

Human Trafficking and Illegal Migration

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Abstract

We analyze the role of traffickers in illegal migration. Traffickers finance liquidity-constrained migrants. Migrants enter temporary servitude to pay back the debt. When it becomes easier to transit from the illegal to the legal sector of the host country, more migrants default on their debt (in the legal sector, trafficking agreements are harder to enforce). Then, to finance migration becomes unprofitable for traffickers. Regularization campaigns, amnesties, more lenient deportation policies thus *decrease* rather than increase the flow of illegal migrants. We also show that they improve skill composition of immigrants.

Key Words: Immigration, indentured servitude, contract theory, liquidity constraints.

JEL Classification Numbers: F22, J61, O15, P23

1 Introduction

Illegal migration is a problem of growing scale and importance for many developed countries. According to conservative estimates (Skeldon, 2000), there is a stock of around 11 million irregular migrants worldwide. Many illegal migrants resort to traffickers, and the business of human trafficking has reached a scope of many billion dollars a year (Kyle and Koslowski, 2001). Illegal migrants pay large sums to the traffickers. Chinese migrants pay up to 35,000 USD per capita to migrate to the US (Chin, 1999) and 25,000 USD to migrate to the EU (Business Week, 2000). Migrants from Egypt pay 5,000 USD, migrants from Afghanistan pay 10,000 USD to enter the EU (Business Week, 2000), and Kurds from Turkey 8,000 USD (Kyle and Koslowski, 2001).

What can be done against illegal immigration? The suggested policies cover a broad range, but little is known about the relative effectiveness of different policies. Chin (1999, p. 162) expresses what many believe to be crucial: “*The best way to attack the smuggling networks is to deprive them of their profits.*” Unfortunately, it is difficult to detect traffickers, and even more difficult to get hold of their profits. They are oftentimes well-organized multi-national businesses that are beyond the reach of any single policy maker. Under weak policy coordination, it is hard to tackle the trafficking business directly.

We argue that there are policies that have *indirect* effects on the profitability of the trafficking business. According to our theory, regularization campaigns, amnesties for illegal migrants, more lenient deportation policies, and any other policies that make it easier and less risky for migrants to gain regular status¹ have three things in common. First, they reduce the expected profits of traffickers and thus help to combat illegal migration. Second, they increase legal migration (and may or may not increase the total of illegal and legal migration). Third, they unambiguously improve the skill composition of migrants.

The logic of our argument is simple. Policies that regularize (legalize) illegal migrants reduce the enforceability of debt contracts between intermediaries and migrants. In our contract-theoretical model (section 3), there are a source country and a host country. Workers in the source country may wish to migrate because wages in the host country are higher. Migration involves costs that need to be paid upfront, but many potential migrants do not have enough cash. However, rich intermediaries/traffickers may be willing to lend migrants the funds needed to finance migration. If the migrant has no collateral, there is only one way to make such a debt contract enforceable. The migrant must commit

¹In what follows we will sometimes use the generic term “regularization measures” for any of the above policies.

his workforce to the exclusive use of the intermediary in the source country. Put differently, the migrant enters a relationship of temporary slavery with the intermediary or its business partners, until he has paid back the debt, for instance through work in a sweatshop (Chin, 1999). As this contract collides with the labor legislation of the host country, it can only be enforced in the illegal sector of the host country. Here, there are potentially drastic measures to enforce payments, but when transiting to the legal sector, the migrant is, at least partially, protected from coercion by the trafficker. Moreover, as the legal system of the host country will not enforce repayment of the debt, the migrant defaults when he receives legal status.

This risk of default implies first, that intermediaries may not find it worthwhile anymore to finance migration, involving that the number of illegal migrants *decreases*. Second, by the same token, migration becomes more attractive for other workers. Wealthier workers in the source country may be interested in migrating and working in the legal sector of the host country. When entry into the legal sector becomes easier, their expected returns to migration increase, involving that the number of legal migrants *increases*.² Third, the skill composition of migrants improves: less poor, low-skilled workers immigrate illegally; more rich, high-skilled workers immigrate legally.

