Prejudice and Immigration*

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Abstract

We study immigration policy in a small open receiving economy under self-selection of migrants. We show that immigration policy choice affects and is affected by the migratory decisions of skilled and unskilled foreign workers. From this interaction multiple equilibria may arise, which are driven by the policy maker's expectation on the migrants' size and skill composition (and, hence, on the welfare effects of immigration). In particular, pessimistic (optimistic) beliefs induce a country to impose higher (lower) barriers to immigration, which crowd out (crowd in) skilled migrants and thus confirm initial beliefs. This self-fulfilling mechanism sustains the endogenous formation of an anti or pro-immigration "prejudice". These insights may help rationalize the cross-country variation in attitudes towards immigration and choices of immigration policy.

Keywords: Immigration policy, skilled/unskilled workers, small open economy, multiple equilibria.

JEL Classification: F22, J24, J61.

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1 Introduction

Immigration policy varies across receiving countries, sometimes to a large extent. These differences reflect the perception of the relative costs and benefits of immigration for the recipient countries in terms of economic performance, redistributive consequences, effects on public finances, labor market, crime, capacity to integrate, etc.[1] Costs and benefits are affected by both the *size* and the *quality* of the migrant population. In particular, several theoretical arguments suggest that "skilled" migrants are more beneficial to the receiving country than "unskilled" migrants, such as: positive spillovers of skilled migrants for the receiving economy, higher production complementarities between skilled labor and capital, greater flexibility of the skilled labor market. Another popular argument is the fiscal cost that low-skill migrants potentially impose on natives when the receiving country implements redistributive policies or other welfare programs favoring low-skill workers (and thus low-skill migrants).[2]

If unskilled migrants are more costly (or less beneficial) than skilled migrants, it would be reasonable to expect that, over time as well as across countries, an "adverse" skill composition be associated with more pessimistic views on immigration among natives and more restrictive immigration policies. Empirical evidence confirms this claim. In a two-century historical overview of migration inflows, Hatton and Williamson (2004) show that a deterioration of the quality of immigrants has been concomitant with stronger opposition to immigration and a tightening of immigration policy. More recently, Hanson, Scheve and Slaughter (2007) emphasize the role of the skill composition of the immigrant population in determining individuals' views on immigration within the states of the US.[3] They find that individuals in the US are more opposed to immigration in states with relatively less skilled immigrant populations. As shown in Giordani, Ruta and Tai (2009), similar results hold in an analysis of individual attitudes

[1] See Facchini and Mayda (2008).

[2] For a survey of these arguments see Borjas (1995).

[3] A growing recent empirical literature studies the determinants of individual attitudes towards immigration. This literature suggests that attitudes depend on several factors such as individuals' skill level, the exposure of an individual to the fiscal consequences of immigration and the size of the immigrant population. Recent contributions include Scheve and Slaughter (2001), Mayda (2006), O'Rourke and Sinnott (2006), Facchini and Mayda (2007).

towards immigration in OECD countries.

Notwithstanding this difference in the welfare effects of migrants with different skills, non-selective policies have historically been the dominant form of restriction to immigration in OECD countries, notable exceptions being Australia, Canada and New Zealand. In this paper, we argue that a non-selective policy may affect the perception that natives have on immigration. In a nutshell, non-discriminatory restrictions worsen the skill composition of immigration and, hence, have a negative effect on natives' immigration sentiments. These insights may help rationalize the cross-country variation in attitudes towards immigration and choices of immigration policy.[4]

Specifically, we build a model of immigration which allows us to discuss the relationship between the migratory choices of skilled and unskilled foreign workers, natives' beliefs on the benefits of immigration and immigration policy in the destination countries. The size and the skill composition of the incoming migrant labor force affect the welfare of a society and hence its choice of migratory restrictions. This choice, however, in turn affects the size and the quality of the migrant population. From this mutual interaction multiple (self-confirming) equilibria may arise, which are triggered by natives' beliefs on the welfare effects of immigration. In particular, if a society believes that immigration will be mostly unskilled and costly (i.e. has an *anti-immigration prejudice*), it will choose high restrictions to the entry of foreign workers. In equilibrium, strict immigration policies that are not skill selective reduce the number of high-skill migrants (for reasons which will soon be clarified), in which case immigration will be relatively more costly and social beliefs will be self-fulfilled. If instead a society believes that immigration will be beneficial (i.e. has a *pro-immigration prejudice*), it will set low restrictions, thus increasing the number of high-skill migrants and making these beliefs self-confirmed as well.

Our analysis begins with a simple two-country model as a useful benchmark (Section 2). In this model there are a sending and a receiving region. The latter is populated by - skilled and unskilled

[4]For instance, according to the ISSP National Identity Survey 1995, Australia, Canada and New Zealand are among the less hostile countries towards immigration. See O'Rourke and Sinnott (2006).

- workers and capitalists. The pool of workers -potential immigrants- populating the sending country is composed of high and low-skill workers. The model has two key features. The first is that both migration choices and migration policy are *endogenous*. The former depend on the economic incentives that foreign workers face, and on the policy regulating migratory flows enacted in the receiving country.[5] Immigration policy in our set-up is parametrized by a cost borne by (high and low skill) immigrants once in the destination country. The second important feature of the model is the assumption that low-skill migrants are more costly than high-skill migrants. This is rationalized via the existence in the receiving country of *social policies*, redistributing income in favor of low-skill (native and foreign) workers. After defining the objective function of the government in the destination country as a weighted average of the utility of native workers and capitalists, we characterize the politically-optimal immigration policy for the host country.

A simple two-country model neglects two salient features of migratory choices. First, foreign workers often choose not only whether to migrate or not but also, to a certain extent, which country to move to. Secondly, high-skill and low-skill migrants are not equally free in making this choice. Over the last few years a growing literature has focused attention on the determinants of migratory choices across skilled and unskilled migrants.[6] A key empirical finding is that the choice of low-skill migrants is more *constrained* relative to high-skill migrants by such factors as geographical distance, cultural distance, colonial origin, network effects (because of more stringent poverty constraints or lower adaptation capacity to diversity). While other factors, such as technology, may also limit the destination choice of skilled migrants, the evidence on the actual distribution of foreign born workers shows that unskilled migrants concentrate in fewer receiving countries relative to the skilled.[7] Put it differently, this evidence confirms the presumption

[5] While most theoretical contributions on immigrants' self-selection are based on a partial equilibrium analysis, we consider the effects of immigration policy on the equilibrium wage and how, in turn, this affects economic incentives to migration for skilled and unskilled foreign workers (and, hence, the skill composition of migrants in the receiving region). On this, see also the recent works by Bellettini and Berti Ceroni (2007) and Bianchi (2007).

[6] See, among others, Mayda and Patel (2007), Belot and Hatton (2008), Doquier et al. (2008), McKenzie and Rapoport (2006).

[7] Docquier et al. (2008) use a dataset describing the stock of foreign born workers in all OECD countries by education

that -in relative terms- high-skill migrants are more *internationally mobile*.

In Section 3, we extend the simple two-country model in order to capture these features. We assume that the sending and receiving countries are, respectively, part of larger sending and receiving regions. In particular, the receiving country is a *small open economy* which shares the same preferences and technology with the rest of the receiving region and can decide independently its immigration policy, without any effect on the rest of the region. In this framework we capture the higher international mobility of high-skill migrants by assuming that they can choose to emigrate to a larger set of destination countries relative to unskilled migrants. As a result of this assumption, a new effect of immigration policy on the composition of incoming foreign labor force arises. A restrictive immigration policy in the small open destination country will reduce the number of high-skill workers, as they will choose to migrate where restrictions are lower (*crowding out* effect). In contrast, a soft immigration policy will increase the number of high-skill migrants, in that it will attract them from the rest of the region (*crowding in* effect). This mechanism is at the root of the results we obtain.

We prove that, when a small economy in the receiving world decides immigration policy independently and taking as given the policy of the rest of the region, multiple equilibria arise which depend on the country's expectations on the quality of immigration -i.e. the expected number of high-skill foreign workers potentially entering the destination country. In the first equilibrium, the economy benefits of a *high-skill immigration boom* which is driven by optimistic expectations on the number of high-skill migrants. If the policy maker anticipates that a relatively large number of highly skilled foreign workers will be entering the country (and, hence, that the effects of immigration on the destination country will be largely positive), it will rationally set low restrictions to immigration. The effect of low barriers to immigration will be to attract -highly mobile- skilled migrants (crowding in effect) and, hence, to validate

level and country of origin. They compute bilateral concentration indexes, which capture how migrants from each source country are distributed within all OECD nations, for both low and high-skill foreign born workers. Through a detailed comparison of these indexes, they show that unskilled migrants tend to be more concentrated than skilled migrants.

initial beliefs. In the second (and opposite) equilibrium, the small economy can be stuck in an *unskilled immigration trap*, driven by pessimistic expectations. In particular, suppose that the government has pessimistic beliefs about the quality of immigration. The rational response to this belief would be to impose higher barriers to immigration than the rest of the region (as the presence of the welfare state costs of a mostly unskilled migrant inflow may render immigration more costly to the destination country). Given the skilled migrants' freedom of choice, this policy will have the effect of crowding them out. The composition of immigration in this country will then be biased towards low-skill immigrants, thus validating the initial pessimistic belief. We show that welfare is lowest for the receiving country under the "unskilled immigration trap" and highest under the "high-skill immigration boom".

A key insight follows from this analysis which is radically different from a simpler two-country world. The self-fulfilling mechanism described above may sustain the endogenous formation of a *prejudice* pro or against immigration. Given the nature of the equilibrium, these prejudices will be difficult to change and, therefore, even small differences in initial perceptions may induce large and persistent differences in immigration policy and outcomes across countries. In particular, our analysis raises the theoretical possibility that the hostility against immigrants may have resulted from a combination of pessimistic expectations and the non-selective barriers to immigration historically adopted by most receiving countries. This is complementary to explanations that emphasize the role of "fundamentals", such as the size of redistributive programs or the substitutability between natives and migrants in labour markets, as determinants of public perceptions of immigration.

Finally, in Section 4 we comment on the robustness of our results. In particular we show that, while our key finding is robust to different or more general theoretical frameworks, the multiplicity of equilibria disappears if the government introduces a discriminatory immigration policy that selects for the skills of foreign workers. This is important for two reasons. First, while (as noticed by Hatton and Williamson, 2004) family reunification still constitutes a major plank of immigration policy for permanent

immigrants, policies that select for the skills of foreign workers are becoming empirically more relevant in recent years, as a growing number of Western countries are changing their rules on immigration (e.g. the recent proposal of the Blue Card in the European Union). Second, this extension highlights a novel effect of skill selective policies on destination countries. Suppose that a receiving economy has (historically) in place a non discriminatory policy and is stuck in an unskilled immigration trap, as defined above. A switch from non discriminatory to a skill selective policy improves the quality of migrants and the attitudes of natives towards immigration and, ultimately, may eradicate the prejudice and dig the economy out of the trap with unambiguously positive effects on natives' welfare.

The rest of the paper is organized as follows. In the next section we introduce as a benchmark the two-country model, analyze the migration choice of skilled and unskilled foreign workers and find the politically optimal immigration policy for the receiving country. In Section 3 we extend the model to consider a small open receiving economy, analyze the new migration choice, and derive and discuss the policy equilibria for the small economy. Section 4 discusses the extensions to our framework. Concluding remarks are in Section 5, while all proofs are in the technical appendix.

2 A Two-Country Model of Immigration

Let us assume that the world is made up of a receiving country, or "home", (H) and a sending country, "foreign" (F). The focus of our analysis is on the effects of migratory flows and immigration policy on the receiving country.

There are three key sets of actors in the economy: agents in the receiving country, that will be referred to as 'natives', who express their preferences over immigration policy; foreign workers, who choose whether to migrate or not; and the home government, which decides immigration policy to maximize (a weighted average of) natives' welfare. In H there are N_H workers, a fraction of whom are skilled. We denote by S_H the number of skilled, and by $U_H = N_H - S_H$ the number of unskilled native workers.

