Immigration Policy and Self Selecting Migrants

Milo Bianchi*
Dept. of Economics

Stockholm School of Economics
May 2005
[PRELIMINARY - COMMENTS MOST WELCOME]

Abstract
We develop a simple model of international labor migration where size and skill composition of the migration flow are jointly determined by migrants self selection and immigration policy. The migration decision is driven by economic incentives (differential returns to skills) and it is constrained by wealth (to cover the migration cost). Influencing this cost, immigration policy acts on both components. In the receiving country immigrants affect wages and this shapes natives preferences. Different groups of natives typically have conflicting preferences and these translate in a more or less restrictive policy according to their political influence. We find that the migration decision may display very different characteristics depending on its main driving force (incentives or constraints) and that, considering the effect of policy on the skill composition of immigrants, we might observe low skilled natives supporting an open doors policy. Finally, we show how equilibrium policy may impose inefficiently high cost of migration.

Keywords: International migration; migrant self-selection; immigration policy preferences, political economy, discrimination.
JEL codes: J61, F22, O24, D78, J71

Acknowledgement: I thank Jörgen Weibull and Guido Friebel for helpful comments and precious encouragement, seminar participants at the Stockholm School of Economics for useful discussion and the Jan Wallander and Tom Hedelius Foundation for financial support.

Stockholm School of Economics, P.O. Box 6501, SE-113 83 Stockholm, Sweden

*milo.bianchi@hhs.se
1 Introduction

Who are the migrants? What are the forces driving the decision to migrate? What is the effect of host country policies on this decision? What determines immigration policies?

These questions have accompanied many academic and policy debates since a long time. Nonetheless, these same questions are still burning and controversial. The fact is not surprising. International migration is a phenomenon of growing importance, both for its size and for the concerns publicly attached to it. Moreover, the topic is naturally complex and a diverse set of considerations (economic, social, cultural...) usually enters the discussion. This renders heroic the task of reaching a consensus. What is clear is that these questions are different sides of the same object, and that our understanding would be probably improved by considering them in a unified approach, where the interaction between demand and supply forces is explicitly analyzed.

The paper tries to develop a simple framework along these lines. Approaching the issue with the lens of economic theory, we recognize that potential migrants are not a random sample of the sending country population. Rather, they are rational agents, who (optimally) react to incentives and constraints and who are then crucially influenced by receiving country policies. These too are set optimally, in order to regulate the size but also to influence the skill composition of the immigration flow. Policies are then a response to immigrants behavior, as resulting from natives’ preferences and the political institutions that map these preferences into political outcomes.

In our model, the migration decision is driven by incentives and wealth constraints. The first term has been the traditional focus of the literature on self selection: high skilled work in the country where returns to skills (i.e. wage differentials) are higher. The second is, to my knowledge, pretty unexplored and points out that migration is a costly investment and, given credit market imperfections, one has to be sufficiently wealthy to be able to afford it. Since wealth and skill tend to be positively correlated, this constraint is an important determinant of immigrant average skill. We analyze how these forces shape the population of (potential) immigrants, highlighting that they may push the self selection process in opposing directions and thus qualifying existing results.

Our major concern, however, is how these forces are influenced by immigration policy, that enters the picture influencing migration costs, i.e. imposing direct admission fees, bureaucracies and other time consuming procedures in order to make it easier or harder to enter and get a job in the new country. Given our explicit formalization of the migration decision, we show how different policies are a major determinant not only of size but also of average skill composition ("quality") of immigration flows. Thus citizens in the receiving country (natives) typically have conflicting interests over different levels of cost, given its influence on the skill ratio and thus ultimately on equilibrium wages. Here we find that it is not always the case that high skilled natives push for decreasing migration cost (i.e. they have "pro immigration" attitudes) and low skilled push for the opposite. Quite surprisingly, if the source country is relatively rich and have high returns to skills,
the traditional relation between natives skills and preferences towards immigration might be reversed.

Finally, the way policy is determined reflects the interaction between natives’ preferences, that are formed purely on economic considerations, and political institutions that "aggregate" these preferences. The government set its policy trading off costs and benefits assigned to different groups of natives, considering efficiency and/or political convenience. In some cases, historically most plausible, the latter pushes for imposing inefficiently high cost of migration.

The rest of the paper will be as follows. Section 2 will present the basic structure of the model and the main assumptions. Section 3 will solve the model, highlighting its logic and results in comparison with other approaches and some empirical evidence. Section 4 will discuss further some critical points emerged in the analysis and propose a relevant extension. Section 5 will conclude pointing out some limitations of the paper. Before that, however, we briefly relate the present work to the existing literature.

1.1 Related literature

The present model lies in the interaction between three streams of literature: the one on immigrants self selection, the one on immigration preferences and the one on policy formation. On self selection the famous article by Borjas (1987) is based on the Roy’s model, where the role of return to skills (transferability and wage inequality) is emphasized and migration costs play no role in the selection process. Chiswick (1999) approaches the issue with a standard human capital model, where the rate of return to immigration depends both on costs and different returns to skills, but no wealth constraints are introduced\(^1\). Moreover, this strand of literature considers only the supply side, without accounting for the role of immigration policies.

Regarding the demand side, some steps have been made since Borjas (1994) statement that "the literature does not yet provide a systematic analysis of the factors that generate the host country’s demand function". Recently, the determinants of individual preferences towards immigration have been investigated and many authors have recognized that these can be explained fairly well by economic factors, in particular with the standard factor-proportions-analysis, where immigrants are assumed to compete in the labor market with similarly skilled natives (as documented in Scheve and Slaughter (2001), Mayda (2004), O’Rourke and Sinnott (2004)). We also build on this model, but we keep the quality of immigrants endogenous (i.e. we do not assume that the proportion of low skilled immigrants is fixed and independent on policies).