Section 4 relaxes some of the assumptions, and extends the analysis. We investigate the effect of border controls on flows and skill composition of migration, and compare them to the ones of the regularization measures analyzed before. In other models on illegal migration, for instance, Ethier (1986), Epstein and Weiss (2001), both border control and domestic measures have similar effects. When these policies get more severe, the flow of illegal migrants decreases. Our paper shows that this may not hold when one incorporates the role of traffickers and other intermediaries into policy analysis. When border controls are more severe, the cost of migration goes up, less migration occurs, and on average, migrants are richer. However, being tougher in regard to regularization measures may work in the opposite direction as this increases the enforceability of the migration/servitude contract analyzed above.

Our analysis is positive. Nevertheless, we would like to point out that it appears an appealing choice for policymakers to be more lenient with respect to illegal migrants. Deportations are inhumane and costly. According to our theory, they are useless or even counterproductive in reducing the stream of illegal immigrants, as they decrease the incentives of migrants to apply for legal status, and thus make debt contracts between traffickers

²The net effect on total migration flows (legal plus illegal) depends on the parameters.

and migrants more easily enforceable. Clearly, there are costs associated with regularization measures. Making the transit between legal and illegal sector easier, may increase the total flow of migrants. But, as the average skills of migrants increase, and higher-skilled immigrants are complements rather than substitutes to domestic workers with lower skills (Zimmermann, 1994), these policies may meet rather little political resistance. Finally, regularization policies appear to be cheaper than border controls that, in addition, have proven to be rather ineffective both in protecting the domestic workforce (Hanson et al., 1999) and in preventing migrants to enter (Kyle and Koslowski, 2001).

The next section provides background on illegal migration and the trafficking business. Section 3 sets up the model and establishes the main result. Section 4 relaxes some of the assumptions and investigates the comparative effect of border controls and legalization. Section 5 concludes.

2 Background

In this section we motivate the assumptions of our model. Migration takes different forms, depending on who migrates and to which countries, but there are some general, undisputed features we focus on here. One important point should be noticed: our analysis holds if the costs of migration are too high to be paid upfront by the migrant. Thus, it may be appropriate for long-haul migrations, but less for short hauls, for instance, between Mexico and the US, or Albania and Italy.

Motivation for migration: Most authors agree that the single most important motive to migrate illegally is economic, although there are also many political asylum-seekers among the migrants. For the purpose of our analysis, it is secondary whether people migrate because they are prosecuted or because they want higher wages. What is important is that migrants expect to improve their situation through migration, and that they need the assistance of traffickers and other intermediaries to do so.

Information: There is a widespread belief in the public that most migrants are tricked by traffickers. Indeed, there is evidence that women and children migrants are tricked into debt and prostitution by criminal individuals and organizations (Demleitner, 2001). More generally, most migrants know quite well what to expect (Skeldon, 2000). This concerns not only the costs and non-monetary risks involved with illegal migration, but also the oftentimes very poor living conditions in the host countries. Chin's book (2001), for instance, shows that most Chinese migrants come from the same few provinces. They benefit from

the fact that relatives and friends may have migrated before them providing them with useful information. The informational benefits of this “chain migration” are not available for migrants, who do not have access to this type of information, or are deliberately misinformed by traffickers. However, lacking information can only be a transitory phenomenon. O’Rourke and Williamson (2000) argues that migrants in the 19th century were well informed about migration prospects, at a time when information travelled by boat. There is little reason to believe that, in times of telephone networks and the Internet, informational frictions could survive for long.

The migration contract: As noted in the Introduction, the costs associated with migration are very high, and only few rich individuals or families can afford migration.³ However, many potential migrants have access to intermediaries who arrange air, sea or ground transport, provide forged documents and assist in entering the country of destination. Long-haul migration is organized in rather similar ways whether migrants come from China, Russia (cf. Finckenauer, 2001), or Asia (Business Week, 2001). The migrant may or may not pay a downpayment (up to 20 per cent of the total fee). The trafficker arranges the transfer to the host country, by sea, land or air transport. He also ensures entry into the host country. Upon arrival, the migrant is usually kept in a “safe house” or sweatshop until the debt has been paid back. In principle, the worker thus provides his workforce as collateral to the trafficker or its business partners.