Each native worker is endowed with one unit of labor, which is inelastically supplied on the (competitive) labor market. Individual labor supply is higher in efficiency units for skilled agents than for unskilled (see below). H is also populated by a number K of native capitalists, each of whom is endowed with one unit of capital. Population in F is made up of workers, denoted by $N_F = S_F + U_F$ with the same notation for skilled/unskilled. Natives' and migrants' utility is linear in their (disposable) income, which is entirely spent to consume the unique final good produced in the economy.

2.1 Home Technology and Social Policy

The final good is produced competitively via a Cobb-Douglas technology in *effective* labor (L) and in a fixed factor (capital, denoted by K):[8]

$$Y = K^{\alpha} L^{1-\alpha}. \tag{1}$$

From first order conditions we obtain factor demands, for respectively capital, unskilled and skilled labor as

$$r_H = \alpha \left(\frac{K}{L}\right)^{\alpha-1}, \tag{2}$$

$$w_H \varepsilon_u = (1-\alpha) \left(\frac{K}{L}\right)^{\alpha} \varepsilon_u, \tag{3}$$

$$w_H \varepsilon_s = (1-\alpha) \left(\frac{K}{L}\right)^{\alpha} \varepsilon_s, \tag{4}$$

[8] This type of technology is also used in Bellettini-Berti Ceroni (2007) and Brauninger-Vidal (2000). In Section 4 we will argue that none of the assumptions we make on the technology of the receiving economy is crucial to obtain our results.

where r_H is capital rent, $w_H = (1-\alpha)(K/L)^{\alpha}$ is the level of wage per efficiency unit of labor, and ε_s and ε_u denote the productivities of skilled and unskilled workers respectively, with $\varepsilon_s > \varepsilon_u$. Effective labor supply of natives is

$$L_H = \varepsilon_s S_H + \varepsilon_u U_H. \tag{5}$$

Total effective labor supply (L) includes foreign labor supply in addition to natives', where foreign labor supply is endogenously determined.

Last, we assume that region H has a social policy that redistributes labor income from high-skill to low-skill workers. The welfare system in the receiving region is assumed to be pre-existent to immigration.[9] In particular, we suppose that this policy consists of an exogenous and fixed lump-sum transfer γ_u to (native and foreign) unskilled workers which is financed through a proportional tax $\tau \in [0,1]$ on the labor income of native high-skill workers.[10] As we will see below, social spending in presence of immigration depends on the (exogenous) size of the transfer (γ_u) as well as on the (endogenous) number of unskilled migrants entering country H. To introduce the balanced budget constraint in presence of immigration, therefore, we first need to deal with the migration choice.

2.2 The Migration Choice

We now introduce the possibility of international labor movements and study the determinants of migratory decisions. Migration is assumed to be a one-time and non reversible decision. The general idea is that immigrants who have high levels of productivity not only benefit from emigrating, but they can

[9] The assumption of an exogenous and fixed welfare system is reasonable when the size of the migrant labor force is low relative to the size of the native population. When this is not the case, one can think that the domestic government chooses the social policy having in mind its effect on migratory flows. We do not pursue this question here. See Casella (2005) for a multi-country model which studies the joint determination of immigration and redistributive policy.

[10] Naturally, one can model the social policy in the receiving region in a number of different ways (for instance, by introducing a proportional income tax, or taxing capital rather than skilled labor, or imposing redistributive taxation to high-skill migrants in addition to skilled natives, etc.). These alternative formalizations would generally not alter the logic of our results as long as the social policy implies a net transfer of resources from natives to unskilled foreign workers.

also make a significant contribution to the economy of the receiving country. Conversely, if immigrants lack the skills that employers in the host country demand, they can still choose to migrate to receive social assistance programs. In this case, natives may be concerned that immigration will increase the costs associated with income maintenance policy in the receiving country.

In F the wage rate is assumed exogenous and denoted by w^*. We call the productivities for foreign skilled and unskilled workers respectively $\varepsilon_s^*, \varepsilon_u^*$. For simplicity we assume that the former have positive productivity, while foreign unskilled are unproductive (i.e. $\varepsilon_s^* > \varepsilon_u^* = 0$). We will discuss the case in which $\varepsilon_u^* > 0$ in Section 4.[11] If foreign workers choose to remain in the sending country, their wages are respectively given by $w^*\varepsilon_s^*$ and $w^*\varepsilon_u^* = 0$. The wage incentive to migrate is higher for skilled rather than for unskilled workers. In fact,

$$(w_H - w^*)\varepsilon_s^* > (w_H - w^*)\varepsilon_u^* = 0,$$

that is, the increase in wage is higher for skilled than for unskilled (this holds true even when $\varepsilon_u^* > 0$, to the extent that $\varepsilon_u^* < \varepsilon_s^*$).

We assume that each immigrant i - whether skilled or unskilled - faces a psychological cost to leave her own country, θ_i, which is uniformly distributed in $[0, \bar{\theta}]$. In addition, the government in H can set up an immigration policy which is parametrized by a cost borne by immigrants once in the new country, $\mu_H \in \mathbb{R}_+$. One can interpret μ_H in several ways, from the number of bureaucratic procedures (i.e. the time a worker needs to spend applying for a work permit in the receiving country, which implies an opportunity cost for the applicant), to laws that affect the life of immigrants in the host country, such as the number of years to obtain voting rights or citizenship. This policy is assumed to be non-discriminatory.[12]

[11] In particular, we will argue that introducing $\varepsilon_u^* > 0$, a part from rendering the model analytically less manageable, does not alter our results.

[12] In Section 4 and in the Conclusions we come back on the issue of prejudice and selective immigration policies.

We start by considering the policy variable μ_H as exogenous and look at migratory decisions. In the next section we endogenize the policy choice. A skilled foreign worker i will migrate if and only if

$$w_H \varepsilon_s^* - \mu_H - \theta_i \geq w^* \varepsilon_s^*, \tag{6}$$

while an unskilled foreign worker i will migrate if and only if

$$\gamma_u - \mu_H - \theta_i \geq 0. \tag{7}$$

Quite naturally, foreign workers will migrate into the home country if and only if the utility they can reach there -the (endogenous) home wage rate times their own productivity or the lump-sum transfer in the case of unskilled migrants, minus the costs of migration- is higher than the utility they can achieve in the sending country -the (exogenous) foreign wage rate times their productivity.

We can then find the two threshold values of θ, call them θ_s and θ_u respectively for skilled and unskilled, such that all those below that value are willing to migrate. We have

$$\theta_s = (w_H - w^*)\, \varepsilon_s^* - \mu_H \tag{8}$$

and

$$\theta_u = \gamma_u - \mu_H. \tag{9}$$

All skilled workers whose θ is lower than θ_s, and all unskilled workers whose θ is lower than θ_u are willing to migrate. If both skilled and unskilled foreign workers are distributed uniformly in $[0, \bar{\theta}]$, the number of skilled and unskilled migrants will be respectively $(\theta_s/\bar{\theta})S_F$ and $(\theta_u/\bar{\theta})U_F$.[13]

[13] Before proceeding let us just notice that condition (8) holds true to the extent that it is positive and lower than $\bar{\theta}$. Whenever $(w_H - w^*)\, \varepsilon_s^* - \mu_H < 0$, then $\theta_s = 0$, while if $(w_H - w^*)\, \varepsilon_s^* - \mu_H > \bar{\theta}$, then $\theta_s = \bar{\theta}$. The same is true, *mutatis mutandis*, for θ_u.

In this model, whether there is 'positive', 'negative' or 'neutral' self-selection depends on the generosity of the transfer program (γ_u). In particular,

$$\theta_u \gtreqless \theta_s \Leftrightarrow \gamma_u \gtreqless \widehat{\gamma}_u = (w_H - w^*)\,\varepsilon_s^*.$$

With a low transfer ($\gamma_u < \widehat{\gamma}_u$), there will be positive self-selection ($\theta_u < \theta_s$), with a high transfer ($\gamma_u > \widehat{\gamma}_u$), there will be negative self-selection ($\theta_u > \theta_s$). In only one case ($\gamma_u = \widehat{\gamma}_u$), the proportions will be identical ($\theta_u = \theta_s$).[14]

The amount of effective foreign labor supply in H will then be

$$L_F = \varepsilon_s^* \frac{\theta_s}{\bar{\theta}} S_F. \tag{10}$$

where θ_s is given by (8). As low skill foreign workers are unproductive, they do not affect the effective foreign labor supply in the domestic economy. Aggregate labor supply includes the migrant labor force and the (exogenous) natives' labor supply, both in efficiency units, that is, $L = L_H + L_F$. As the fraction of high skill foreigners that choose to migrate ($\theta_s/\bar{\theta}$) depend on the home wage rate w_H, so does the aggregate labor supply in efficiency units, L. In particular, the aggregate labor supply in efficiency units L is increasing in the wage rate, w_H.[15] While domestic labor supply (L_H) is fully inelastic, a higher wage rate in the receiving country increases the emigration benefits for skilled workers and positively affects their fraction, thereby raising the foreign component of the aggregate labor supply (L_F).

Last, we can find the tax rate that balances the budget of the income support program in presence of

[14] Several studies (Chiquiar and Hanson (2005), Hatton and Williamson (2004) and Brucker and Defoort (2006) among others) document that migrants are not a random sample of the population of the sending region. In particular, the idea that the generosity of the welfare system in destination countries serves as a magnet to unskilled migrants is not new and is largely supported by the empirical evidence. See Cohen and Razin (2008) and the references therein for recent findings and a discussion of this point.

[15] Total effective labor supply with immigration is given by $L = L_H + L_F = \varepsilon_s S_H + \varepsilon_u U_F + \varepsilon_s^* \left(\theta_s/\bar{\theta}\right) S_F$, where θ_s is given by (8) and is a linear function of w_H. Substituting for this condition into the aggregate labor supply in efficiency units and taking derivative with respect to w_H, we get $dL/dw_H = \left(\varepsilon_S^*\right)^2 S_F/\bar{\theta} > 0$.

immigration. Social spending will be equal to the transfer per worker (γ_u) times the number of workers who benefit from the transfer $\left(U_H + \left(\theta_u/\bar{\theta}\right) U_F\right)$, where the expression in brackets denotes the total number of unskilled workers in country H (i.e. domestic and foreign). A balanced budget implies

$$\tau \varepsilon_s w_H S_H = \gamma_u \left(U_H + \frac{\theta_u}{\bar{\theta}} U_F \right),$$

and, hence, the tax rate on skilled labor income is

$$\tau = \frac{\gamma_u \left(U_H + \frac{\theta_u}{\bar{\theta}} U_F \right)}{\varepsilon_s w_H S_H}, \tag{11}$$

where θ_u is itself a function of γ_u.

2.3 The Politically Optimal Immigration Policy at Home

In this subsection we determine the politically optimal immigration policy for the receiving country. Our first step is to find the equilibrium in the Home labor market and to investigate the effects of immigration policy (μ_H).

The equilibrium in the domestic labor market with immigration is determined by the intersection of the labor demand curve and the total (i.e. augmented for immigration) effective labor supply:

$$\begin{cases} w_H = (1-\alpha) \left(\frac{K}{L}\right)^{\alpha} \\ L = \varepsilon_s S_H + \varepsilon_u U_H + \varepsilon_s^* \frac{(w_H - w^*)\varepsilon_s^* - \mu_H}{\bar{\theta}} S_F, \end{cases} \tag{12}$$

where we used the threshold value θ_s given by condition (8) into the aggregate labor supply in efficiency units.

The traditional labor demand is decreasing in the wage rate, while effective labor supply is linearly increasing in w_H. Hence, the system above determines the equilibrium wage rate (w_H), the amount of effective labor (L), and hence the number of skilled migrants for a given immigration policy. Figure 1

provides a graphical intuition of the equilibrium in the domestic labor market.

