and the third one in Denmark, Ireland and the U.K.

[23] The indicators used are: years of compulsory schooling, gross enrollment ratio to tertiary level educuation, school life expectancy and repetition rate at the secondary level school. The latter is useful since school life expectancy includes years spent in repetition. The gross enrollment ratio is the sum of all tertiary level students enrolled at the start of the scholl year, expressed as a percentage of the mid-year population in the 5 year age group after the official secondary school leaving age. Generally, data refer to 2002, even though in some cases -notably the repetition rates- they can be quite older. For example, Spain's repetition rate refers to 1995.

From this point of view, It is not difficult to explain "why European are so tough on Eastern-European migrants". However, the interpretation proposed in this paper is not necessarily alternative to that in Boeri and Bruckner (2005), who argue that the tightening of immigration restriction can be due to a lack of co-ordination among EU members.



Educational Attainment (2002)

8 Conclusions

In this paper I developed a model of voting over selective immigration policies within a three-factor, two-country model. I have paid particular attention to include skilled and unskilled voters, and to consider the aversion to immigration, whose importance is neglected in the literature in spite of its huge empirical evidence. This aversion has been useful to explain why entry for unskilled workers is restricted in skilled, well educated societies. From this point of view, entry rationing for unskilled workers is more difficult to explain than entry rationing for skilled immigrants. Moreover, the role played by the cost of financing immigration restrictions is crucial to understand why it is so difficult to observe a perfect border closure, and why a positive inflow of immigrants is always allowed.

Unlike the generalized claim that qualified immigration is "welcome", my model obtains a selective immigration policy as a form of protectionism. Indeed, freedom of entry is usually granted to *highly skilled* individuals in *specific sectors* of the economy where they do not compete with the median voter.

As mentioned above, the German Green Card scheme introduced in August 2000 was aimed at recruiting IT specialists to respond to a predicted national shortage. The UK Highly Skilled Migrant Programme started in 2002 opened the door to highly skilled individuals who had the skills and experience *required by the UK*.

Such limited inflows appear carefully designed in order to protect the national median voters. In the model presented, the case of a skilled majority with interior solutions yields a satisfactory representation of the current immigration policies.

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Appendix

Proof of Lemma 1
Existence:
I report here the system of inequalities in (16'):

$$\begin{cases} F_S\left[(S_D+\pi_S I(\theta_S)),(U_D+\pi_U I(\theta_U)),K\right] \geq \theta_S G_S\left[(S_O-\pi_S I(\theta_S)),(U_O-\pi_U I(\theta_U))\right] \\ \qquad (\gamma)\ \text{-skilled} \\ F_U\left[(S_D+\pi_S I(\theta_S)),(U_D+\pi_U I(\theta_U))\right],K \geq \theta_U G_U\left[(S_O-\pi_S I(\theta_S)),(U_O-\pi_U I(\theta_U))\ \right] \\ \qquad (\sigma)\ \text{-unskilled} \end{cases}$$

By assumption, the marginal productivities are continuous and differentiable in all their arguments. The LHS of each inequality is the utility of consuming abroad, while the RHS is the utility of consuming at home. Suppose there is a solution $\tilde{\theta}_U$ to ineq. (σ), and consider ineq. (γ). For having an interior solution, we want that, for any $\tilde{\theta}_U$, there exist $\tilde{\theta}_S(\tilde{\theta}_U)$ such that the LHS of (γ) equals the RHS. If an interior solution does not exist, either $F_S < \theta_S G_S$ for any θ_S or viceversa. In the first case, there is no incentive to migrate for all (skilled) agents. This case has not economic interest, and we can rule it out without loss of generality. On the other hand, when $\theta_S G_S < F_S$ for any θ_S, there exist an incetive to migrate for all (skilled) workers. Hence, the problem is reduced to analyse only the solutions to eq. (σ). Apart this trivial case, since $\frac{\partial F_S}{\partial \theta_S} < 0$ and $\frac{\partial G_S}{\partial \theta_S} > 0$, continuity is sufficient to get a unique solution $\tilde{\theta}_S(\tilde{\theta}_U)$[24].