Repayment of debt: Debt is either paid by relatives of the migrant or through the migrant’s work for traffickers or their business partners. In the case of Fujian Chinese, repayment takes between half a year and four years with an average of 26 months (Chin, 1999, p. 119). There are cases of abuse, but it is hard to imagine that they are the rule (Skeldon, 2000). Otherwise, migrants would barely enter contractual relationships with traffickers. Involuntary slavery exists, but most of it is concentrated in the non-OECD countries (Bales, 2000). Much of the illegal migration business appears to follow the spirit of the migration/debt contract quite closely. In particular, workers are usually set free after the debt has been paid back. Economic history provides an interesting parallel — “indentured servitude”. Between one half and two-third of all white immigrants coming to the Northern American British Colonies between 1630 and the Revolution came as indentured servants, that is, they exchanged, temporarily, their workforce and freedom

³Top fees for Chinese to come to the US, for instance, reached 35,000 USD in the mid 1990s and have been rising steadily by almost two thousand USD per year. A survey of 300 illegal Chinese immigrants from Fujian province shows that 90% had to borrow to pay the fee, even though the province is among the richest ones in China (Chin, 1999).

against a free passage to the colonies (cf. Galenson, 1984). There was occasional abuse of workers, but in general the terms of the contract were respected. In particular, workers were freed after they had paid their debt. Modern temporary slavery appears to follow a similar pattern. In contrast to the case of indentured servitude in the British colonies, modern temporary slavery is not legal. However, human trafficking appears to be a competitive business (Skeldon, 2000). Hence, reputational concerns appear to keep traffickers and their partners from treating migrants too badly or from extending their temporary slavery unduly.

3 The model

Our model is inspired by the stylized facts presented above. In particular, while migrants may sometimes be tricked into illegal migration, they usually appear to know quite well what to expect. Thus, we assume that all parties are rational; they know their payoffs in both the legal and the illegal sector of the host country, the risk of being deported back to the source country, and the associated payoffs.

We consider a game between two agents. A worker W ('he') initially resides in the source country but may wish to migrate to the host country, with the help of an intermediary, or 'trafficker', T ('it'). Both parties live for two periods. Without loss of generality, we set the time discount to zero. The parties maximize their respective payoffs over the two periods, labelled U^W and U^T . We assume that the worker is wealth-constrained, while the trafficker has unlimited access to credit market at zero cost. In the source country, W 's productivity is r . In the host country, W can either work in the legal sector with a productivity of R , or in the illegal sector, with a productivity of \tilde{R} .⁴ The worker is initially endowed with wealth a .

In what follows, we first describe timing and the migration contract. Then, we present our assumptions about payoffs and productivity. In the last two subsections, we first solve the model for a benchmark without intermediary, and then derive the main results of the model.

⁴We use capitals for variables related to the host country, and small case for the source country.

3.1 Timing and migration contract

At the beginning of the first period ($t = 0$), W and T can agree that T takes W to the host country. Without loss of generality, we assume that the market for traffickers is competitive.⁵ Hence, W makes T a take-it-or-leave-it offer. The contract specifies that T takes W to the illegal sector of the host country, and that, in exchange, W makes two payments: an upfront payment P_1 , and, in the second period, a payment of P_2 . W must have enough cash to make the downpayment (P_1) agreed upon:

$$a - P_1 \geq 0$$

W owns no collateral. Hence, T will only accept to take W to the host country, if it can be assured that until P_2 is paid, T owns the product of W's work. Such a contract effectively puts W in a situation of temporary, voluntary servitude. This contract is only enforceable if W is employed in the illegal sector. Here, there are — potentially drastic — measures to enforce payments, but by transiting to the legal sector, W is protected from coercion by the trafficker. Moreover, as the contract between W and T is not consistent with labor law in the host country, T cannot use the legal system to enforce payment of P_2 .⁶ Hence, transiting from illegal to the legal sector allows W to default on his debt. This effect is crucial for our results.

At $t = 1$, T either accepts or rejects the offer. If T rejects, W stays in the source country for the second period. If T accepts the offer, W migrates and spends the second period in the host country. Migration has costs M . It can be influenced by government policies. A good example of policies that increase M are tougher border controls.