INSERT FIGURE 1 HERE

An increase in migratory costs (μ_H) in the receiving country alters the equilibrium in the domestic labor market and the two key prices in the model economy: the wage rate and the rate of return on the fixed factor. The policy variable μ_H affects directly the number of immigrants (and, hence, the effective labor supply) by changing the incentives to migrate. The higher μ_H, the lower the labor supply and the higher the wage rate (i.e. the labor supply curve in Figure 1 shifts upward). On the other hand, as the amount of capital is fixed in the receiving country, the lower labor supply depresses rents.

Previous statements are true to the extent that immigration policy is not already at one of its two boundary values. In fact, in our formulation there exist an upper and a lower bound beyond which a change in μ_H has no effect on the number of migrants. For instance, if μ_H is such that all foreign workers are already willing to enter, a further decrease has no effect on immigration. Symmetrically, if μ_H is such that no foreign worker is willing to enter, a further increase has no effect on immigration either. Before turning to the study of the optimal immigration policy, let us define these lower and upper bounds. We define "open door" policy ($\underline{\mu_H}$) and "closed door" policy ($\overline{\mu_H}$) as the policies which induce, respectively, *all* foreign workers and *no* foreign worker to emigrate to H (a formal definition of these policies is given in Appendix).[16] To the extent that $\mu_H \in \left(\underline{\mu_H}, \overline{\mu_H}\right)$, comparative statics analysis of immigration policy can be summarized in the following

Lemma 1. *A restriction of immigration policy in the home economy (i.e. increasing μ_H) 1. decreases equilibrium effective labor by reducing immigration ($dL/d\mu_H < 0$); 2. increases the domestic*

[16] Notice also that, since the policy maker faces no cost in lowering μ_H below $\underline{\mu_H}$ or raising μ_H above $\overline{\mu_H}$, and that migration flows are unaffected by that decrease/increase, in principle any $\mu_H < \underline{\mu_H}$ and any $\mu_H > \overline{\mu_H}$ represent respectively an "open door" and a "closed door" policy. We restrict μ_H to belong to $\left[\underline{\mu_H}, \overline{\mu_H}\right]$.

equilibrium wage rate ($dw_H/d\mu_H > 0$); 3. reduces the rent on the fixed factor ($dr_H/d\mu_H < 0$); 4. reduces unskilled migration ($d\theta_u/d\mu_H < 0$) and skilled migration ($d\theta_s/d\mu_H < 0$).

We now turn our attention to the welfare effects of immigration policy and its politically optimal choice from the point of view of the receiving country. The utility of a skilled worker in the domestic economy is given by her after-tax labor income $u_s = (1-\tau)w_H\varepsilon_s$. Unskilled native workers instead benefit from the transfer program γ_u and their utility is $u_u = w_H\varepsilon_u + \gamma_u$. Finally, the utility of each capitalist is simply given by r_H.

We assume that the objective function of the government of the receiving country is a weighted sum of the utilities of native capitalists and native workers. Summing over the utilities of all natives (recalling that $L_H = \varepsilon_s S_H + \varepsilon_u U_H$), and weighing capitalists' utility and workers' utility respectively by a, $1-a$ (with $a \in [0,1]$), this objective function can be expressed as

$$W_H(\mu_H) = a \cdot r_H(\mu_H) K + (1-a) \cdot \left(w_H(\mu_H) L_H - \gamma_u \frac{\theta_u(\mu_H)}{\bar{\theta}} U_F \right), \tag{13}$$

where we substituted for τ given in condition (11).

In this model immigration has clear redistributive effects on the native population. In particular, the entry of foreign workers hurts native workers (by lowering their wage and, at least for the skilled native workers, by increasing their tax rate τ), and benefits capitalists (by raising their rent).[17] The policy maker might not be neutral with respect to the distributional consequences of immigration. The weight a captures this concern of the policy maker over the two groups of natives: the higher a, the greater the importance of the capitalists' utility in the definition of welfare and hence, *coeteris paribus*, the higher the evaluation of the benefits from immigration.[18]

[17] The existence of these redistributive effects is due to the hypothesis that the capital stock is fixed. Notice, however, that none of the results in this paper hinges upon this assumption. We further discuss this issue in Section 4.

[18] If the "political" weight were equal to 1/2, the objective function of the government would correspond to social welfare. As it is well understood from the theory of collective action (Olson, 1965), however, governments tend to favor (i.e. give a higher weight in their objective function to) better organized special interests. This may explain deviations from pure

The politically optimal immigration policy ($\hat{\mu}_H$) for the receiving country is the one which maximizes the policy maker's objective function (13). Immigration policy (μ_H) affects the utility of native *workers* through two channels. First, directly, by influencing the number of immigrants and, therefore, the fiscal cost of immigration ($\gamma_u \theta_u / \bar{\theta} U_F$) through its effect on threshold θ_u (see condition (9)). Second, immigration policy affects the effective labor supply and the wage rate w_H. The effect of immigration policy on the utility of native *capitalists* works through the rent on the fixed factor, r_H.

Whether the optimal immigration policy is an "open door" ($\underline{\mu_H}$), "closed door" ($\overline{\mu_H}$) or an "intermediate" policy - $\hat{\mu}_H \in \left(\underline{\mu_H}, \overline{\mu_H}\right)$, in which the number of immigrants is a positive and proper fraction of the sending country's population - depends on both a and γ_u. For instance, if $a = 1$ ($a = 0$) the government perceives immigration to be only beneficial (costly), and the politically optimal policy will be an "open door" ("closed door") policy. More generally, lower values of a and/or higher values of γ_u are associated with stricter immigration policies. This is hardly surprising when one thinks that both a decrease in a and an increase in γ_u represent an increase in the costs associated to immigration. The politically optimal immigration policy is characterized in the following

Proposition 2. *The politically optimal degree of restrictiveness of immigration policy ($\hat{\mu}_H$) depends on both the distributional concerns of the policy maker (a) and on the generosity of social policy (γ_u). There always exist combinations of parameters a and γ_u for which the policy maker partially limits migratory inflows by optimally trading off the costs and the benefits from immigration, - that is, for which $\hat{\mu}_H \in \left(\underline{\mu_H}, \overline{\mu_H}\right)$. Moreover, the higher $1-a$ and/or γ_u, the more restrictive the politically optimal policy.*

In the extension we develop in the next section we focus on the empirically more relevant case where immigration policies are "partially" restrictive.

welfare maximization. Facchini, Mayda and Mishra (2007) employ a lobbying model and provide a micro-analytic foundation to the political economy representation that we use in our model. Interestingly, they find empirical evidence of the over-representation of capitalists' interests in immigration policy.

3 Immigration Policy in a Small Open Economy

Most models of immigration policy have the basic two-country structure discussed in the previous section. However, as emphasized in the Introduction, this structure fails to consider two relevant features of migratory choices. First, a model with only one receiving country inevitably neglects that some foreign workers may not only decide whether to migrate or not, but also select their destination country. Secondly, low-skill migrants are generally more constrained in their choice as to where to migrate compared to high-skill migrants. We now develop an extension of the model above to incorporate these two aspects.

We assume that country H and country F are, respectively, part of a large receiving region (R) and large sending region (S). Countries H, F share with their respective regions the same technology and preferences (which are still those introduced in the two-country model of the previous section), but their factor endowments are *small* compared to them (so that changes in these countries do not affect the rest of the regions). We can easily capture this structure by imagining that H and F are two zero-mass countries in two intervals $[0, 1]$, representing the measures of both receiving and sending regions. Country H is allowed to set up immigration policy μ_H independently.

We then assume that unskilled foreign workers populating F can only migrate to H, and that unskilled foreign workers migrating to H can only come from F. This implies that the population of unskilled foreign workers potentially migrating to country H is still U_F. The number of unskilled migrants in country H will then be $\left(\theta_u/\bar{\theta}\right) U_F$ where θ_u is the threshold value of the psychological cost below which unskilled foreign workers find it profitable to migrate.

Skilled foreign workers, instead, are more internationally mobile relative to low-skill foreign workers as they have more freedom in choosing their destination country. This we capture by assuming that there exists a number of skilled foreign workers who choose not only whether to migrate or not, but also which country to move to. Intuitively, we are now going to assume that not all skilled migrants in H come

from F (some may come from the rest of the sending region, S), and not all skilled migrants from F go to H (some may go to the rest of the receiving region, R). In particular, we suppose that total skilled foreign workers targeting H are $S_F\overline{\Psi}$ where $\overline{\Psi} > 1$. This pool is made up of two subsets, one which is "constrained" to migrating to country H, $S_F\underline{\Psi}$ where $0 \leq \underline{\Psi} < 1$, the other, $S_F\left(\overline{\Psi} - \underline{\Psi}\right)$, which is "free" to target country H as well as the rest of region R.[19] All skilled foreign workers targeting H compare the pay-off they would obtain from H to the one from their country of origin. The "free" group, however, also compares the pay-off from migrating to H to the one from migrating to R. The number of skilled migrants will then be $\left(\theta_s/\overline{\theta}\right) S_F\Psi_H$, where θ_s is the threshold value of the psychological cost, and Ψ_H is a function which varies between $\underline{\Psi}$ and $\overline{\Psi}$.

Notice that the assumption of low-skill migrants "completely constrained" and high-skill migrants "partly free" is only made for simplicity and is without loss of generality. What drives our results is the assumption that high-skill foreign workers be relatively less constrained in their migratory choices than low-skill foreign workers.

We focus on the equilibrium characterization of country H while supposing that the rest of the receiving region has been implementing the politically optimal immigration policy $\hat{\mu}_R$. Since country H is simply a "scaled down" version of region R, our results on the politically optimal policy of the previous section hold true for region R, and hence it will be $\hat{\mu}_R \equiv \hat{\mu}_H$. We characterize the mutual interaction between the policy maker in country H and foreign workers as a two-stage *sequential* game in which *(i)* the former chooses immigration policy as a function of the expected migratory inflows, *(ii)* the latter make their migratory choices depending on this immigration policy. To find the policy equilibria in country H, we analyze the behavior of the policy maker and that of foreign workers as described in points *(i)* and *(ii)*, starting with the latter.

[19] To be more precise about the country origin of this pool, we are in fact assuming that $S_F\underline{\Psi}$ is the mass of constrained skilled workers populating F, and that the residual subset of free skilled workers come partly from F -$S_F\left(1 - \underline{\Psi}\right)$-, and partly from the rest of the region, S -$S_F\left(\overline{\Psi} - 1\right)$.

3.1 The New Migration Choice

The migration choice of low-skill foreign workers is identical to that developed in the two-country model. These workers migrate to H if and only if (7) holds, from which the threshold θ_u (below which unskilled foreign workers find it profitable to migrate) is determined as in (9). Of course, in equilibrium the number of unskilled migrants entering H can be higher or lower than the previous one depending on whether immigration policy is softer or tighter than $\hat{\mu}_H$, that is

$$\frac{\theta_u}{\overline{\theta}} U_F \gtreqless \frac{\hat{\theta}_u}{\overline{\theta}} U_F \Leftrightarrow \mu_H \lesseqgtr \hat{\mu}_H.$$

where $\hat{\theta}_u$ is the equilibrium value of θ_u when $\mu_H = \hat{\mu}_H$.