The same argument can be used to prove that, in eq. (σ), there exist $\tilde{\theta}_U(\tilde{\theta}_S)$ for any $\tilde{\theta}_S$ (apart the trivial case). In the following table, I report the set of possible solutions to (16'):

	Corner Solution $F_U > \theta_U G_U$	Interior Solution $F_U = \theta_U G_U$
Corner Solution $F_S > \theta_S G_S$	$\hat{\theta}_U = \bar{\theta}_U \forall \tilde{\theta}_S$ $\hat{\theta}_S = \bar{\theta}_S \forall \tilde{\theta}_U$	$\hat{\theta}_U \in \left(\underline{\theta}_U, \bar{\theta}_U\right)$ $\hat{\theta}_S = \bar{\theta}_S \forall \tilde{\theta}_U$
Interior Solution $F_S = \theta_S G_S$	$\hat{\theta}_U = \bar{\theta}_U \forall \tilde{\theta}_S$ $\hat{\theta}_S \in \left(\underline{\theta}_S, \bar{\theta}_S\right)$	$\hat{\theta}_U \in \left(\underline{\theta}_U, \bar{\theta}_U\right)$ $\hat{\theta}_S \in \left(\underline{\theta}_S, \bar{\theta}_S\right)$

Now, I have to prove that, given $\tilde{\theta}_S(\tilde{\theta}_U)$ and $\tilde{\theta}_U(\tilde{\theta}_S)$, it is possible to find $\hat{\theta}_U$ and $\hat{\theta}_S$ such that $\tilde{\theta}_U(\hat{\theta}_S) = \hat{\theta}_U$, and $\tilde{\theta}_S(\hat{\theta}_U) = \hat{\theta}_S$.

[24] Remark that $\tilde{\theta}_S(\tilde{\theta}_U)$ is obtained by inverting $(F_S - \theta_S G_S = 0)$ that is a continuous, bijective function. As a consequence, $\tilde{\theta}_S(\tilde{\theta}_U)$ is continuous as well.

This is true when the function $\Phi(\tilde{\theta}_U) = \tilde{\theta}_U(\tilde{\theta}_S(\tilde{\theta}_U))$ has a fixed point. Since the sets $[\underline{\theta}_S, \bar{\theta}_S], [\underline{\theta}_U, \bar{\theta}_U]$ are convex and compact, and since $\Phi(\tilde{\theta}_U)$ maps $[\underline{\theta}_U, \bar{\theta}_U]$ continuously into itself, it is easy to prove the existence by applying the Brouwer's fixed point theorem.

Local Uniqueness

In order for the solution $(\hat{\theta}_U, \hat{\theta}_S)$ to be locally unique, we need that it does not exist an interval where the functions $\tilde{\theta}_S(\tilde{\theta}_U)$ and $\tilde{\theta}_U(\tilde{\theta}_S)$ are overlapped. Since both $\tilde{\theta}_S(\tilde{\theta}_U)$ and $\tilde{\theta}_U(\tilde{\theta}_S)$ are analytic by assumption, this holds for any $\tilde{\theta}_S(\tilde{\theta}_U) \neq \tilde{\theta}_U(\tilde{\theta}_S)$.

Proof of Lemma 2

Lemma 2 can easily be proved by applying the Implicit Function Theorem and the assumption (17) to the equations in (16'). In order to obtain simpler expressions, I'm going to define the following terms:

$$C(U) \equiv \pi_U i(\hat{\theta}_U)(F_{UU} + \hat{\theta}_U G_{UU}) - G_U < 0 \tag{24}$$

$$C(S) \equiv \pi_S i(\hat{\theta}_S)(F_{SS} + \hat{\theta}_S G_{SS}) - G_S < 0 \tag{25}$$

$$A \equiv \pi_U i(\hat{\theta}_U)(F_{UU} + \hat{\theta}_U G_{UU})(F_{SS} + \hat{\theta}_S G_{SS}) -$$

$$-\pi_U i(\hat{\theta}_U)(F_{SU} + \hat{\theta}_U G_{SU})(F_{US} + \hat{\theta}_U G_{US}) - G_U(F_{SS} + \hat{\theta}_S G_{SS}) > 0; \tag{26}$$

$$B \equiv \pi_S i(\hat{\theta}_S)(F_{SS} + \hat{\theta}_S G_{SS})(F_{UU} + \hat{\theta}_U G_{UU}) -$$

$$-\pi_S i(\hat{\theta}_S)(F_{SU} + \hat{\theta}_S G_{SU})(F_{US} + \hat{\theta}_U G_{US}) - G_S(F_{UU} + \hat{\theta}_U G_{UU}) > 0 \tag{27}$$

The derivatives in (18) are, respectively,

$$\frac{d\hat{\theta}_S}{d\pi_S} = \frac{-AI(\hat{\theta}_S)}{\pi_S i(\hat{\theta}_S)A - G_S C(U)} < 0 \tag{28}$$

and

$$\frac{d\hat{\theta}_S}{d\pi_U} = \frac{G_U(F_{SU} + \hat{\theta}_S G_{SU})I(\hat{\theta}_U)}{\pi_U i(\hat{\theta}_U)B - C(S)G_U} > 0; \tag{29}$$

the derivatives in (19) are, respectively,

$$\frac{d\hat{\theta}_U}{d\pi_U} = \frac{-BI(\hat{\theta}_U)}{\pi_U i(\hat{\theta}_U)B - G_U C(S)} < 0 \tag{30}$$

and

$$\frac{d\hat{\theta}_U}{d\pi_S} = \frac{G_S(F_{US} + \hat{\theta}_U G_{US})I(\hat{\theta}_S)}{\pi_S i(\hat{\theta}_S)A - C(U)G_S}. \tag{31}$$