Once the worker has arrived in the host country, he may try to receive legal status. We assume, without loss of generality, that there is no direct way into the legal sector of the host country. With probability $(1 - \pi)$, he succeeds, while with probability π , W is deported back to the home country (at the host country's taxpayers' expense). Any policies that make it easier for migrants to gain legal status can be represented by decreases in π . We will sometimes use the term regularization policies for these policies.

At $t = 2$, production takes place and both parties receive their payoffs.

⁵This is an assumption in line with Kyle and Koslowski (2001) and Chin (1999), who show that the involvement of mafia-type organizations in illegal migration is much lower than usually considered.

⁶We exclude here for simplicity that T could retaliate against W's family in order to gain a reputation of being tough. This could make the transit between illegal and legal sector less attractive. We also do not look at the potential abuse of power in the illegal sector where T or his partners may extort more than P_2 from the worker.

3.2 Payoffs

The worker: If W stays in the source country, he receives a wage $w = r$. Therefore, his overall utility is

$$U_s^W = a + r.$$

If W has migrated and remains in the illegal labor market, he works under the purview of T. The trafficker appropriates the product of W's work to ensure payment of P_2 , and the worker receives the residual. The payoff of the worker in the illegal sector is thus:

$$U_i^W = a - P_1 + \tilde{R} - P_2 \quad (1)$$

W can also decide to apply for the legal status. This has the following costs and benefits. On the benefit side, if the worker manages to transit to the legal sector, his productivity changes from \tilde{R} to R . Moreover, as discussed before, transiting from the illegal to the legal sector allows W to renege on the payment of P_2 . On the cost side, W faces a risk when applying for legal status, as with probability π he is sent back to the home country. In expected terms, W's utility of applying for legal status is thus:

$$U_l^W = a - P^1 + (1 - \pi)R. \quad (2)$$

Here, if sent home, W receives a payoff of $a - P_1$ (he does not pay P_2). With probability $(1 - \pi)$, he becomes a legal resident, defaults on his debt to T, and receives his full productivity.

The trafficker: If W stays in the source country, T receives:

$$U_s^T = 0$$

The payoff of T if the worker stays in the illegal sector is:

$$U_i^T = P_1 + P_2 - M \quad (3)$$

When W applies for legal status, T never receives P_2 , as W either defaults strategically when entering the legal sector or cannot payback the debt when sent home. Thus, T's payoff is:

$$U_l^T = P^1 - M. \quad (4)$$

We have assumed that the market for intermediaries is competitive. Thus, (3) and (4) cannot exceed zero in equilibrium.

3.3 Productivity assumptions

Here, we here make certain assumptions on the correlation between wealth and skills. We assume that initial wealth and skills (productivity) are positively correlated. This will be relaxed in the next section.

First, in the illegal sector of the host country, there is no skill premium. Thus, \tilde{R} does not depend on a .⁷ This reflects the fact that independently of their skills, illegal workers usually work in low-skilled jobs, for instance, in the garment industry or restaurants (Kwong 2001).

Second, for the legal sectors in the home and host country respectively, we assume the simplest possible returns to skills:

$$r = \begin{cases} r^H, & \text{if } a \geq M \\ r^L, & \text{if } a < M \end{cases}, \quad r^H > r^L;$$

and

$$R = \begin{cases} R^H, & \text{if } a \geq M \\ R^L, & \text{if } a < M \end{cases}, \quad R^H > R^L.$$

This second set of assumptions makes the model easily tractable. It assumes that wealth and skills are perfectly correlated, i.e., if W holds $a \geq M$ ($a < M$) cash, he has high (low) skills. Moreover, workers who are high- (low-) skilled in one country, are high- (low-) skilled in the other country as well, and all high-skilled workers have enough cash to finance their migration, while low-skilled workers do not have enough cash. In the next section we show that our results hold qualitatively under less restrictive assumptions on productivity.

Third, migration to the illegal sector is attractive to low-skilled workers but not to high-skilled workers:

$$r^L < \tilde{R} - M < r^H \tag{5}$$

Due to the setup of our model, the only way to migrate for the high-skilled workers is to go to the illegal sector, then apply for legal status, which is granted with probability $(1 - \pi)$, while with probability π , the worker is sent home.

⁷This is a simplifying assumption reflecting the fact that returns to skills in the illegal sector are lower than in the legal sector. More generally, one could assume that the sensitivity of productivity with respect to wealth is larger in the legal sector than in the illegal sector.