\(^1\)Hatton and Williamson (2004) state: "When dealing with selection, the immigration literature tends to stress income incentive [...] But changes in selection can be best explained by changes in the costs of the move and the capital constraints on it". These constraints play a leading role in the theory of illegal migration in Friebel and Guriev (2004), that has however a pretty different focus than our one.
On the determinant of policies then, one standard approach has been to focus on the immigration surplus (e.g. Borjas (1995)), implicitly assuming that immigration policies are determined solely on efficiency considerations. However, it is clear that the mapping from preferences to policy depends also on political and institutional factors, thus it is important to consider political economy issues. Recently Benhabib (1996) has explored how the median voter determines minimal capital requirements for admission, while Epstein and Nitzan (2005) and Facchini and Willman (2005) use a lobbying model to explain the formation of immigration quotas. While we do not develop a new political economy model, our approach can be novel in this literature since we fully determine individual preferences within the model and we concentrate in migration cost as a policy variable.

2 The model

We study international labor migration in a world with two countries, a receiving and a sending one. People born in the first country are called natives, the others are called foreigners, and each variable in the sending country is denoted with the superscript *. Countries are populated by a continuum of workers of two types $H; L$; with total mass $n = n_H + n_L$ and $n^* = n_H^* + n_L^*$.  

Assumption 1: $\frac{n_H^*}{n_L^*} \leq \frac{n_H}{n_L}$.  

The assumption says that foreigners’ skill ratio does not exceed natives’ one, thus the model describes migration from poor to rich countries (or South to North).

Foreigners decide whether to migrate maximizing their (indirect) utility, that is linear in wages and costs of migration. Thus a foreigner $i$ of type $\theta$ enjoys

$$V_{i\theta} = \begin{cases} w_{i\theta}^* & \text{if he stays} \\ w_{i\theta} - (\gamma + \varepsilon_i) & \text{if he migrates} \end{cases}$$

where $w_{i\theta}^*$ and $w_{i\theta}$ are wages earned by a worker of type $\theta$, respectively, in the sending and in the receiving country. The former are exogenously given, while the latter are determined within the model (see below); and we denote $w_{i\theta}^* = w_{iL}^* + \Delta w^*$ and $w_{i\theta} = w_{iL} + \Delta w$ with $\Delta w^*, \Delta w \geq 0$. The cost of migrating, $(\gamma + \varepsilon_i)$, includes a common term $\gamma$ (i.e. any out-of-pocket and relocating cost) and an individual specific "taste for migration" $\varepsilon_i$, that is a random variable with density $\varphi$ and cumulative distribution $\Phi$ satisfying the following:

Assumption 2: The ratio $\frac{\varphi}{\Phi}$ is nondecreasing.

This is innocuous, as it can be easily shown that the assumption is satisfied for a large class of probability distributions (e.g. Normal, Gumbell, Logistic, ChiSquare, Exponent-
tial, Weibull). Anyway this individual component, being independent on type, does not drive any of the results.

We also make the following:

**Assumption 3:** \( \gamma \leq \min \{ w_L - w^*_L; w_H - w^*_H \} \).

This assumption involves restrictions on endogenous variables, thus it might be problematic. It says that, irrespective on how the model changes our variables, we are always in a situation where gains from migration are on average positive for both groups of foreigners. However, beside simplifying the analysis, this parameter constellation is the most interesting to discuss. In fact the central point of our analysis comes from considering how policies affect quality, and this is a meaningful exercise if, on average, both types are willing to migrate, that is what assumption 4 requires. Anyway, the analysis for the other cases is similar.

Since migration is costly, and the sending country has no credit market, only sufficiently wealthy people can afford it. Let wealth (conditional on type \( \theta \)) be distributed according to the density \( \psi_\theta \) and cumulative distribution \( \Psi_\theta \) and thus let \( [1 - \Psi_\theta(\gamma)] \) be the fraction of type \( \theta \) foreigners that can incur the monetary cost of migration.

**Assumption 4:** \( \Psi_H(\gamma) < \Psi_L(\gamma) \) for every \( \gamma \).

This seems pretty natural as well. It says that high skilled are on average more wealthy than low skilled (evidence of this correlation, that is particularly strong in developing countries, can be found for example in Piketty (2000)).

In order to analyze how immigration policy are formed, we have to specify the impact of immigrants on the host country economy, that are the only determinant of natives’ immigration preferences, which are in turn translated into policy by the government.

The receiving country economy is modeled in the most standard way. We have competitive …rms that maximize pro…ts employing both high and low skilled workers, a neoclassical production function with constant returns to scale and a competitive labor market where (completely inelastic) supply equals demand. Define the receiving country

---

3We could not find a counterexample in the family of parametric distributions, but it is clear that one can build up some ad-hoc one. Let \( \Phi(y) = \begin{cases} (y - 1)^3 + \frac{1}{2} & \text{if } y \in (1 - \frac{3}{2}, 1 + \frac{3}{2}) \\ 0 & \text{otherwise} \end{cases} \). Now \( \varphi(y) \) is bimodal and \( \varphi(y) \) is decreasing for \( y \in (1, 1 + \sqrt{\frac{3}{2}}) \). So it is theoretically possible to violate assumption 2, but we do not think this represents a major limitation of our model.

4It also seems the most relevant one: \( w_y - w^*_y \) is the life-time gain from immigration, that is likely to be greater than the monetary costs of migration.

5In light of this assumption, the fact that we do not consider the possibility to borrow money in order to migrate is pretty innocuous. In fact, even if an (imperfect) credit market was opened, wealthy people would be able to borrow more or at a lower cost than the poor ones, that is what we need. Obviously if one assumed a perfect world wealth constraints would become irrelevant.

6Think of a small open economy with perfectly mobile capital (that we are not going to consider explicitly in the production function).
production technology $Y = F(N_H, N_L)$, where $N_H$ and $N_L$ are the total amount of high and low skilled workforce, and let $F_\theta := \frac{\partial F(N_H, N_L)}{\partial N_{\theta}}$. In sum we require:

**Assumption 5:** $w_\theta = F_\theta; F_{HH}, F_{LL} < 0$ and $F_{HL} > 0$.

Equilibrium wages are the only thing that natives care about. And their marginal productivity is determined by the distribution of skills and thus possibly by the flow of foreign workforce. Thus they form preferences on immigration according to the impact of immigrants on the skill ratio $R := \frac{N_H}{N_L}$. Specifically, let natives derive utility according to the (indirect) function $U_\theta = w_\theta$.