Proof of Lemma 3

The number of successful immigrants is increasing with respect to the border openness: for skilled workers we have

$$\frac{d(\pi_S I(\hat{\theta}_S))}{d\pi_S} = \frac{-G_S C(U) I(\hat{\theta}_S)}{A\pi_S i(\hat{\theta}_S) - G_S C(U)} > 0 \tag{32}$$

$$\frac{d(\pi_S I(\hat{\theta}_S)}{d\pi_U} = \pi_S i(\hat{\theta}_S)\frac{d\hat{\theta}_S}{d\pi_U} > 0 \tag{33}$$

and for the unskilled

$$\frac{d(\pi_U I(\hat{\theta}_U))}{d\pi_S} = \pi_U i(\hat{\theta}_U)\frac{d\hat{\theta}_S}{d\pi_U} > 0 \tag{34}$$

$$\frac{d(\pi_U I(\hat{\theta}_U))}{d\pi_U} = \frac{-G_U C(S) I(\hat{\theta}_U)}{B\pi_U i(\hat{\theta}_U) - G_U C(S)} > 0 \tag{35}$$

Proof of Lemma 5

It is necessary to check if the preferences of skilled workers are single-crossing along each of the dimensions of the problem (π_S, π_U). It can be done by applying the definition and recalling assumption (17): preferences exhibit the single-crossing property with respect to π_S if we can order the voters from left to right with respect to their capital endowment and, given $\pi_S' > \pi_S$ and $k' > k$, we have:

$$\begin{array}{llllll} if & u(k', \pi_S) \geq u(k', \pi_S') & (a) & then & u(k_1, \pi_S) \geq u(k_1, \pi_S') & (a\prime) \\ & and & & & & \\ if & u(k, \pi_S') \geq u(k, \pi_S) & (b) & then & u(k', \pi_S') \geq u(k', \pi_S) & (b\prime) \end{array}$$

when (a) is true we can write

$$F_S[\pi_S] - F_S[\pi_S'] + \pi_U I(\hat{\theta}_U(\pi_S', \pi_U)) - \pi_U I(\hat{\theta}_U(\pi_S, \pi_U)) \geq$$
$$\geq k'\left[\frac{c(\pi_S, \pi_U)}{K} - \frac{c(\pi_S', \pi_U)}{K} + F_K[\pi_S'] - F_K[\pi_S]\right] \tag{36}$$

when (a) is true, it clearly implies (a') because $k < k'$. Condition (b) can be written as

$$F_S[\pi_S] - F_S[\pi_S'] + \pi_U I(\hat{\theta}_U(\pi_S', \pi_U)) - \pi_U I(\hat{\theta}_U(\pi_S, \pi_U)) \leq$$
$$k'\left[\frac{c(\pi_S, \pi_U)}{K} - \frac{c(\pi_S', \pi_U)}{K} + F_K[\pi_S'] - F_K[\pi_S]\right] \tag{37}$$

and it clearly implies (b') since $k < k'$

Proof of Proposition 6

In order to apply the Shepsle procedure, each voter finds the value of π_S that maximizes her utility for a given π_U and viceversa. This produces two "reaction functions" $\pi_S^*(\pi_U)$ and $\pi_U^*(\pi_S)$. These functions clearly exist because (22) and (23) are continuous functions defined over a compact domain, and we can apply the Weierstrass theorem. $\pi_S^*(\pi_U)$ and $\pi_U^*(\pi_S)$ are implicit functions. Consider now the function $\Omega = \pi_S^*(\pi_U) - \pi_U^*(\pi_S)$. If it displays a fixed point, then an equilibrium exists. Since Ω is continuous, in order to apply the Brouwer's fixed point theorem we only need that the *absolute* maxima $\pi_S^*(\pi_U)$ and $\pi_U^*(\pi_S)$ are unique; otherwise the domain of Ω would not be convex. Thus, as it usually happens in the literature, the results are restricted to the case in which $\pi_S^*(\pi_U)$ and $\pi_U^*(\pi_S)$ are unique or, alternatively, we can rule out the possibility that $\pi_S^*(\pi_U)$ and $\pi_U^*(\pi_S)$ are not unique.