As a benchmark, we first look at a situation in which there exist no traffickers. We then solve the model that we have set up above, and compare the effects of changes in the policy variable π that captures the ‘toughness’ of naturalization policy.⁸

3.4 Benchmark: no intermediary

Without intermediary, the worker must pay the cost of migration upfront, that is the contract space degenerates to: $P_1 = M$ and $P_2 = 0$. In this case, low-skilled workers, i.e. all workers with $a < M$, cannot migrate because of wealth constraints. High-skilled workers ($a > M$) are not interested in migration to the illegal sector, as assumed in (5). To check whether they would like to migrate to the legal sector, we compare U_l^W with U_s^W , and obtain Result 1.

Result 1: *When there are no intermediaries, or, equivalently, the contract space is restricted to $P_1 = M$ and $P_2 = 0$, there is only migration to the legal sector. Migration occurs if and only if (i) $a > M$, and (ii) the following condition holds:*

$$(1 - \pi)R^H > r^H + M. \quad (6)$$

The left-hand side (LHS) of (6) represents the expected wage in the legal sector (with probability π , W is deported home), and the RHS is a skilled worker’s payoff when staying in the source country. The policy effects are as expected: When π increases, the migration is less likely.

3.5 Migration with intermediary

To solve for equilibrium we consider W’s payoffs for the three outcomes: “stay in the source country”, “migrate and work in the illegal sector”, “migrate and apply for legal status”. We also have to ensure that T’s individual rationality constraint (IR) is satisfied, that is, that it does not make losses $U^T \geq 0$. This comparison leads to the first proposition.

Proposition 1 *The equilibrium under the productivity assumptions above is as follows:*

⁸It should be noted that in our model π captures only the risk of being deported when a migrant attempts to receive legal status. In principle, one could consider a third policy parameter capturing the risk of being detected in the illegal sector and subsequently deported, which here we normalize to nil.

1. Migration to the illegal sector occurs if and only if (i) W is low-skilled ($a < M$), and (ii)

$$a \geq M - \left(\tilde{R} - (1 - \pi)R^L \right). \quad (7)$$

The contract stipulates that $P_1 = a$, and $P_2 = M - a$.

2. Migration to the legal sector occurs if and only if (i) W is high-skilled ($a \geq M$), and (ii) condition (6) holds. The contract stipulates that $P_1 = M$ and $P_2 = 0$.
3. No migration occurs otherwise.

Illegal migration of *low-skilled* workers is more likely if the returns for low-skilled work in the illegal sector are relatively large, compared to the returns in the legal sector, and if the probability of being deported is high. By assumption (5) it is worthwhile for a low-skilled worker to migrate to the illegal sector. The migration-debt contract is incentive compatible only if $P_2 \leq \tilde{R} - (1 - \pi)R^L$ (otherwise the worker would apply for the legal status and default, compare (1) and (2)). Hence, the participation constraint of the trafficker $U^T \geq 0$ is satisfied only if $a + \tilde{R} - (1 - \pi)R^L - M \geq 0$ which is equivalent to (7) stated in the Proposition. If this condition does not hold, T does not break even and is not willing to finance a low-skilled W 's migration.

For the high-skilled worker, assumption (5) ensures that he would not want to migrate to the illegal sector. Condition (6) states that migration of high-skilled workers is more likely if the productivity differential between the legal sectors of the two countries is high, and the probability of being deported is low.

Consider now the case where both (7) and (6) hold. What is the impact of a change in π ?

Proposition 2 *Comparative statics: A decrease in π , i.e. softer regularization policy, has the following impact on migration:*

1. *Illegal immigration of low-skilled workers becomes less likely.*
2. *Legal immigration of high-skilled workers becomes more likely.*

The intuition for Proposition 2 is straightforward. When π decreases, condition (7) becomes *less* likely to hold. Then, the risk of W 's default on P_2 increases, and intermediaries do not finance migration to the host country's illegal sector. By the same token, condition (6) becomes *more* likely to hold, that is, high-skilled workers find migration to the host country's legal sector more attractive.