In order to regulate immigration flows, the government in the receiving country acts on the monetary cost $\gamma$. The government takes into account the preferences of both groups of natives and it chooses the optimal policy in order to maximize the weighted welfare function

$$W(\gamma) := \mu_H w_H(\gamma) + \mu_L w_L(\gamma)$$

where $\mu_\theta$ denotes the weight attached to group $\theta$’s utility. Thus it solves the following program:

$$\max_{\gamma \in \mathbb{R}_+} W(\gamma)$$  \hspace{1cm} (1)

### 3 Analysis

#### 3.1 The migration decision

A foreigner $i$ of type $\theta$ prefers migration iff $w_\theta - (\gamma + \varepsilon_i) \geq w_\theta^*$ and for each type $\theta$ there exists a cut-off value $\varepsilon^\theta \equiv w_\theta - w_\theta^* - \gamma$ such that each individual $i$ of type $\theta$ with $\varepsilon_i < \varepsilon^\theta$ would like to migrate. In addition, this individual must be sufficiently wealthy to incur the migration cost $\gamma$.

Thus, the supply of migrants of type $\theta$ is:

$$x_\theta^* = [1 - \Psi_\theta(\gamma)] \Phi[w_\theta - w_\theta^* - \gamma] n_\theta^*.$$  \hspace{1cm} (2)

That is, the actual number of type $\theta$ immigrants is determined by economic incentives (the fraction $\Phi[w_\theta - w_\theta^* - \gamma]$ representing those who are willing to move), wealth constraints (the fraction $[1 - \Psi_\theta(\gamma)]$ who can afford to move) and the amount $n_\theta^*$ of type $\theta$ foreigners.

---

7We are assuming that the impact of immigrants on the labor market is described by our standard model. This is pretty controversial: empirical studies (see the reviews in Borjas (1994) and Friedberg and Hunt (1995)) found mixed and generally weak impact of immigrants on natives’ wages. One of the most recent contribution on this literature is Borjas (2003), in which he forcefully claims that the labor demand is indeed downward sloping. What we need, however, is not that this effect is real, but that is perceived so by citizens. And the centrality of this issue in past and current policy debates seems unquestionable.

8We are assuming that individual preferences are well approximated by economic interests, abstracting from other concerns (crime, ideology, culture...). Later, the evidence in support to it will be discussed.
Most of the following results depend on the average skill ratio of immigrants (that we often call "quality"), implicitly defined by

\[ Q := \frac{x_H^*}{x_L^*} = \frac{[1 - \Psi_H(\gamma)]}{[1 - \Psi_L(\gamma)]} \cdot \frac{\Phi[(w_L - w_L^*) + (\Delta w - \Delta w^*) - \gamma]}{\Phi[w_L - w_L^* - \gamma]} \cdot \frac{n_H}{n_L} \]

Our characterization of the forces that shape the individual decision to emigrate is very simple and of course cannot be considered as the complete story. However we already have enough ingredients to address some fundamental relations and to relate them to the results in the current literature.

### 3.1.1 Positive or Negative Self-Selection

In our setting, we talk about positive or negative self-selection when the population of migrants is not a random sample of the population in the sending country, but those who decide to migrate are on average more or less skilled than those who remain at home.

The traditional wisdom has long been that immigrants are positively self-selected: only the "best" have the motivation to pack up and try their fortune in a foreign country, and this explains the cross section finding that immigrants outperform natives in the long run (see Borjas (1994) for a discussion). This wisdom has been challenged by the formal literature emphasizing the centrality of incentives (mentioned above). Our model enriches this picture recognizing that the selection process is driven also by wealth constraints. These are less severe for the high skilled, thus pushing towards positive self selection \( \left( \frac{1}{1 - \Psi_H(\gamma)} > 1 \right) \). Incentives to migrate, instead, are higher for high skilled relative to low skilled if the return to skills is higher in the receiving than in the sending country:

\[ \frac{\Phi[(w_L - w_L^*) + (\Delta w - \Delta w^*) - \gamma]}{\Phi[w_L - w_L^* - \gamma]} \geq 1 \iff \Delta w \geq \Delta w^* \]

In this case we can clearly conclude that immigrants are positively self-selected.

If \( \Delta w < \Delta w^* \) however, the total effect is ambiguous and it depends on the relative strength of the two forces, i.e. whether the migration decision is driven more from wealth constraints (likely for poor source countries) or incentives (likely for relatively rich source countries).

**Proposition 1** If \( \Delta w \geq \Delta w^* \) immigrants are positively self-selected, while if \( \Delta w < \Delta w^* \) the effect is ambiguous.

---

9 Other interesting approaches challenging this view can be found in Katz and Stark (1987) on asymmetric information on immigrants productivity and the possible occurrence of lemon market effects or in Stark and Taylor (1991) where immigration is driven by poor performance relative to some reference group. In these models the "worst" are those who leave.
What is clear is that, due to the wealth effect, higher migration costs push towards a more positive (or less negative) self selection. This matches the evidence reported in Hatton and Williamson (2004), where the gap in years of schooling between movers and stayers in 1990s is positive (thus supporting the view that immigrants are positively self selected), but it is smaller the closer source and destination countries are\(^\text{10}\). Moreover it is consistent with some recent findings on the Mexico-US migration. Chiquiar and Hanson (2005) report that Mexican immigrants are positively self selected and, since returns to skills are supposed to be higher in Mexico, this contradicts the standard Borjas (1987) model. The results, however, can be well interpreted recognizing the interaction between costs of migration and returns to skills in shaping the self selection process.

\subsection*{3.1.2 Comparative statics}

We are now interested in describing how migration size and quality depend on migration costs and economic conditions in the source country. The model in Borjas (1987) emphasizes the role of migration incentives and here higher source inequality (being a proxy for higher returns to skills) is associated with lower quality of immigrants. Chiswick (1999) takes into account also the role of costs, and in his model higher costs and higher inequality increase the quality of immigrants.

Our model qualifies these results, emphasizing how they depend on whether migration is driven by wealth constraints or incentives and how things might get more complicated once these two determinants are considered together.