Similarly, skilled foreign workers targeting country H compare their pay-off as immigrants in country H to the one from their country of origin, and migrate if and only if (6) holds, from which the threshold (8) is determined. The number of constrained skilled migrants will then simply be $\left(\theta_s/\overline{\theta}\right) S_F \underline{\Psi}$. The subset of free skilled workers, however - $S_F\left(\overline{\Psi} - \underline{\Psi}\right)$ - also compare their pay-off in H with the one they would obtain in region R, and choose country H if the former is higher than the latter. More formally,

$$\begin{aligned} w_H \varepsilon_s^* - \mu_H - \theta_i \quad &> \quad \hat{w}_H \varepsilon_s^* - \hat{\mu}_H - \theta_i \qquad (14) \\ &\Longleftrightarrow \\ \mu_H \quad &< \quad \hat{\mu}_H \end{aligned}$$

where $\hat{w}_H$ is the equilibrium wage when $\mu_H = \hat{\mu}_H$. All free skilled workers whose psychological cost is lower than θ_s will enter country H if and only if $\mu_H < \hat{\mu}_H$ (*crowding in*), while they will migrate to the rest of the region if and only if $\mu_H > \hat{\mu}_H$ (*crowding out*). When $\mu_H = \hat{\mu}_H$, these workers will be *indifferent* between country H and region R, and we assume that in this case they will distribute uniformly over the receiving region (so that $\Psi_H = 1$, and hence $S_F \Psi_H = S_F$). The number of skilled

migrants, as a function of immigration restrictions in H, will then be $\left(\theta_s/\bar{\theta}\right) S_F \Psi_H$ where

$$\Psi_H = \begin{cases} \overline{\Psi} \text{ if } \mu_H < \hat{\mu}_H \\ 1 \text{ if } \mu_H = \hat{\mu}_H \\ \underline{\Psi} \text{ if } \mu_H > \hat{\mu}_H. \end{cases} \tag{15}$$

INSERT FIGURE 2 ABOUT HERE

The sum of skilled and unskilled immigrants, $\left(\theta_s/\bar{\theta}\right) S_F \Psi_H + \left(\theta_u/\bar{\theta}\right) U_F$, is a piecewise continuous function in μ_H whose only discontinuity point is $\mu_H = \hat{\mu}_H$. It can be interpreted as the immigrants' best-response function, as it captures the optimal reaction of immigrants to any level of immigration restrictions chosen by the policy maker in H. What makes this behavior interesting, and different from the one we have illustrated in the two-country model, is the function $\Psi_H(\mu_H)$ (depicted in Figure 2), which captures the pool of high-skill foreign workers targeting country H as a function of migratory restrictions enacted in that country. This function is responsible for the discontinuity of the immigrants' best-response to immigration restrictions at point $\mu_H = \hat{\mu}_H$.

3.2 The Immigration Policy Choice

We have seen above that the migration choice of foreign workers depends on the immigration policy enacted in country H. In particular, internationally mobile skilled workers might decide not to target country H when observing a comparatively stricter policy than in the rest of the region and vice-versa. In this subsection we analyze how immigration policy in country H depends on the expected migratory behavior of foreign workers, and prove an "instrumental" result, which we are going to use in the next subsection.

We now prove that politically optimal migratory restrictions in country H ($\tilde{\mu}_H$) are a decreasing function of Ψ_H, which captures the pool of high-skill foreign workers that the policy maker expects

will target H.[20] Specifically, the policy maker in the small open economy H chooses restrictions $\tilde{\mu}_H$ to maximize

$$\begin{aligned} W_H &= a \cdot r_H(\mu_H, \Psi_H) K + (1-a) \cdot \left(w_H(\mu_H, \Psi_H) L_H - \gamma_u \frac{\theta_u(\mu_H)}{\bar{\theta}} U_F \right), \\ s.t.\ \mu_H &\in \left[\underline{\underline{\mu_H}}, \overline{\overline{\mu_H}} \right] \end{aligned}$$

where $r_H = \alpha [K/(L_H + L_F)]^{\alpha-1}$, $w_H = (1-\alpha)[K/(L_H + L_F)]^{\alpha}$, and where $L_F = \varepsilon_s^* \left(\theta_s/\bar{\theta}\right) S_F \Psi_H$ is the expected foreign labor supply. The two boundary values, $\underline{\underline{\mu_H}}$ and $\overline{\overline{\mu_H}}$, are defined, analogously to the simple two-country model, as respectively the "open door" and the "closed door" policy for country H. The crucial difference with respect to the policy problem illustrated in Section 2 is that here the immigration policy chosen by country H, $\tilde{\mu}_H(\cdot)$, depends on Ψ_H. Clearly, when $\Psi_H = 1$, the two maximum problems coincide, and hence $\tilde{\mu}_H(\Psi_H = 1) = \hat{\mu}_H$. In studying the relationship between $\tilde{\mu}_H$ and Ψ_H we assume that $\hat{\mu}_H \in \left(\underline{\mu_H}, \overline{\mu_H}\right)$,[21] and prove the following

Lemma 3. *The politically optimal immigration policy in country H, $\tilde{\mu}_H$, is a decreasing function of $\Psi_H \in \left[\underline{\Psi}, \overline{\Psi}\right]$.*

INSERT FIGURE 3 ABOUT HERE

The curve drawn in Figure 3 describes the locus of points in which immigration policy in country H is politically optimal for any value of Ψ_H between $\underline{\Psi}$ and $\overline{\Psi}$. A decrease in the expected pool of skilled foreign workers ($\Psi_H \downarrow$) is associated to a tightening of immigration policy ($\tilde{\mu}_H \uparrow$), and vice-versa. Hence, Lemma 3 implies that $\tilde{\mu}_H(\underline{\Psi}) > \tilde{\mu}_H(1) > \tilde{\mu}_H\left(\overline{\Psi}\right)$, as $\underline{\Psi} < 1 < \overline{\Psi}$.[22]

[20] Notice that the *expected* and *actual* number of free skilled foreign workers targeting H are both denoted by Ψ_H. Clearly, in equilibrium, they are indeed the same.

[21] We have already determined sufficient conditions for the existence of a unique global interior maximum in the proof of Proposition 2 in appendix. Indeed, our main results hold even when the globally optimal policy is a corner solution (under proper conditions on $\underline{\Psi}$ and $\overline{\Psi}$). We however focus on this more realistic case.

[22] The curve $\tilde{\mu}_H(\Psi_H)$ has been drawn under the assumption that $\tilde{\mu}_H\left(\overline{\Psi}\right) < \underline{\underline{\mu_H}}$ and $\tilde{\mu}_H(\underline{\Psi}) > \overline{\overline{\mu_H}}$: that is to say, when

3.3 Self-Confirming Immigration Policy

We focus on *self-confirming equilibria* à la Fudenberg-Levine (1993a). For country H an equilibrium is defined as a configuration in which *(i)* the policy maker chooses the immigration policy which maximizes her objective function given her (correct) beliefs on the migratory inflows *(ii)* foreign workers make their migration choice to maximize their utility for given immigration policy (μ_H). Our results are summarized in the following

Proposition 4. *Three policy equilibria exist in country H: 1. The "**high-skill boom**" equilibrium, where the policy in H is softer, $\tilde{\mu}_H\left(\overline{\Psi}\right) \equiv \mu_H^{soft} < \hat{\mu}_H$, and the proportion of skilled migrants over native workforce as well as welfare are higher than in the rest of the receiving region R (crowding in). 2. The "**globally optimal policy**" equilibrium, in which the policy $\tilde{\mu}_H(1) = \hat{\mu}_H$, the proportion of skilled migrants over native workforce as well as welfare are equal to those in R. 3. The "**unskilled migration trap**" equilibrium, in which the policy in H is tighter, $\tilde{\mu}_H\left(\underline{\Psi}\right) \equiv \mu_H^{tight} > \hat{\mu}_H$, and the proportion of skilled migrants over native workforce as well as welfare are lower in country H than in the rest of the receiving region (crowding out).*

A graphical intuition of this result is provided in Figure 4, where the two schedules, capturing the pool of high-skill foreign workers and the politically optimal immigration policy, intersect in three points, which constitute the policy equilibria of country H.

INSERT FIGURE 4 ABOUT HERE

In this model, expectations are self-fulfilling. In a country where the dominant belief is that few skilled migrants will enter, the government sets a restrictive immigration policy. A restrictive policy, in

skilled migrants crowd in or crowd out, the optimal policy is still an interior solution (and not, respectively, an "open door" or a "closed door" policy). The proof of Lemma 3 in appendix, however, does not rely on that assumption.

turn, "scares" - at least some - skilled foreign workers who prefer to migrate to other countries in the region. This creates a trap with few skilled migrants in H and lower welfare compared to the rest of the receiving region. The opposite -i.e. good- equilibrium with high skilled immigration and higher welfare would be triggered by a positive belief on high skilled immigration (and its welfare effects). Finally, the third possibility is that a country expects the same proportion of high-skill migrants over native population as in the rest of the region. In this case, the equilibrium implies that the policy and the welfare in country H are exactly as in region R, and beliefs are again vindicated.

While the "high-skill boom" and the "unskilled trap" are stable equilibria, the "globally optimal policy" equilibrium is unstable. The very existence of the latter indeed, crucially hinges on an assumption "disciplining" the number of high-skill migrants when $\mu_H = \hat{\mu}_H$. Under that policy high-skill migrants are indifferent as to where to migrate. For reasons of symmetric migratory behavior across the receiving region, we have found it reasonable to assume that $\Psi_H = 1$. If that were not the case, however, the equilibrium would disappear. Moreover, a small perturbation of this behavior makes the economy diverge towards either of the two equilibria (depending on whether that perturbation is positive or negative). Consider a $\pi-$perturbation of $\Psi_H = 1$, for a however small real number π. If $\pi > 0$, for lemma 3 the government reacts by slightly softening its immigration policy, that is, $\tilde{\mu}_H (1 + \pi) < \hat{\mu}_H$. Skilled migrants respond to this policy by crowding in country H, which in turn leads the policy maker to set up $\tilde{\mu}_H = \mu_H^{soft}$. The economy then converges to the high-skill boom equilibrium. Conversely, if $\pi < 0$ the government sets up a slightly tighter immigration policy. As a consequence, skilled migrants crowd out of country H, the policy maker sets up $\tilde{\mu}_H = \mu_H^{tight}$, and the economy converges to the unskilled migration trap. This reasoning is captured graphically in Figure 5.

INSERT FIGURE 5 ABOUT HERE

Finally notice that our extension has brought about rather different results from the baseline model.

First, the globally optimal policy equilibrium, which is the only equilibrium of the two-country model, is unstable, and its existence crucially hinges on the assumption of complete symmetry. Secondly, two new policy equilibria emerge, the high-skill boom and the unskilled migration trap. As discussed in the next subsection, these equilibria respectively rationalize the formation of a pro- and an anti-immigration prejudice. A situation that could never materialize in a two-country world.

3.4 Endogenous Immigration Prejudices

We interpret our policy equilibria as *self-confirming equilibria* in the sense of Fudenberg and Levine (1993a).[23] In a self-confirming equilibrium each player plays her best response to her beliefs on the opponent's behavior, and beliefs must be correct *along the equilibrium path*. The peculiarity of this equilibrium is that it is in fact compatible with incorrect beliefs *off* the equilibrium path, also called "superstitions". The self-confirming equilibrium is a generalization of the Nash equilibrium, whose rationale can be briefly explained as follows. If it is true that "non-cooperative equilibria should be interpreted as the outcome of a learning process, in which players revise their beliefs using their observations of previous play" (Fudenberg-Levine, 1993a, p. 523), the concept of self-confirming equilibrium captures the idea that players tend to learn - and hence to have correct beliefs on - their opponents' behavior along the path followed by the equilibrium but not (necessarily) in contingencies that are in fact never played.

If we follow this logic, the "anti-immigration prejudice" may be interpreted as the policy maker's conviction that the pool of skilled foreign workers potentially entering country H simply be $S_F\underline{\Psi}$. This conviction in fact contains a "superstition" (namely, an off-the-equilibrium incorrect belief), that when the policy maker sets up a soft immigration policy, the pool of high-skill foreign workers will still be $S_F\underline{\Psi}$. Indeed, that is not the case, since the size of the pool is disciplined by (15). The policy maker of a

[23] The self-confirming equilibrium has recently found several applications in the macroeconomic literature. For instance, Sargent et al. (2006) develop a theory of inflation based on this concept. In Alesina and Angeletos (2005), the two policy equilibria - the European high-redistribution equilibrium and the US low-redistribution equilibrium - may also be interpreted as self-confirming equilibria. For a concise review of macroeconomic applications of this concept refer to Fudenberg and Levine (2007).

country which is stuck in an unskilled migration trap, however, ignores it, and the reason why she ignores it is that she never observes it. The only thing she observes is what happens along the equilibrium path, in which the pool of high-skill foreign workers is $S_F\underline{\Psi}$. In other words, no evidence ever emerges which contradicts the policy maker's belief, which can in principle be sustained forever to the extent that play follows the equilibrium path.