Proof of Proposition 7

Consider the derivative of (22) with respect to π_S:

$$\frac{\partial Q_S}{\partial \pi_S} = F_{SS}\left(I(\hat{\theta}_S) + \pi_S i(\hat{\theta}_S)\frac{\partial \hat{\theta}_S}{\partial \pi_S}\right) + \pi_U F_{SU} i(\hat{\theta}_U)\frac{\partial \hat{\theta}_U}{\partial \pi_S} + \tag{38}$$
$$+ k_j\left[F_{KS}\left(I(\hat{\theta}_S) + \pi_S i(\hat{\theta}_S)\frac{\partial \hat{\theta}_S}{\partial \pi_S}\right) + \pi_U F_{KU} i(\hat{\theta}_U)\frac{\partial \hat{\theta}_U}{\partial \pi_S} - \frac{c_{\pi_S}(\pi_S, \pi_U)}{K}\right] - \pi_U i(\hat{\theta}_U)\frac{\partial \hat{\theta}_U}{\partial \pi_S}$$

To find the intervals $Z(0), Z(1)$ it is necessary to find the capital endowments such that the derivative (38) is increasing when $\pi_S \to 0$ and decreasing when $\pi_S \to 1$. For $Z(0)$ it is sufficient computing $\lim\limits_{\pi_S \to 0} \frac{\partial Q_S}{\partial \pi_S}$, then setting $\lim\limits_{\pi_S \to 0} \frac{\partial Q_S}{\partial \pi_S} > 0$ and solving for k_J. For $Z(1)$, I compute $\lim\limits_{\pi_S \to 1} \frac{\partial Q_S}{\partial \pi_S}$, I set $\lim\limits_{\pi_S \to 0} \frac{\partial Q_S}{\partial \pi_S} < 0$ and I solve again for k_J. It is useful to remark that the limit of expression (38) is finite in both cases.

Interestingly, by examining (38), we immediately see that for $k_j \to \infty$ expression (38) is strictly positive for any π_S. As a consequence, for k_j sufficiently high the optimal choice will be $\pi_S^* = 1$. We assume that $\bar{k}$ is high enough to ensure that there will exist some individuals who choose such a solution.

Proof of Proposition 8:

Consider now the derivative of (22) with respect to π_U:

$$\frac{\partial Q_S}{\partial \pi_U} = \pi_S F_{SS} i(\hat{\theta}_S)\frac{\partial \hat{\theta}_S}{\partial \pi_U} + F_{SU}\left(I(\hat{\theta}_U) + \pi_U i(\hat{\theta}_U)\frac{\partial \hat{\theta}_U}{\partial \pi_U}\right) - \left(I(\hat{\theta}_U) + \pi_U i(\hat{\theta}_U)\frac{\partial \hat{\theta}_U}{\partial \pi_U}\right) +$$
$$+ k_i\left(\pi_S F_{KS} i(\hat{\theta}_S)\frac{\partial \hat{\theta}_S}{\partial \pi_U} + F_{KU}\left(I(\hat{\theta}_U + \pi_U i(\hat{\theta}_U)\frac{\partial \hat{\theta}_U}{\partial \pi_U}\right) - \frac{c_{\pi_S}(\pi_S, \pi_U)}{K}\right) \tag{39}$$

By taking the limit of (39) for $\pi_U \to 0$ and $\pi_U \to 1$ it is possible to find $V(0)$ and $V(1)$ as it has been done for $Z(0), Z(1)$. It is important to remark that $Z(1)$

and $V(1)$ can be negative. In such a case, the utility is never decreasing as π_S and π_U approach the unity, and we have polarization on corner solutions.

Proof of Proposition 9

Consider the utility defined by (23). In order to apply the Shepsle procedure, we have to find a π_S that maximizes the utility for a given π_U. Again, let this value be $\pi_S^*(\pi_U)$. By the Weierstrass theorem, we know that $\pi_S^*(\pi_U)$ exists. Since there is no heterogeneity, it is chosen by unanimity. Consider now the derivative of (23) with respect to π_U : we have

$$\frac{\partial Q_U}{\partial \pi_U} = \pi_S F_{SS} i(\hat{\theta}_S) \frac{\partial \hat{\theta}_S}{\partial \pi_U} + \left(I(\hat{\theta}_U) + \pi_U i(\hat{\theta}_U) \frac{\partial \hat{\theta}_U}{\pi_U} \right) (F_{UU} - 1) < 0 \qquad (40)$$

this derivative is always negative, thus, when voting over unskilled immigration, $\pi_U^*(\pi_S) = 0$ (again by unanimity). Therefore, to get an equilibrium of the Shepsle procedure is easier than for Prop. 6, and it is reduced to the pair $[\pi_S^*(0), 0]$.