Effect of cost  Obviously cost and size of migration are negatively correlated. The effect on quality is more interesting and to see it, denote (abusing a bit) \(L = w_L - w^*_L - \gamma\) and \(H = w_H - w^*_H - \gamma\). Then \(\frac{\partial Q}{\partial \gamma} \geq 0 \iff\)

\[
\Phi(H)\Phi(L)\left\{\psi_L(\gamma)[1 - \Psi_H(\gamma)] - \psi_H(\gamma)[1 - \Psi_L(\gamma)]\right\} + \\
\left\{1 - \Psi_H(\gamma)[1 - \Psi_L(\gamma)]\right\}\left[\varphi(L)\Phi(H) - \varphi(H)\Phi(L)\right] \geq 0
\]

\(\text{+ iff } H > L\)

It can be shown that the first term is always positive (wealth effect: increasing the cost you’ll get only rich and skilled immigrants) while the second term is positive iff \(H > L\) (incentive effect: the relative effect of a changing in cost is higher for people with lower gain from emigration, thus if \(H > L\) an increase in costs have stronger deterrence on \(L\) than on \(H\), thus the quality increases). Thus, as a first approximation, the total effect is unambiguous (and positive) only if \(H > L\) (i.e. \(\Delta w \geq \Delta w^*\)).

\(^{10}\)They report a gap of 1.2 years for Mexico (close to the US), 4.8 years for the Eastern Europe and the Balkans (close to the EU), 8.6 years for Asia and 10.8 years for Africa.
Proposition 2 If $\Delta w \geq \Delta w^*$ an increase in migration cost increases immigrant quality, while if $\Delta w < \Delta w^*$ the effect is ambiguous.

Effect of wealth and wages When the source country becomes more wealthy, more people are able to incur the migration cost, thus we should expect migration to increase. On the other hand, this is often associated with an increase of wages at home, that reduces the incentives to migrate and thus the migration flow. This can explain the fact that immigration increased as source countries started to grow (relaxing wealth constraints) and then decreased (incentive effect), as reported e.g. in Hatton and Williamson (2004) and, using more recent data, in Rotte and Vogler (2000). The pattern is also consistent with the panel analysis in Mayda (2005).

The effects on quality are similar to those analyzed at the previous point. An increase in the average wealth in the source country decreases the quality (since now more poor and low skilled people afford to move), while an increase in the level of wages $w_L^*$ increases $Q$ iff $\Delta w \geq \Delta w^*$ (since as before $\frac{\partial Q}{\partial w_L^*} > 0 \iff \varphi(L)\Phi(H) - \varphi(H)\Phi(L) > 0$).

Finally, the effect of source country inequality is ambiguous. More wealth inequality (i.e. the lower is $\Psi_H(\gamma)$ with respect to $\Psi_L(\gamma)$) increases $Q$, while more wage inequality (i.e. higher $\Delta w^*$) decreases $Q$. Once again, since wealth and wage distributions tend to be highly correlated, the total effect on $Q$ depends on whether wealth constraints or incentives are the major determinant of the migration decision.

Proposition 3 When wealth constraints are the main determinant of migration supply, the flow increases and quality decreases as the source country gets richer and more equal. When migration is driven mostly by incentives the effects are the opposite if $\Delta w < \Delta w^*$.

3.2 Natives’ preferences

The ratio of high to low skilled workers in the receiving country depends on migration flows according to the following expression:

$$R = \frac{n_H + x_H^*}{n_L + x_L^*} = \frac{n_H + [1 - \Psi_H(\gamma)]\Phi[(w_L - w_L^*) + (\Delta w - \Delta w^*) - \gamma]n_H^*}{n_L + [1 - \Psi_L(\gamma)]\Phi[w_L - w_L^* - \gamma]n_L^*}$$

Now $w_L$ (respectively $w_H$) depends positively (respectively negatively) on $R$ so preferences of different groups can be reduced to preferences over $R$, which is affected by the size and the skills composition of the foreign workforce.

Immigration policies can influence $R$ (and thus wages), and here we focus on the effects of a change in migration cost $\gamma$. This cost has surely exogenous components (like the distance between the two countries and, partly, transportation costs or the existence of an established network of previous migrants...). We argue, however, that policies in the receiving country can have a significant influence on it, acting on the costs to be incurred
for admission (e.g. direct fees, bureaucracies, waiting time before getting a working permit or a job in the new country...)\textsuperscript{11}. And policy makers seem well aware of this. Historically, the first interventions made to limit immigration flows in the US and Canada (before the 30s) was not the introduction of quotas, but an increase in costs (removal of monetary incentives, introduction of costly procedure or head taxes for admission)\textsuperscript{12}.

In order to analyze, within our model, which group of natives pushes for a certain policy reform we have to consider how the skills ratio $R$ responds to such a change in costs. The relation is not obvious ex-ante, since the reform impacts not only the size but also the quality of immigration. Reducing the costs, e.g., it of course increases the size. The change in quality, however, has to be analyzed more carefully, separating wealth and incentive effects.

\subsection{3.2.1 Wealth effect}

Consider first the pure wealth effect. We have seen in the previous section that a reduction in costs allows more poor and unskilled people to migrate and thus reduces the quality of immigrants. To see how this impacts $R$, let $\varepsilon_i$ have zero mean and infinitely small standard deviation ($\Phi$ tends to a unit step function), so the incentive effect is not at work for marginal changes in $\gamma$.

Now

$$R = \frac{n_H + [1 - \Psi_H(\gamma)]n^*_H}{n_L + [1 - \Psi_L(\gamma)]n^*_L}$$

and $\frac{\partial R}{\partial \gamma} \geq 0 \iff$

$$\psi_L(\gamma)n^*_L n_H - \psi_H(\gamma)n_L n^*_H + n^*_L n^*_H[\psi_L(\gamma)(1 - \Psi_H(\gamma)) - \psi_H(\gamma)(1 - \Psi_L(\gamma))] \geq 0$$

\textsuperscript{11}This cost can also be thought as a consequence of uncertainty. We do not want to introduce this in the model, but notice that we can interpret the set of people that are sufficiently wealthy as those who have sufficiently low risk aversion. The relation between skills and risk aversion however is less clear, but can also be thought as positive (less risk averse people invest more in human capital). So the model may apply.