An analogous interpretation could be given to the "pro-immigration prejudice". Driven by the optimistic belief that most skilled foreign workers will target country H ($S_F\overline{\Psi}$), the policy maker sets up a soft policy which will in fact attract most skilled immigrants. Notice, however, that this is not the only possible interpretation of the high-skill boom equilibrium. In fact, this solution does not need any off the equilibrium "superstition" and can be sustained as a subgame-perfect equilibrium.

One might argue that a policy maker which is stuck into the unskilled migration trap might experiment alternative paths and eventually learn her mistake. As argued by Fudenberg and Levine (1993b), superstitions may vanish if players are patient enough to carry out a sufficient amount of *experimentation* off the equilibrium. In our theoretical framework, deviating from the restrictive policy could in principle help the policy maker learn the migratory behavior of free skilled foreign workers (as captured by (15)), and thus eradicate the superstition. Notice, however, that a "timid" reduction of migratory restrictions would not be sufficient to reach this goal. As is apparent from Figure 5, along the unskilled migration trap the policy maker -implementing policy μ_H^{tight}- always observes $\Psi_H S_F = \underline{\Psi} S_F$, and any "experimentation" in the whole "policy region" between μ_H^{tight} and $\hat{\mu}_H$ would not bring any evidence of $\Psi_H \neq \underline{\Psi}$. In other words, unless the policy maker opens up migration policy at or above $\hat{\mu}_H$, she will never observe any change in the pool of skilled foreign workers targeting H. Under the principle that "you learn what you observe", the policy maker would then need to soften "remarkably" her immigration policy to be able to learn her mistake. This sizeable shift in immigration policy might not be easy to attain, especially when observing that in the real world (1) high-skill foreign workers do not respond

instantaneously to changes in immigration policy, which may render the real learning process far more complex and slow than suggested in our simple stylized world, (2) patience may not be a major virtue of policy makers who, along the unskilled migration trap, must respond to the voters' hostility towards immigration (Facchini-Mayda, 2008).

4 Discussion

The self-fulfilling mechanism we have identified above relies on two key assumptions: in our model high-skill foreign workers are assumed to be i) more productive and ii) more "mobile" than low-skill workers. The particular form which these two hypotheses take in our framework is however immaterial. For instance, we have incorporated hypothesis i) by supposing that low skill migrants are a fiscal burden for native population, while high skill migrants benefit the receiving economy via a "classical" labor market effect (that is, by rasing capitalists' rents by more than lowering workers' wages). Whether the labor market effect is relevant or not is indeed the subject of a growing empirical literature and is still highly controversial.[24] It is however irrelevant for our purposes: we could have equivalently built a model where physical capital adjusts completely and instantaneously (and thus without any effect on wages and rents) and where the benefit from high-skill migrants might for instance run through a human capital positive externality channel. Even in that framework, it would still be true that, if the policy maker expects a relatively low number of (*more beneficial*) high-skill migrants, she finds it rational to set up a relatively restrictive immigration policy, which crowds out (*more mobile*) high-migrants and confirms initial pessimistic beliefs. In other words, the logic behind the self-fulfilling mechanism would remain unaltered.

We now explicitly discuss three extensions to our framework. First, we consider the case where low-skill immigrants have both a negative effect (due to rising welfare costs) and a positive effect (through

[24] Among many others we may cite Borjas (2003), which finds evidence of a relatively sizeable effect of immigration on native wages and Ottaviano and Peri (2006), which instead does not.

the production process) on the receiving country. Second, we discuss how our results extend to a different model where the elasticity of substitution between high-skill and low-skill workers is not infinite. Finally, we analyze the case of discriminatory immigration restrictions.

Even though less productive than high-skill migrants, low-skill migrants may still have a positive effect on receiving countries. If $\varepsilon_u^* \in (0, \varepsilon_s^*)$, low-skill migrants increase the effective foreign labor supply, which now equals

$$L_F = \varepsilon_s^* \frac{\theta_s}{\overline{\theta}} S_F + \varepsilon_u^* \frac{\theta_u}{\overline{\theta}} U_F,$$

where the threshold is $\theta_u = (w_H - w^*)\,\varepsilon_u^* - \mu_H + \gamma_u$. In this case, a surge in low-skill immigration in the host country implies increasing welfare costs, but also an increase in the effective labor supply, and hence in the potential benefits arising through this channel. Although analytically more cumbersome, this extension would bring the same qualitative results to the extent that the equilibrium immigration policy still implies a partial restriction to the migrants' incoming flows (that is, to the extent that the policy problem still admits an interior solution). The two key assumptions recalled above, which drive the self-fulfilling mechanism, would still hold in this new framework (as $\varepsilon_u^* < \varepsilon_s^*$ and $\gamma_u > 0$), and we would obtain the same results whenever the new benefits associated with low-skill migrants are not so high as to always more than offset the welfare costs.[25]

The technology that we employ does not allow for complementarities between domestic skilled (unskilled) workers and foreign unskilled (skilled) migrants. With production function (1) (and under $\varepsilon_u^* > 0$), any increase in immigration (skilled or unskilled) reduces domestic wages by augmenting the foreign component of the labor supply. The negative effect on labor income of high and low skill domestic workers is more than compensated by the positive effect on the rental rate of capital that natives own. As standard

[25] We have only briefly discussed the intuition of this case. A complete analytical treatment is however available from the authors upon request.

in these models, the immigration surplus -as this net effect is often referred to- arises because of the complementarities that exist between migrants and native-owned capital.

Consider now the alternative linear homogeneous technology which is also often used to study immigration:

$$Y = f(K, S, U),$$

where S and U are respectively the total (i.e. native plus foreign) number of skilled and unskilled workers.[26] This technology satisfies the following standard assumptions: $f_i > 0$, $f_{ii} < 0$ and $f_{ij} > 0$ (where $i, j = S, U$), that is, the two types of labor are complementary in production. Is it still true that high-skill migrants are more beneficial for the destination economy than low-skill migrants? As discussed by Borjas (1995), the answer to this question depends on the complementarity between the fixed factor (here, capital) and skilled and unskilled labor, as well as on the skill composition of the native population. If the complementarities in production between skilled workers and the fixed factor are sufficiently strong, natives gain from an improvement in the skill composition of migrants, even if the domestic labor force is predominantly skilled.[27] If this is the case, the logic of our results is unaltered within this framework. High-skill foreign workers have an unambiguous positive effect on the receiving country, as they imply a positive immigration surplus. On the other hand, unskilled foreign workers may have on net a negative effect on the receiving economy, due to the increase in the cost of welfare programs. As in Section 3, beliefs on the incoming migrant inflows determine immigration restrictions, which in turn influence migratory decisions of skilled workers and the welfare effects of immigration.

Finally, consider the case where the government of country H is able to discriminate between skilled and unskilled immigrants (i.e. filter the more productive workers). If the immigration policy can be

[26] For simplicity assume that foreign (un)skilled are identical to native (un)skilled.

[27] This conclusion is reinforced in a more general model where human capital of immigrants has external effects in production.

tailored to each skill group, the reasoning inspiring the self-fulfilling mechanism breaks down, and the multiplicity of equilibria for the small open country H disappears. Two cases, however, must be distinguished, depending on whether or not the rest of the receiving world (region R) is also able to discriminate. In the first case, the globally optimal (discriminatory) policy for the entire region will consist of setting no restriction on high-skill foreign workers, and the highest restrictions on unskilled migrants, so as to fully offset the effect of social policy. Under this immigration policy, all high-skill foreign workers and no low-skill foreign worker will migrate to region R. In this case, independently of country H's beliefs on the skill composition of the migrant labor force, the only policy equilibrium for country H would simply coincide with the globally optimal (discriminatory) policy set up in region R. In the second case, the globally optimal policy for region R would still be $\hat{\mu}_R = \hat{\mu}_H$, and the only policy equilibrium for country H would again be "no barrier on high-skill" and "high barriers on low-skill". Being the only country filtering skills, country H would then enjoy a higher number of skilled migrants ($S_F\overline{\Psi}$) and a higher welfare with respect to region R.

5 Conclusion

In most countries there is a heated debate on immigration. The mobility of people across borders has important effects on both source and destination economies. Within the receiving part of the world, for instance, several issues are at the forefront of public discussion and of academic research, including the performance of immigrants and their ability to integrate in the destination country, the impact of migrants on natives' employment opportunities, the proper design of social and labor market policy in presence of immigration. We have focused on host economies (that is, we have not addressed the effects of a diaspora on the source countries) and abstracted from several of these important issues.

This paper provides a model to investigate how attitudes towards immigration and immigration policy interact with migratory decisions. We have shown that in a setting where high skilled foreign

workers are more productive and more mobile than unskilled migrants, different perceptions on immigration lead to radically different outcomes. Optimistic beliefs on immigration induce a government to set low restrictions which attract high-skill foreign workers, while pessimistic beliefs bring high restrictions which scare skilled immigrants. This self-fulfilling mechanism will sustain the endogenous formation of a prejudice, pro or anti immigration. While clearly not the only explanation, our work sheds some light on why differences in attitudes towards immigration may be so rooted in different countries.

This analysis contributes to the discussion on the proper design of immigration policy in host countries. The model implies that the choice of the right policy may have a significant impact in the short run, as well as in the long run through the formation of attitudes towards immigration that will change only slowly. First, the small open economy setting helps us clarifying that a country must be careful in implementing restrictive immigration policies to control the migration flow. The reason is that migration policies affect not only the number of immigrants but also their quality, and a (non-selective) restrictive policy could indirectly act as an instrument of selection of the lowest quality immigrants. Secondly, while skills of foreign workers may be difficult to infer correctly, several arguments have been proposed in favor of policies that filter applicants in terms of observable skills. This paper adds to these arguments that selective policies may influence natives' attitude towards immigration and, hence, increase support for further reductions of barriers. In principle an anti-immigration prejudice could "vanish" via a combination of rules that favor more productive migrants with a more open immigration policy.

As a final remark, notice that several extensions of this model shall provide interesting novel insights on the effects of immigration policy under self-selection of migrants. Two directions may be of particular interest as they better describe real-world environments different from the one analyzed in this paper. A first extension shall consider how immigration policy in one country affects policy choices in other countries of the destination region. A second direction shall address how the joint determination of immigration and social policy in the receiving country influences beliefs and outcomes. We leave this for

future work.

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Appendix

Proof of lemma 1.

1. We first show that L_F is decreasing in μ_H. From the labor market equilibrium condition (12) we obtain the implicit function for L_F as

$$F(L_F, \mu_H) \equiv L_F - \varepsilon_s^* \frac{\left[(1-\alpha)\left(\frac{K}{L_H+L_F}\right)^{\alpha} - w^*\right]\varepsilon_s^* - \mu_H}{\bar{\theta}} S_F = 0.$$

We then use the implicit function theorem and obtain

$$\frac{dL_F}{d\mu_H} = -\frac{\frac{\varepsilon_s^*}{\bar{\theta}} S_F}{1 + (1-\alpha)\alpha\left(\frac{K}{L}\right)^{\alpha} \frac{1}{L}\frac{(\varepsilon_s^*)^2}{\bar{\theta}} S_F} < 0.$$

Given that $L = L_H + L_F$ and that L_H is exogenous, it follows $dL/d\mu_H < 0$.

2. In order to find $dw_H/d\mu_H$ we first need to characterize the implicit function for w_H, which is the following:

$$F(w_H, \mu_H) \equiv (1-\alpha)\left[\frac{K}{L_H + \varepsilon_s^* \frac{(w_H - w^*)\varepsilon_s^* - \mu_H}{\bar{\theta}} S_F}\right]^{\alpha} - w_H = 0.$$

Differentiating w_H with respect to μ_H we obtain

$$\frac{dw_H}{d\mu_H} = \frac{(1-\alpha)\,\alpha\left(\frac{K}{L}\right)^{\alpha} \frac{1}{L}\varepsilon_s^* \frac{S_F}{\bar{\theta}}}{(1-\alpha)\,\alpha\left(\frac{K}{L}\right)^{\alpha} \frac{1}{L}\left(\varepsilon_s^*\right)^2 \frac{S_F}{\bar{\theta}} + 1},$$

which is always strictly higher than zero, confirming that an increase in μ_H leads to a higher wage rate.

3. In point 1 we have proven that $dL/d\mu_H < 0$. Given that $r_H = \alpha\,(K/L)^{\alpha-1}$, and that $\partial r_H/\partial L > 0$, it follows $dr_H/d\mu_H < 0$.

4. The effect on the supply of unskilled foreign migrants of an increase in μ_H can be immediately calculated:

$$\frac{d\theta_u}{d\mu_H} = -1 < 0. \tag{16}$$

The first derivative of θ_s with respect to μ_H can be computed as follows:

$$\frac{d\theta_s}{d\mu_H} = \frac{\partial\theta_s}{\partial\mu_H} + \frac{\partial\theta_s}{\partial w_H}\frac{dw_H}{d\mu_H},$$

where $dw_H/d\mu_H$ is given in point 2, $\partial\theta_s/\partial\mu_H = -1$ and $\partial\theta_s/\partial w_H = \varepsilon_s^*$. It is now easy to show that

$$\frac{d\theta_s}{d\mu_H} = -\frac{1}{(1-\alpha)\,\alpha\left(\frac{K}{L}\right)^{\alpha}\frac{1}{L}\left(\varepsilon_s^*\right)^2\frac{S_F}{\bar{\theta}} + 1} < 0. \tag{17}$$

"Open door" and "closed door" policies.

The "closed door" policy is implicitly defined by

$$\overline{\mu_H} = \max\left\{\gamma_u, \left(w_H\left(\overline{\mu_H}\right) - w^*\right)\varepsilon_s^*\right\},$$

where $\mu_H = \gamma_u$ and $\mu_H = \left(w_H\left(\mu_H\right) - w^*\right)\varepsilon_s^*$ are, by construction, the immigration policies respectively dissuading all unskilled and all skilled foreign workers from emigrating to country H. When $\mu_H = \overline{\mu_H}$, population in H is only made up of natives ($L = L_H$ and $\theta_u = 0$), and it is easy to calculate the numerical value for welfare as (for a definition of welfare see Subsection 2.3)

$$\overline{W}_H = K^{\alpha}L_H^{1-\alpha}\left[a\alpha + (1-a)(1-\alpha)\right].$$

The "open door" policy is the one associated with the maximum number of skilled migrants, which is S_F. In order for this to be the case, μ_H must be set so that $\theta_s = \bar{\theta}$, that is, so that all skilled foreign workers find it profitable to migrate. The following equation implicitly defines the "open door" policy

for receiving country H:

$$\underline{\mu_H} = \left(w_H(\underline{\mu_H}) - w^*\right)\varepsilon_s^* - \bar{\theta}.$$

In this case population in H is made up of both natives and (all) foreigners ($L \equiv \underline{L} = L_H + \varepsilon_s^* S_F$ and $\theta_u = \bar{\theta}$).[28] The numerical value for welfare is given by

$$\underline{W}_H = K^{\alpha}\underline{L}^{1-\alpha}\left[a\alpha + (1-a)(1-\alpha)\frac{L_H}{\underline{L}} - (1-a)\gamma_u U_F\right].$$

Whether $\underline{W}_H \lesseqgtr \overline{W}_H$, and hence whether the "open door" policy is better than the "closed door" policy depends on the parameters of the economy.

Proof of proposition 2.

The policy problem consists of maximizing the following condition

$$\begin{aligned} W_H &= a \cdot r_H K + (1-a)\cdot\left(w_H L_H - \gamma_u \frac{\theta_u}{\bar{\theta}} U_F\right) \\ s.t.\ \mu_H &\in \left[\underline{\mu_H}, \overline{\mu_H}\right], \end{aligned}$$

where $w_H = (1-\alpha)(K/L)^{\alpha}$, $r_H = \alpha(K/L)^{\alpha-1}$ and $\theta_u = \gamma_u - \mu_H$. The candidate solutions to this problem are an interior maximum, $\hat{\mu}_H \in \left(\underline{\mu_H}, \overline{\mu_H}\right)$, and the two corner solutions, that is, the "open door" ($\underline{\mu_H}$) and the "closed door" policy ($\overline{\mu_H}$).

To characterize an interior solution to the maximum problem we need to compute the first and the second order conditions. The total derivative of W_H with respect to μ_H can be expressed as

$$\frac{dW_H}{d\mu_H} = \frac{dW_H}{dL}\cdot\frac{dL}{d\mu_H} + \frac{\partial W_H}{\partial \mu_H}$$

[28] Only for simplicity, and to compute welfare as function of parameters only, we are now implicitly assuming that the policy which attracts all skilled foreign workers is also able to attract all unskilled foreign workers. This is the case whenever $\gamma_u - \underline{\mu_H} \geq \bar{\theta}$.

where

$$\frac{\partial W_H}{\partial \mu_H} = (1-a)\,\gamma_u \frac{U_F}{\bar{\theta}} > 0$$

$$\frac{dL}{d\mu_H} = -\frac{\frac{\varepsilon_s^*}{\bar{\theta}} S_F}{1 + (1-\alpha)\alpha \left(\frac{K}{L}\right)^{\alpha} \frac{1}{L} \frac{(\varepsilon_s^*)^2}{\bar{\theta}} S_F} < 0,$$

and

$$\frac{dW_H}{dL} = \alpha(1-\alpha)\left(\frac{K}{L}\right)^{\alpha}\left[a - (1-a)\frac{L_H}{L}\right] \lessgtr 0.$$

The FOC can then be expressed as

$$\frac{dW_H}{d\mu_H} = (1-a)\,\gamma_u \frac{U_F}{\bar{\theta}} - \frac{\alpha(1-\alpha)\left(\frac{K}{L}\right)^{\alpha}\left[a - (1-a)\frac{L_H}{L}\right]\frac{\varepsilon_s^*}{\bar{\theta}} S_F}{1 + (1-\alpha)\alpha \left(\frac{K}{L}\right)^{\alpha} \frac{1}{L} \frac{(\varepsilon_s^*)^2}{\bar{\theta}} S_F} = 0 \tag{18}$$

where the first and the second term respectively represent the marginal costs (of a reduction in μ_H) in terms of social policy, and the marginal benefits (if positive) in terms of production. From (18) notice that marginal benefits are positive only when $a > \frac{L_H}{L} / \left(\frac{L_H}{L} + 1\right)$. A sufficient condition for this to happen for any $L > L_H$ would be to assume $a \geq 1/2$.

To check the second order condition, let us now calculate the second derivative of the government's objective function with respect to μ_H:

$$\frac{d^2 W_H}{d\mu_H^2} = \frac{d^2 W_H}{dL^2} \frac{dL}{d\mu_H}.$$

After some algebra we obtain

$$\frac{d^2 W_H}{d\mu_H^2} = -\frac{\frac{d\chi}{d\mu_H}\left[a - (1-a)\frac{L_H}{L}\right] + \chi \frac{1}{L^2}\frac{dL}{d\mu_H}\left[(1-a)L_H + a\chi\varepsilon_s^*\right]}{\left[\frac{1}{L}\chi\varepsilon_s^* + 1\right]^2},$$

where

$$\chi\left(\mu_H\right) \equiv \left(1-\alpha\right)\alpha\left(\frac{K}{L}\right)^{\alpha}\varepsilon_s^*\frac{S_F}{\bar{\theta}} > 0,$$

$$\frac{d\chi}{d\mu_H} = -\left(1-\alpha\right)\alpha^2\left(\frac{K}{L}\right)^{\alpha}\varepsilon_s^*\frac{S_F}{\bar{\theta}}\frac{1}{L}\frac{dL}{d\mu_H} > 0,$$

and where the expression for $dL/d\mu_H < 0$ is already given above.

Unfortunately neither the FOC nor the SOC can be solved explicitly for μ_H, and hence a complete characterization of the solution cannot be carried out. To prove the existence of economies characterized by a global interior maximum, we then look for a *sufficient* condition. To give an intuition, we will now prove that there exist values of $a \in (0,1)$ and $\gamma_u > 0$ such that the FOC is satisfied at an interior $\hat{\mu}_H$ and the welfare function is *everywhere* strictly concave.

By plugging the expressions for $d\chi/d\mu_H$, $dL/d\mu_H$ and $\chi\left(\mu_H\right)$ into $d^2W_H/d\mu_H^2$ we obtain that

$$\frac{d^2W_H}{d\mu_H^2} < 0 \Longleftrightarrow a > \frac{\alpha\left(\frac{L_H}{L}+1\right)}{\alpha\left(\frac{L_H}{L}+1\right)+\frac{L_H}{L}-\frac{1}{L}\chi\varepsilon_s^*} \equiv \bar{a}(\mu_H). \tag{19}$$

A sufficient condition to have $\bar{a}(\mu_H) < 1\ \forall\mu_H$ is that $L_H > \left[\left(1-\alpha\right)\alpha\left(K\right)^{\alpha}\left(\varepsilon_s^*\right)^2\frac{S_F}{\bar{\theta}}\right]^{\frac{1}{\alpha+1}}$, which only depends on parameters and in fact ensures $L_H/L - (1/L)\,\chi\varepsilon_s^* > 0$. Hence, for any $a \in (\bar{a}(\mu_H),1)$, $d^2W_H/d\mu_H^2 < 0$ everywhere, and the welfare function is strictly concave. Let us now consider the first order condition. Indeed there always exists a $\gamma_u > 0$ such that $dW_H/d\mu_H = 0$ whenever the second term in (18) is positive. As we have seen above, a sufficient condition for this to happen is that $a \geq 1/2$. Since $\bar{a}(\mu_H) \gtreqless 1/2$, then for any $a \in \{(\bar{a}(\mu_H),1) \cup (1/2,1)\}$, there always exists a positive γ_u such that $dW_H/d\mu_H = 0$. For all these economies the welfare function admits a global interior maximum, $\hat{\mu}_H \in \left(\underline{\mu_H}, \overline{\mu_H}\right)$.

We now prove that $\hat{\mu}_H$ is increasing in γ_u and decreasing in a, that is:

$$\frac{d\hat{\mu}_H}{d\gamma_u} = -\frac{\frac{dG}{d\hat{\mu}_H}}{\frac{dG}{d\gamma_u}} > 0 \text{ and } \frac{d\hat{\mu}_H}{da} = -\frac{\frac{dG}{d\hat{\mu}_H}}{\frac{dG}{da}} < 0$$

where G is the implicit function in $\hat{\mu}_H$ derived from the FOC ($dW_H/d\hat{\mu}_H = 0$). We already know that $dG/d\hat{\mu}_H = d^2W_H/d\hat{\mu}_H^2 < 0$. Since $dG/d\gamma_u = (1-a)\,U_F/\bar{\theta} > 0$, then it will be $d\hat{\mu}_H/d\gamma_u > 0$. Moreover

$$\frac{dG}{da} = -\frac{\alpha(1-\alpha)\left(\frac{K}{L}\right)^{\alpha}\left[1+\frac{L_H}{L}\right]\frac{\varepsilon_s^*}{\bar{\theta}}S_F}{1+(1-\alpha)\alpha\left(\frac{K}{L}\right)^{\alpha}\frac{1}{L}\frac{(\varepsilon_s^*)^2}{\bar{\theta}}S_F} < 0$$

implies $d\hat{\mu}_H/da < 0$.

Proof of lemma 3.