\textsuperscript{12}Timmer and Williamson (1998) report that the United States, for example, introduced a head tax of 50 cents per migrant in 1882, that was progressively raised to $8 in 1917. Also, in 1907 they introduced the first financial test, establishing that each individual must have $25 (or $50 per family). The same acts extended the classes of "excludable" immigrants, i.e. those who were prohibited to entry because they would have surely become a burden for the hosting society. Passenger acts in the US in the 19th century (fixing minimal standards to carry immigrants) is another policy that indirectly increased migration costs. Canada has also acted on costs in order to control the composition of the immigrant population. In 1870, a travel fund of C$ 30 per adult (for Mennonites that agreed to build settlements) was introduced, while in 1910 migration was restricted by a tax of C$ 50 per head (C$ 200 per head for Asians).
In the worst case, i.e. when $n_L n_H = n_L n_H = n_L n_H$, our condition becomes

$$\frac{\partial R}{\partial \gamma} \geq 0 \Leftrightarrow \frac{\psi_L(\gamma)}{2 - \Psi_L(\gamma)} \geq \frac{\psi_H(\gamma)}{2 - \Psi_H(\gamma)}$$

and this holds for any $\gamma < \gamma^*$, where $\psi_L(\gamma^*) < \psi_H(\gamma^*)$.

What we argue is that in general if $\gamma > \gamma^*$, i.e. wealth is very low, the assumption $n_L n_H = n_L n_H$ does not make sense but we have $n_L n_H >> n_L n_H$ (very poor countries have very poor educational system and so it’s not reasonable to assume that they have the same skills ratio of destination countries). Thus condition (5) is likely to be "always" satisfied.

To see to what extent this somewhat loose argument seems reasonable consider the following example. Let wealth conditional on skills be distributed according to a Weibull with parameters $(0, k, 2)$. These are chosen in order to give the distribution support on $[0, \infty)$, mean approximately equal to $k$ and a shape that resembles a lognormal. However what matters is that, in the sending country, skilled workers are on average $k$-times richer than low skilled, with $k \geq 1$. Thus let $\psi_H = Weib(0, k, 2)$ and $\psi_L = Weib(0, 1, 2)$, as shown in figure.

Distributions of wealth conditional on skills in the sending country. Skilled workers are on average $k$-times richer than low skilled. Weib(0,k,2) for k=1, 1.1, 2 and 4.

Condition (6) becomes:

$$k^2 + (k^2 - 1)e^{-\frac{x^2}{k^2}} - e^{-\frac{(k^2-1)x^2}{k^2}} > 0$$

We cannot solve it analytically but if e.g.
$k = 1.1$, we need $\gamma < \gamma^* = 1.18$, where $\Psi_L(\gamma^*) = 0.75$
$k = 2$, we need $\gamma < \gamma^* = 1.52$, where $\Psi_L(\gamma^*) = 0.9$
$k = 4$, we need $\gamma < \gamma^* = 1.88$, where $\Psi_L(\gamma^*) = 0.97$

Thus if e.g. high skilled foreigners are on average twice as wealthy than low skilled, we require that the probability that a low skilled cannot afford the migration cost does not exceed 90%. This seems a mild requirement for a source country that is sufficiently wealthy to have the same skills distribution of a receiving country ($\frac{n_H}{n_L} = \frac{n_H}{n_L}$). Notice also that the requirement gets milder the greater is wealth inequality conditional on skills.

### 3.2.2 Incentive effect

Now consider a particularly wealthy source country (or equivalently a particularly low, maybe negative\(^\text{13}\), cost of moving), so that almost everybody can afford migration. Now only incentives matter and

$$R = \frac{n_H + \Phi[(w_L - w_L^*) + (\Delta w - \Delta w^*) - \gamma]n_H^*}{n_L + \Phi[w_L - w_L^* - \gamma]n_L^*}$$

Denote (abusing again a bit) $L = w_L - w_L^* - \gamma$ and $H = w_H - w_H^* - \gamma$. Thus

$$\frac{\partial R}{\partial \gamma} \geq 0 \iff n_L^*n_H\varphi(L) - n_Ln_H^*\varphi(H) + n_H^*n_H^*\varphi(L)\Phi(H) - \varphi(H)\Phi(L) \geq 0 \quad (7)$$

Condition (7) holds e.g. when $\Delta w > \Delta w^*$ and $\varphi(L) > \varphi(H)^\text{14}$, but this is not really needed. To see what is necessary, consider the following special case: $\varepsilon_i \sim U(-\frac{1}{2\varepsilon}, \frac{1}{2\varepsilon})$.

Condition (7) becomes:

$$n_L^*n_H - n_Ln_H^* + n_H^*n_H^*\varepsilon[\Delta w - \Delta w^*] \geq 0$$

that holds as long as

$$\Delta w^* - \Delta w \leq \frac{n_L^*n_H - n_Ln_H^*}{n_L^*n_H^*\varepsilon} = \frac{1}{\varepsilon} \left(\frac{n_H}{n_H^*} - \frac{n_L^*}{n_L^*}\right)$$

Notice that the right-hand-side of the last equation is always positive (and increases with the dispersion of the "taste for migration" parameter). Thus the condition holds for sure if $\Delta w^* \leq \Delta w$ but also if $\Delta w^* > \Delta w$ and the skills distribution in the source country is sufficiently worse than the one in the receiving country.

\(^{13}\)As we have already noted, subsidies to promote immigration are not uncommon in the history.

\(^{14}\)Let for example $\varepsilon_i$ be distributed according to a Normal with zero mean.
3.2.3 Both effects

If $\Delta w^* - \Delta w < \frac{1}{\epsilon} \left( \frac{w_H}{n_H} - \frac{w_L}{n_L} \right)$ (and in particular if $\Delta w \geq \Delta w^*$), there is no ambiguity since they have the same direction. Thus $\frac{\partial R}{\partial \gamma} > 0$.

If $\Delta w^* - \Delta w > \frac{1}{\epsilon} \left( \frac{w_H}{n_H} - \frac{w_L}{n_L} \right)$ then the total effect depends of course on strength of the two components: the wealth effect has more power the greater is the difference in average wealth between skilled and unskilled foreigners; the incentive effect has more power the greater dispersion in tastes we have (the higher the variance of $\tilde{z}_i$). More fundamentally, self selection into migration from poor source countries is likely to be driven by wealth constraints, the one from rich countries by incentives. In the latter case, moreover, skill distribution of receiving and sending countries may get similar, thus differential returns to skills become really crucial.

In sum:

**Proposition 4** When wealth constraints are the main determinant of migration supply, high skilled natives support (and low skilled oppose) a reduction in costs of immigration. When only incentive matters the same occurs only if returns to skills in the sending country are not "too high".

3.3 Equilibrium Policies

The simple observations in the last section have emphasized how immigration policy is in general a source of conflicts within the society. The important question is now how these conflicts are resolved in the political arena, or under which conditions one group or another is satisfied. To address this, we turn to the government’s program.

Consider for simplicity a Cobb-Douglas production function $F(N_H, N_L) = N_H^{\alpha} N_L^{1-\alpha}$ and remember $R = \frac{N_H}{N_L} = \frac{n_H + x_H}{n_L + x_L}$. Then equation (1) becomes:

$$\max_{\gamma \in \mathbb{R}^+} W(\gamma) = \mu_H \alpha R^{\alpha - 1} + \mu_L (1 - \alpha) R^\alpha$$

and

$$\frac{dW}{d\gamma} = \frac{\partial R}{\partial \gamma} \left[ \mu_L R - \mu_H \right]$$

3.3.1 Benthamite government

Let the government value the utility of each group according to their size (i.e. $\mu = n$). Thus $W = n_H w_H + n_L w_L$ (plotted in figure)
The objective function of a Benthamite government: \[ W = n_H w_H + n_L w_L \] with \( n_H = n_L = 10 \) and \( \alpha = 0.6 \) and

\[
\frac{dW}{d\gamma} = \frac{\partial R}{\partial \gamma} \left[ \frac{n_L x_H^* - n_H x_L^*}{n_L + x_L^*} \right]
\]

Notice that the function \( W \) has a minimum at \( R = \frac{n_H}{n_L} \), i.e. when \( \frac{x_H^*}{x_L^*} = \frac{n_H}{n_L} \). Thus economic benefits from immigration are minimized when immigrants replicate, in terms of skills, the native population. The government acts on costs in order to admit immigrants that complements natives and so maximize or minimize the skill ratio. If we keep the quality fixed (i.e. consider only the size effect and ignore the effect of costs on quality), then we have that \( \frac{\partial R}{\partial \gamma} > 0 \iff \frac{x_H^*}{x_L^*} < \frac{n_H}{n_L} \) and so \( \frac{dW}{d\gamma} < 0 \). Thus welfare is maximized when migration costs are zero.

So, given immigrant quality, absent special interests politics (and distributive concerns), the government imposes no restrictions on immigration. This comes from the fact that the receiving country increases its benefits from immigration the more immigrants skills differ from natives.\(^{15}\)

In our setting, with endogenous quality, things are more complicated. The government would like to act on costs and admit only high skilled or only low skilled immigrants, in order to complement natives skills (if natives are mostly skilled the marginal benefit of an additional immigrant are higher if the immigrant is unskilled and vice versa), but as we have seen we are not always able to sign \( \frac{\partial R}{\partial \gamma} \).

\(^{15}\)The result resembles a well known principle in international trade, where gains from trade are higher the greater the trading countries differ in their factor endowments. A similar point, in a more complicated setting, is made by Borjas (1995).
However we can consider some important special cases. The standard one is when immigrants are positively self-selected (migration is driven by wealth constraints and/or returns to skills are higher in the receiving country) but still they tend to have lower skills than natives (as documented e.g. in Borjas (1995), Hatton and Williamson (2004) and Chiquiar and Hanson (2005)). We then have \( \frac{\partial R}{\partial r} > 0 \) and \( n_L x^*_H - n_H x^*_L < 0 \), and thus the optimal cost is still zero. On the contrary, if returns to skills are higher in the sending country and immigration is driven by incentives, we still have \( n_L x^*_H - n_H x^*_L < 0 \) (since immigrants are negatively self-selected) but now \( \frac{\partial R}{\partial r} < 0 \) and thus it would be optimal to impose a positive migration cost.

**Proposition 5** Keeping the quality of immigrants fixed, total immigration surplus is maximized when the migration cost is minimized. With endogenous quality the optimal cost is still zero only if \( \frac{\partial R}{\partial r} > 0 \) and \( n_L x^*_H - n_H x^*_L < 0 \).

Thus with endogenous immigrant quality policy conclusions are less clear-cut, but in the standard case efficient concerns would still call for unrestricted immigration. In this (limited) sense, we can agree with the traditional wisdom in trade theory where free trade is efficient and restrictions come from political economy factors. Indeed these have proven to be a major force in shaping policies (see e.g. Goldin (1994), Timmer and Williamson (1998) and Hatton and Williamson (2004) on the influence of different interests group on US immigration policies) and we can explore their effect in our framework through the weights \( \mu_\theta \).

### 3.3.2 Lobbying

We know (e.g. from Grossman and Helpman (1994)) that the policy bias in favor of a group of voters increases with their degree of organization in influential lobbies and with the responsiveness of their support to policy changes.

Historically low skilled workers have become more powerful (e.g. unionization). Also, they have become more scarce \( (R \) has increased) and this has given them more incentives to lobby (since the elasticity of \( w_L \) with respect to \( x_L \) increases in \( R \), they became more and more sensitive to immigration issues). Thus higher \( \mu_L \) has induced the government to adopt measure to increase (or to reduce the decrease in) low skilled wages\(^{16}\).