The policy maker in H has the following maximization problem:

$$\begin{aligned} \max_{\mu_H} W_H &= \max_{\mu_H}\left[a\cdot r_H K + (1-a)\cdot\left(w_H L_H - \gamma_u\frac{\theta_u}{\bar{\theta}}U_F\right)\right], \\ s.t.\ \mu_H &\in \left[\underline{\underline{\mu_H}}, \overline{\overline{\mu_H}}\right] \end{aligned}$$

where $\underline{\underline{\mu_H}}$, $\overline{\overline{\mu_H}}$ denote respectively the "open door" and the "closed door" policy for country H.[29] The expression for welfare can be rewritten as

$$W_H = \left[a\cdot\alpha\left(\frac{K}{L_H+L_F}\right)^{\alpha-1}K + (1-a)\cdot\left((1-\alpha)\left(\frac{K}{L_H+L_F}\right)^{\alpha}L_H - \gamma_u\frac{\theta_u}{\bar{\theta}}U_F\right)\right],$$

where we used the conditions for factor prices from the main text. Finally, recall that expected foreign labor supply is such that

$$L_F = \varepsilon_s^*\frac{\theta_s}{\bar{\theta}}S_F\Psi_H.$$

[29] Incidentally notice that, while $\overline{\overline{\mu_H}} = \overline{\mu_H}$, $\underline{\underline{\mu_H}} \neq \underline{\mu_H}$ since it depends on $\overline{\Psi}$.

We now proceed as in the two-country model to obtain the following first-order condition:

$$\frac{dW_H}{d\mu_H} = (1-a)\,\gamma_u \frac{U_F}{\bar{\theta}} - \frac{\chi_H\left(\Psi_H,\mu_H\right)\left[a-(1-a)\frac{L_H}{L}\right]}{1+\chi_H\left(\Psi_H,\mu_H\right)\frac{\varepsilon_s^*}{L}} = 0, \tag{20}$$

where

$$\chi_H\left(\Psi_H,\mu_H\right) \equiv (1-\alpha)\,\alpha\left(\frac{K}{L}\right)^{\alpha}\frac{\varepsilon_s^*}{\bar{\theta}} S_F \Psi_H > 0,$$

The second derivative of welfare with respect to μ_H is

$$\frac{d^2W_H}{d\mu_H^2} = -\frac{\frac{d\chi_H}{d\mu_H}\left[a-(1-a)\frac{L_H}{L}\right] + \chi_H \frac{1}{L^2}\frac{dL}{d\mu_H}\left[(1-a)\,L_H + a\chi_H\varepsilon_s^*\right]}{\left[\frac{1}{L}\chi_H\varepsilon_s^*+1\right]^2},$$

where

$$\frac{d\chi_H}{d\mu_H} = -\,(1-\alpha)\,\alpha^2\left(\frac{K}{L}\right)^{\alpha}\frac{\varepsilon_s^*}{\bar{\theta}} S_F\Psi_H \frac{1}{L}\frac{dL}{d\mu_H} > 0$$

and

$$\frac{dL}{d\mu_H} = -\frac{\frac{\varepsilon_s^*}{\bar{\theta}} S_F \Psi_H}{(1-\alpha)\alpha\left(\frac{K}{L}\right)^{\alpha}\frac{1}{L}\frac{\left(\varepsilon_s^*\right)^2}{\bar{\theta}} S_F\Psi_H + 1} < 0.$$

For simplicity, first consider the case in which the global maximum is an interior point for any Ψ_H in $\left[\underline{\Psi},\overline{\Psi}\right]$. Then the locus of points of interior maxima $\tilde{\mu}_H\left(\Psi_H\right)$ is implicitly given by (20). Denote it by $G\left(\tilde{\mu}_H,\Psi_H\right)$. In order to prove our statement we need to show that

$$\frac{d\tilde{\mu}_H}{d\Psi_H} = -\frac{\frac{dG}{d\Psi_H}}{\frac{dG}{d\tilde{\mu}_H}} < 0.$$

First notice that $dG/d\tilde{\mu}_H = d^2W_H/d\tilde{\mu}_H^2 < 0$ as $\tilde{\mu}_H$ is an interior maximum for any Ψ_H. Let us now

analyze $dG/d\Psi_H$. After some algebra we obtain

$$\frac{dG}{d\Psi_H} = -\frac{\frac{d\chi_H}{d\Psi_H}\left[a-(1-a)\frac{L_H}{L}\right]+\chi_H\frac{1}{L^2}\frac{dL}{d\Psi_H}\left[(1-a)L_H+a\chi_H\varepsilon_s^*\right]}{\left[\frac{1}{L}\chi_H\varepsilon_s^*+1\right]^2}<0,$$

since

$$\frac{dL}{d\Psi_H} = \frac{\varepsilon_s^*\frac{\widetilde{\theta}_s}{\bar{\theta}}S_F}{\chi_H\frac{1}{L}\varepsilon_s^*+1}>0$$

and

$$\frac{d\chi_H}{d\Psi_H} = (1-\alpha)\,\alpha\left(\frac{K}{L}\right)^{\alpha}\frac{\varepsilon_s^*}{\bar{\theta}}S_F\left[1-\alpha\frac{1}{L}\Psi_H\frac{dL}{d\Psi_H}\right]>0.$$

Since both $dG/d\tilde{\mu}_H<0$ and $dG/d\Psi_H<0$, then it will be $d\tilde{\mu}_H/d\Psi_H<0$, and hence $\tilde{\mu}_H(\Psi_H)$ is a strictly decreasing function of Ψ_H for any Ψ_H in $\left[\underline{\Psi},\overline{\Psi}\right]$.

Under the weaker assumption that only $\tilde{\mu}_H(\Psi_H=1)=\hat{\mu}_H$ be an interior maximum (see proof of Proposition 2 for a sufficient condition), the reasoning above can be repeated identically in a neighborhood of $\Psi_H=1$. In that neighborhood $\tilde{\mu}_H(\Psi_H)$ is a decreasing function of Ψ_H. The only difference is that now we are not guaranteed that the optimal policy be an interior maximum for any Ψ_H in $\left[\underline{\Psi},\overline{\Psi}\right]$. It may happen that there exist (1) a threshold value $\Psi^o\in(1,\overline{\Psi}]$ above which it is optimal to set an "open door" policy, (2) a threshold value $\Psi^c\in[\underline{\Psi},1)$ below which it is optimal to set a "closed door" policy. The function $\tilde{\mu}_H(\Psi_H)$ will then be weakly decreasing, in the sense of being strictly decreasing in $\Psi_H\in[\Psi^c,\Psi^o]$, and constant in both $[\underline{\Psi},\Psi^c)$ and $(\Psi^o,\overline{\Psi}]$.

Proof of Proposition 4.

We start by finding the three equilibria, then we show that they can be Pareto ranked.

1a. The globally optimal policy equilibrium. We have assumed that, when the policy maker sets up

the globally optimal policy, $\tilde{\mu}_H = \hat{\mu}_H$, then in country H it is $\Psi_H = 1$ and hence $S_F \Psi_H = S_F$ (which is meant to capture the idea that skilled migrants distribute uniformly along the receiving region R). On the other hand, when the government expects $S_F \Psi_H = S_F$, the best policy coincides with the globally optimal policy, $\tilde{\mu}_H = \hat{\mu}_H$ (since the two maximum problems for small open country H and region R would coincide). The point $(\tilde{\mu}_H = \hat{\mu}_H, \Psi_H = 1)$ then satisfies our definition of equilibrium. Given the same policy, the proportion of skilled migrants over natives is $\left(\hat{\theta}_s\left(\hat{\mu}_H\right)/\overline{\theta}\right) S_F/\left(S_H + U_H\right)$ for both country H and region R.[30]

1b,c. High-skill boom and unskilled migration trap. The mechanics of the behavior of skilled foreign workers is such that, when $\mu_H < \hat{\mu}_H$ then $\Psi_H = \overline{\Psi} > 1$, and when $\mu_H > \hat{\mu}_H$ then $\Psi_H = \underline{\Psi} < 1$. On the other hand, the policy maker's best response function $\tilde{\mu}_H(\cdot)$ is a continuous, strictly decreasing function in $\Psi_H \in \left[\underline{\Psi}, \overline{\Psi}\right]$ (as proven in Lemma 3), which takes value $\tilde{\mu}_H(\cdot) = \hat{\mu}_H$ when $\Psi_H = 1$ (as proven above). These elements ensure that, when $\Psi_H = \overline{\Psi} > 1$, then $\exists\ \tilde{\mu}_H\left(\overline{\Psi}\right) \equiv \mu_H^{soft} > \hat{\mu}_H$, and when $\Psi_H = \underline{\Psi} < 1$, then $\exists\ \tilde{\mu}_H\left(\underline{\Psi}\right) \equiv \mu_H^{tight} > \hat{\mu}_H$. The two points $(\mu_H^{tight}, \underline{\Psi})$, $(\mu_H^{soft}, \overline{\Psi})$ satisfy our definition of equilibrium. Under the high-skill boom equilibrium the proportion of skilled migrants over natives is higher for country H than for region R as

$$\frac{\frac{\tilde{\theta}_s\left(\mu_H^{soft}\right)}{\overline{\theta}} S_F \overline{\Psi}}{S_H + U_H} > \frac{\frac{\hat{\theta}_s\left(\hat{\mu}_H\right)}{\overline{\theta}} S_F}{\left(S_H + U_H\right)} \text{ as } \tilde{\theta}_s\left(\mu_H^{soft}\right) > \hat{\theta}_s\left(\hat{\mu}_H\right) \text{ and } \overline{\Psi} > 1.$$

Under the unskilled migration trap the proportion of skilled migrants over natives is lower for country H than for region R as

$$\frac{\frac{\tilde{\theta}_s\left(\mu_H^{tight}\right)}{\overline{\theta}} S_F \underline{\Psi}}{S_H + U_H} < \frac{\frac{\hat{\theta}_s\left(\hat{\mu}_H\right)}{\overline{\theta}} S_F}{\left(S_H + U_H\right)} \text{ as } \tilde{\theta}_s\left(\mu_H^{tight}\right) < \hat{\theta}_s\left(\hat{\mu}_H\right) \text{ and } \underline{\Psi} > 1.$$

[30] Recall that, given our assumptions on countries H,F being zero-measure countries inside regions R, S, both of measure $[0,1]$, then (1) $S_H + U_H$ stand for both the mass of native workers in country H, and the number of native workers for the whole region, R; (2) $S_F + U_F$ stand for both the mass of foreign workers in F and the number of foreign workers in the whole region, S.

2. We now prove that the three equilibria can be ranked in terms of welfare from the lowest - unskilled migration trap - to the highest - the high-skill boom equilibrium. First notice that, under our condition that skilled migrants are beneficial for the receiving economy ($a > \frac{L_H}{L} / \left(\frac{L_H}{L} + 1\right)$, see proof of Proposition 2), aggregate welfare is an increasing function of Ψ_H:

$$\frac{dW_H}{d\Psi_H} = \alpha(1-\alpha)\left(\frac{K}{L}\right)^{\alpha} \frac{\partial L}{\partial \Psi_H}\left[a - (1-a)\frac{L_H}{L}\right] > 0, \tag{21}$$

as $\partial L/\partial \Psi_H > 0$. It is then immediate to prove that welfare under the high-skill boom equilibrium ($W_H\left(\mu_H^{soft}, \overline{\Psi}\right)$) is unambiguously higher than welfare under global optimal policy equilibrium ($W_H\left(\hat{\mu}_H, 1\right)$). In fact, (i) since $\overline{\Psi} > 1$, (21) implies that welfare is higher when $\Psi_H = \overline{\Psi}$ and with the same immigration policy ($W_H\left(\hat{\mu}_H, \overline{\Psi}\right) > W_H\left(\hat{\mu}_H, 1\right)$); (ii) $\hat{\mu}_H$ is, however, a sub-optimal policy when $\Psi_H = \overline{\Psi}$ since, as we have seen above, welfare is maximized when $\tilde{\mu}_H\left(\overline{\Psi}\right) \equiv \mu_H^{soft} > \hat{\mu}_H$ (that is, $W_H\left(\mu_H^{soft}, \overline{\Psi}\right) > W_H\left(\hat{\mu}_H, \overline{\Psi}\right)$). Hence it will be $W_H\left(\mu_H^{soft}, \overline{\Psi}\right) > W_H\left(\hat{\mu}_H, 1\right)$.