This might explain what was the major force behind the increasing restrictions to immigration (see Timmer and Williamson (1998) for pre World War II policies and Mayda (2004) for more recent reforms). As we argued in the previous section, immigrants tended to be positively self-selected (so \( \frac{\partial R}{\partial r} > 0 \)) and they have decreased \( R \) (i.e. \( n_L x^*_H - n_H x^*_L < 0 \)). Thus while a benthamite social planner would have set migration costs equal to zero,

\(^{16}\)Similarly, in a median voter approach, one may argue that the increasing participation of the working class in the political process (e.g. extension of the franchise) has decreased the average skill of the median voter.
lobbying activities by the low skilled organizations have induced an increase in migration costs\textsuperscript{17}.

**Proposition 6** Historically, immigration costs were increased in order to protect low skilled natives, which became more scarce and more influential.

4 Discussion

4.1 Immigration preferences and endogenous quality

Traditional explanations of attitudes towards immigration had focused on non-economic determinants (e.g. racism, ideology...). Only recently economic factors, like the impact of immigrants on the labor market, have been stressed (see Scheve and Slaughter (2001), Mayda (2004), O’Rourke and Sinnott (2004)). Here the general pattern is: high skilled are "pro immigration" and low skilled are "against immigration". This is justified by the fact that immigrants tend to be of low quality (in relation to natives) and by the (implicit) assumption that skill composition of immigrant is fixed.

Our model can be viewed as a test of this conclusions when we consider the possible effect of policies on quality (that we keep endogenous). In fact we have shown that, when immigration policies take the form of imposing costs for entry (interpreted in a very general way), this effect of policies on quality can lead to unpredicted consequences. Reducing costs relaxes credit constraints and this reduce quality ("wealth effect") but it also increases the incentive of both type to migrate, even more so for types with less incentive to start with ("incentive effect"). The direction of this second effect then depends crucially on the differential returns to skills in the sending vs. the receiving country, that are in general pretty difficult to measure.

Then, if immigrant are less skilled than natives, the assumption of exogenous quality can be innocuous as long as migration possibilities are driven by wealth constraints (since then quality and size effects go in the same direction) or source countries have very poor skill composition (with low $\frac{n_L}{n_H}$ self selection as such has a minor effect in explaining the impact of immigrants on the labor market).

Having endogenous quality can provide an explanation for the observation in Goldin (1994) and Timmer and Williamson (1998), where the pressures for immigration restrictions by low skilled natives intensified as inequality at home increased. *Ceteris paribus*, increasing inequality increases $\Delta w$ and thus increases the quality of immigrants. This is a good news for low skilled natives, and, if quality was independent on policy, they would now like to have more immigrants, i.e. reduce the cost. However, in our model, when $\Delta w$

\textsuperscript{17}By the same reasoning in countries where low skilled natives had less power we should have observed higher immigration flows (see US vs. EU) and lower quality of immigrants (see US vs. Canada and Australia).

15
is high, cost and quality are positively related. Thus, taking into account the effect of policy on quality, low skilled natives support an increase in costs even if immigrants are of high type\footnote{The correlation between rising inequality and rising opposition to immigrants can be explained also by the fact that in bad times immigrants easily become scapegoats. We sympathize with this explanation, but we leave its modeling to future research.}.

On the other hand, if source countries become richer and well educated then the incentive effect is likely to play a major role in shaping policies. In this case we might observe a change in the standard relation between natives skills and attitudes (driven by this incentive effect), where e.g. high skilled natives become hostile to policies that encourage immigration from countries with high returns to skills. Notice again how this is quite counter intuitive: countries with high returns to skills tend to send out low skilled immigrants. Taking quality as given, high skilled natives push for policies that encourage this immigration; while when quality is endogenous the effect is reversed: a decrease in costs increases the quality and thus the skill ratio, so high skilled natives oppose this policy. As we have repeatedly argued in the previous sections, immigrants tended to be positively self selected and to decrease the skills ratio in the receiving country, thus this "parameter constellation" is unlikely to be observed in existing data. Nonetheless, we think it is important to point out this theoretical possibility.

The latter observation calls for a better understanding of the relationship between skills and attitudes: either the data are not (or will not be) as clear cut as it is generally presumed, or our theoretical model is incomplete. And the latter may be because this "perfect rationality" approach is not an accurate description of how people think about the issue (they are not that "sophisticated" in forming their preferences over immigration policy since e.g. they have adaptive expectations on immigration flows, or simply they disregard the effect of this policy on the quality of immigrants). Or it may be because the labor market approach does not provide a complete explanation: the positive relation between individual skills and favorable attitudes towards immigration may not be due (entirely) to the fact high skilled have better job that allow them to avoid competing with immigrants, but for example to the fact that education makes people somewhat more "open minded", irrespective on their economic condition. Or it may be because skills are not perfectly transferable across countries, so immigrants are likely to end up with low skilled jobs anyway. We explore the latter point below and leave a deeper debate to further research.

### 4.2 Returns to skills

As we have seen, a crucial aspect of the self selection process concerns the returns to skills in the sending and receiving country. Other things equal, we’ve shown that high skilled migration occurs if 

\[
(w_L - w_L^*) + (\Delta w - \Delta w^*) - \gamma > w_L - w_L^* - \gamma, \text{ i.e. } \Delta w > \Delta w^*.
\]

Can we
say more about this? In particular, can we assess whether it would have been possible to assume something on this relationship?

The literature (e.g. Borjas (1994); Hatton and Williamson (2004)) typically proxies returns to skills with inequality, and this might be a variable directly observable in the data. However, we think that social mobility (or "meritocracy") is an equally important ingredient: having an high wage gap needs not to be a good news for an high skilled if he has low chances to access well paid jobs. To see this, assume that in the sending country high skilled have probability $p^*_H$ to get a good job (and $1 - p^*_H$ to get a bad one). So their expected wage is $EW^*_H = p^*_Hw^*_H + (1 - p^*_H)w^*_L$. In the same way, low skilled expect $EW^*_L = p^*_Lw^*_H + (1 - p^*_L)w^*_L$, with $p^*_H \geq p^*_L$ and the country is considered meritocratic the more $p^*_H \to 1$ and $p^*_L \to 0$. Similarly for the destination country. Now the requirement that returns to skills are higher in the receiving country means $(EW^*_H - EW^*_L) > (EW^*_H - EW^*_L)$, i.e. $(p^*_H - p^*_L)\Delta w > (p^*_L - p^*_L)\Delta w^*$.

Now, for example, in Mexico we have more inequality but less social mobility than in the US (as reported by Dahan and Gaviria (2001)), i.e. $\Delta w < \Delta w^*$ but $(p^*_H - p^*_L) > (p^*_H - p^*_L)$, so in theory the total effect on incentives for high vs. low skilled immigrants is ambiguous. In fact the model in Borjas (1987) based only on incentives would predict negative self-selection, but the recent findings in Chiquiar and Hanson (2005) document that this is not the case.

Our model is a reduced form that considers these probabilities only implicitly (our wages can be interpreted as these expected wages), but this illustration should make clear that it is not only the wage gap per se, but also the degree of "meritocracy", that matters in determining the incentive to migrate of the two types. Thus in general assuming $\Delta w \geq \Delta w^*$ is particularly problematic, not only due to these issues of semantics, but also because empirical evidence on cross-country inequality and social mobility is very controversial (Hassler, Rodríguez Mora and Zeira (2003) have some theoretical arguments on this).

Moreover if the access to good jobs is prevented to immigrants, so that $p^*_H \to 0$, it is clear that incentives induce negative self selection, as we consider in the next point.

4.3 Discrimination

So far we have not introduced any distinction between wages that a native and an immigrants can get in the host country. In particular we have implicitly assumed that skills are perfectly transferable across countries, so that an high skilled immigrant can be sure to get the same treatment as an high skilled native. This seems pretty strong, as it requires both that these two groups are equivalent in terms of skills and that immigrants are given the same opportunities to access well paid jobs as natives. The assumption is also contradicted by the observation of many highly skilled immigrants that end up with low skilled occupations. This aspect, to my knowledge, has not been explored in a formal model before (as recognized by Borjas (1994), footnote 30).
We think of discrimination as (partially) preventing the access to good jobs to high skilled immigrants. It can be thought as coming from immigrants inability to assimilate (language, country-specific skills) and partly as a policy variable (anti discrimination laws, recognition of foreign qualifications...).

Let $\tau$ measure the extent to which immigrants are remunerated according to their skills, i.e. the probability for an high type immigrant to access well paid jobs. Type $H$ immigrants thus (expect to) earn $w_L + \tau \Delta w$, where $\tau \in [0, 1]$ and $\tau = 0$ corresponds to full discrimination and $\tau = 1$ to full integration.

The new (average) quality of immigrants is (implicitly) defined by:

$$x_H^* = \frac{[1 - \Psi_H(\gamma)] \Phi[(w_L + \tau \Delta w) - (w_L^* + \Delta w^*) - \gamma] n_H^*}{[1 - \Psi_L(\gamma)] \Phi[w_L - w_L^* - \gamma] n_L^*}$$

The new skill ratio is:

$$\frac{N_H}{N_L} = \frac{n_H + \tau x_H^*}{n_L + x_L^* + (1 - \tau)x_H^*}$$

Let us investigate how discrimination changes the analysis of the previous sections.

### 4.3.1 Full discrimination

Consider $\tau = 0$, i.e. immigrants are treated as an homogeneous group of low skilled and there is no opportunity for them to access good jobs. High skilled foreigners have now less incentives to migrate and the quality of immigrants decreases. Moreover discrimination creates a negative spill-over on low skilled market. Thus it is bad news for all foreigners and migration flows also decrease.

High skilled natives thus always gain from immigration, since immigrants are prevented to compete with them; while low skilled natives bear all the costs. Thus high skilled natives are greatly in favor of immigration while low skilled natives strongly oppose it.

**Proposition 7** With full discrimination, size and quality of immigration are reduced. Also, the traditional correlation between skills and natives attitudes toward immigrants is reinforced.

### 5 Conclusion

The paper has developed a simple and, we believe, useful framework for analyzing the interaction between self selection and policy in determining size and quality of immigrants. It has shown how the self selection process may have different characteristics if it is driven by incentives or wealth constraints; how preferences over migration depends on skills (possibly in a nontrivial way); how immigration policies may impose inefficiently high barriers to entry.
We have adopted a "partial equilibrium" approach in analyzing the impact of foreigners in the host economy, considering what we think is the most relevant aspect (labor market) in shaping attitudes and thus pressures for policy reforms. In doing so, we have not considered the impact of immigrants on the welfare state, that is another hot topic in the recent debate. The empirical evidence on this is once again not conclusive, but there seems to be a consensus that high skilled immigrants are beneficial for the public budget. Introducing this element would lead the high skilled natives trading off the reduction in wages and the benefit in transfers in accepting high skilled immigrants.\footnote{Recently Hanson, Scheve and Slaughter (2005) have investigated the issue empirically, finding that the fiscal impact of immigrants is an important part of the picture but it does not change its main content, i.e. it does not lead low skilled natives to support further immigration.}

We have also abstracted from the issue of giving voting rights to immigrants. This might discourage high skilled natives to get too many low skilled foreigners if they will gain political power and change the policies in favor of low skilled people. One concern (in our model) is whether immigrants would vote according to their skills (so low skilled immigrants would protect their wages) or they would remain "loyal to their roots" and oppose restrictions to immigration anyway. The evidence on this is not clear. Goldin (1994) reports that immigrants lobbied for policy in favor of further immigration, and if this is the case low skilled would oppose immigration even more so if they took into account this additional effect.

Finally, being interested in studying the effect of general immigration policies on immigrant quality, we have not considered policies directly conditional on type. Historically, they have been proven to be difficult to implement and enforce (for a series of reason: asymmetric information, complexity, political feasibility...) and, more importantly, their ability to screen does not seem so effective.\footnote{See e.g. Jasso and Rosenzweig (1995) and Jasso, Rosenzweig and Smith (1998) on US immigrants, Miller (1999) on the Australian point system, and Antecol, Cobb-Clark and Trejo (2003) on Canada and Australia vs. the US.}
References