Analogously, it is possible to prove that welfare under unskilled migration trap ($W_H\left(\mu_H^{tight}, \underline{\Psi}\right)$) is unambiguously lower than welfare under global optimal policy equilibrium ($W_H\left(\hat{\mu}_H, 1\right)$). In fact, (i) under the same immigration policy μ_H^{tight}, it is $W_H\left(\mu_H^{tight}, \underline{\Psi}\right) < W_H\left(\mu_H^{tight}, 1\right)$ as $\underline{\Psi} < 1$; (ii) μ_H^{tight} is a sub-optimal policy when $\Psi_H = \underline{\Psi}$, and hence $W_H\left(\mu_H^{tight}, 1\right) < W_H\left(\hat{\mu}_H, 1\right)$. We then conclude that $W_H\left(\mu_H^{tight}, \underline{\Psi}\right) < W_H\left(\hat{\mu}_H, 1\right)$. Finally, notice that condition (21) holds for $a \geq 1/2$ (that is, also when $a = 1/2$ -i.e. when political weights on capitalists and workers in the objective function of the government are identical). This implies that the above proof is valid for both government welfare and social welfare in H.

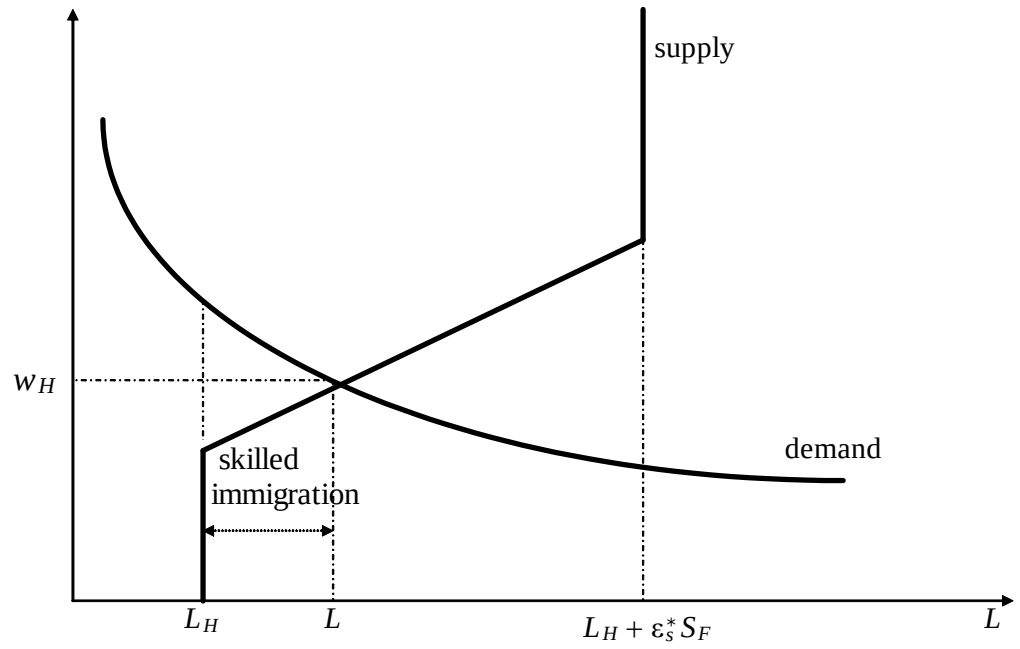

Figure 1: The equilibrium in the labor market.

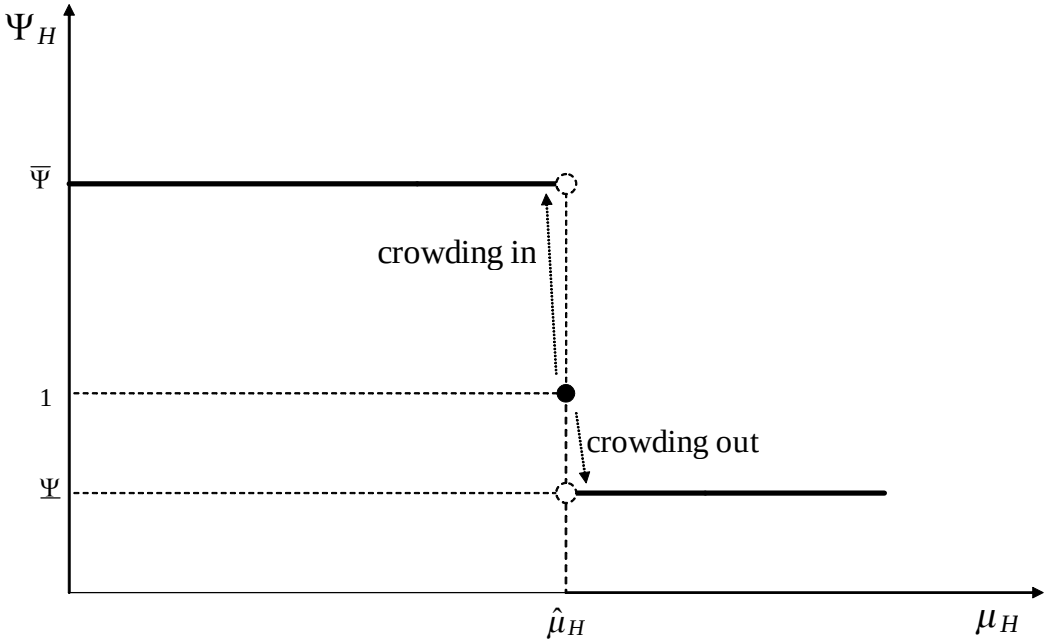

Figure 2: Crowding in and crowding out of skilled immigrants as a function of immigration policy.

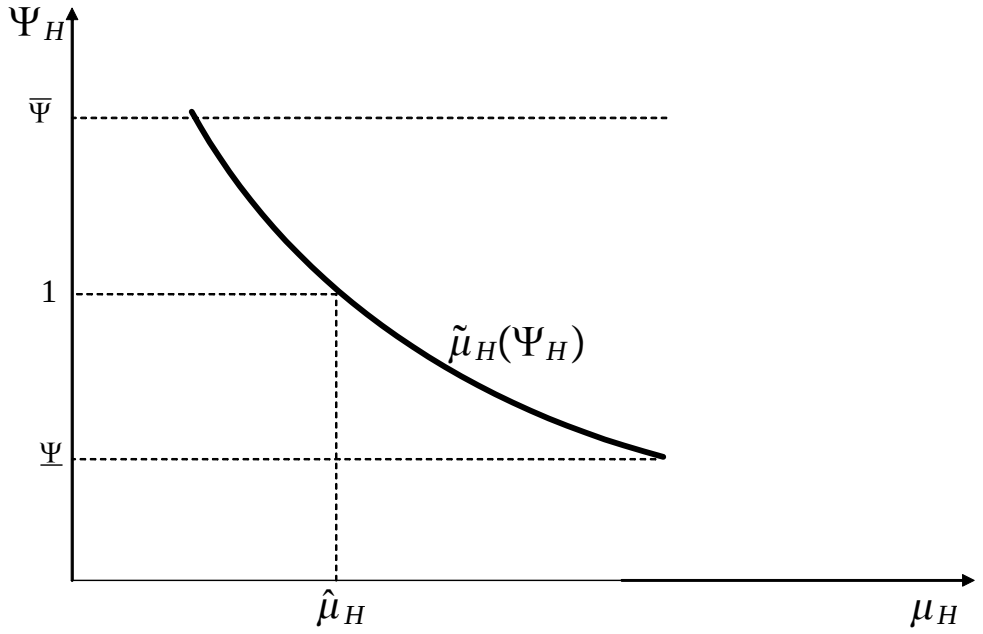

Figure 3: The politically optimal immigration policy in country H as function of Ψ_H.

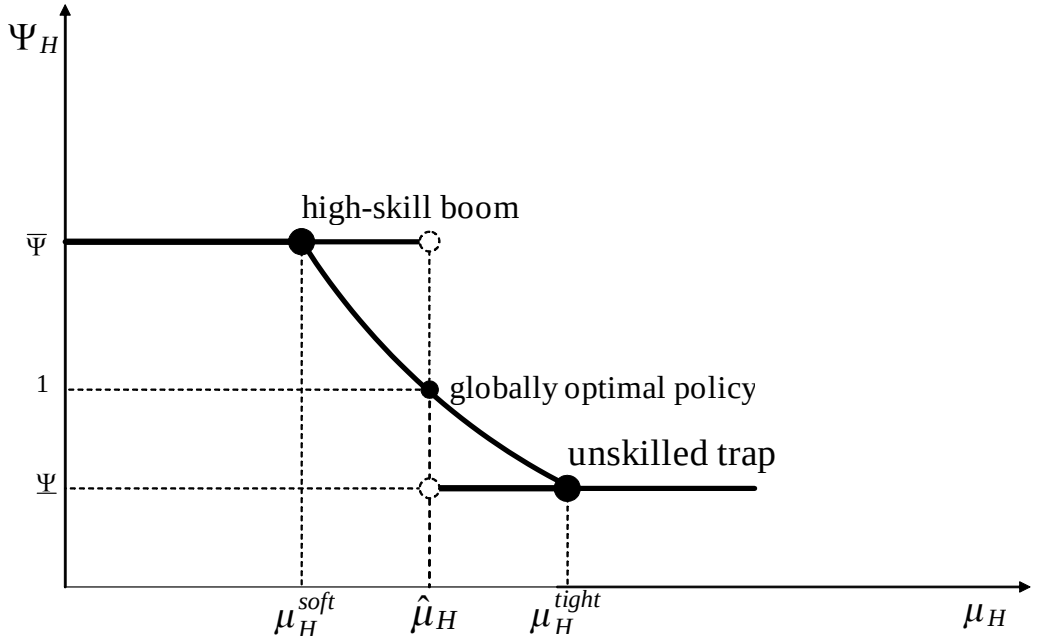

Figure 4: The three policy equilibria.

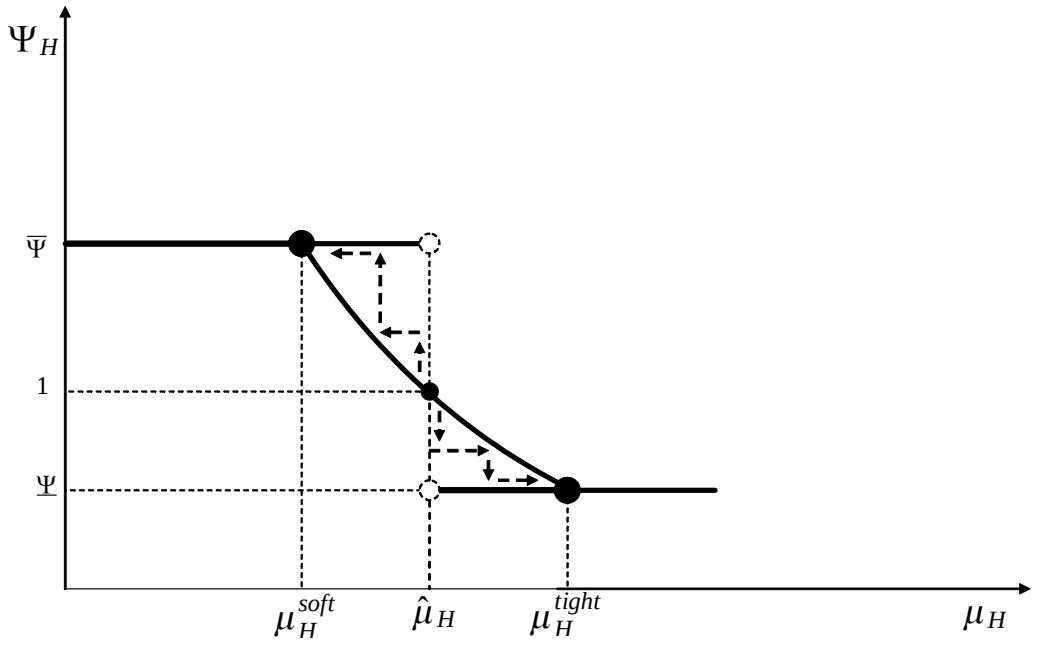

Figure 5: Stability and instability of the three policy equilibria.