The term $\tilde{R} - (1 - \pi)R^L$ represents the value of the ‘pledgeable income’ in the debt contract between W and T, that is, the maximum possible amount that T can lend W. If government pursues regularization policies, the value of the pledgeable income decreases. Thus, liquidity-constrained workers lose access to the funds of intermediaries.

4 Generalized model

Previously, we assumed perfect correlation between skills and wealth. Low-skilled workers were always liquidity-constrained, while high-skilled workers could always finance migration with their own funds. Here, we drop this assumption. We also generalize the setting by introducing a continuum of workers. This allows us to compare the effect of measures increasing M , for instance, border controls, to policies that increase π , for instance, tougher regularization and deportation rules.

4.1 Assumptions

The source country is populated with a continuum of workers normalized to 1. There are two types of workers: high-skilled with home productivity r^H , and low-skilled with productivity r^L . The share of high-skilled workers is λ . Wealth among high-skilled (low-skilled) workers is distributed according to a c.d.f. $F_H(a)$ ($F_L(a)$), the corresponding density functions are $f_H(a)$ ($f_L(a)$). Thus, for a worker with skills $j = L, H$, the probability to have wealth in the range $[a, a + da]$ is $f_j(a)da$.

We still assume that low-skilled workers are interested in migration to the illegal sector and high-skilled workers are not (condition (5)). We also keep the assumption that there is no skill premium in the illegal sector, i.e. \tilde{R} is the same for both high- and low-skilled workers.

Productivity in the legal sector depends on skills. Low-skilled workers earn R^L in the legal sector, while high-skilled workers earn wage R^H . The low-skilled wage is distributed on $[\underline{R}^L, \overline{R}^L]$ with c.d.f. $G_L(R^L)$; the high-skilled wage is distributed on $[\underline{R}^H, \overline{R}^H]$ with c.d.f. $G_H(R^H)$, with the corresponding density functions g_H and g_L . To make things simple, we assume $\underline{R}^L = 0$, and $\underline{R}^H = \overline{R}^L$. Productivity is not correlated with wealth. Workers and traffickers know the host country productivities at the time of migration, $t = 1$.

4.2 Equilibrium

The analysis is similar to that of subsection 3.5. The main difference is that there is now a positive number of low-skilled workers, who are not liquidity-constrained. They can migrate without entering a debt/servitude contract. Depending on the sign of $\tilde{R} - (1 - \pi)R^L$ they will go either to the legal or to the illegal sector.

Straightforward calculations yield the following proposition.

Proposition 3 *Equilibrium under the assumptions in 4.1 is as follows:*

1. *Inflow of low-skilled migrants to the illegal sector, financed through a debt/servitude contract is given by:*

$$\mu_{debt}^L = (1 - \lambda) \int_0^{\tilde{R}/(1-\pi)} \left[F_L(M) - F_L\left(M - \left(\tilde{R} - (1 - \pi)R^L\right)\right) \right] g_L(R^L) dR^L.$$

2. *Inflow of high-skilled migrants to the legal sector, financed by own funds, is given by:*

$$\mu_i^H = \lambda [1 - F_H(M)] \left(1 - G_H\left(\frac{r^H + M}{1 - \pi}\right) \right). \quad (8)$$

There is no high-skilled migration to the illegal sector.

3. *Inflow of low-skilled migrants to the legal sector, financed by own funds, is given by:*

$$\mu_i^L = (1 - \lambda) [1 - F_L(M)] \left(1 - G_L\left(\frac{\tilde{R}}{1 - \pi}\right) \right). \quad (9)$$

4. *Inflow of low-skilled migrants to the illegal sector, financed by own funds, is given by:*

$$\mu_{own}^L = (1 - \lambda) [1 - F_L(M)] G_L\left(\frac{\tilde{R}}{1 - \pi}\right).$$

Note that except for migrants in case (1) of the proposition, nobody enters a debt/servitude contract. Index “debt” represents migration financed through a debt servitude contract to the illegal sector; “own” migration to the illegal sector financed by the worker’s own funds. Figure 1 illustrates how migration depends on the worker’s productivity R and wealth a . Cases (1) and (2) are similar to the respective cases in Proposition 1. Cases 3 and 4 emerge because we drop correlation between skills and wealth. Low-skilled workers who are not liquidity-constrained can migrate without entering a debt/servitude contract.

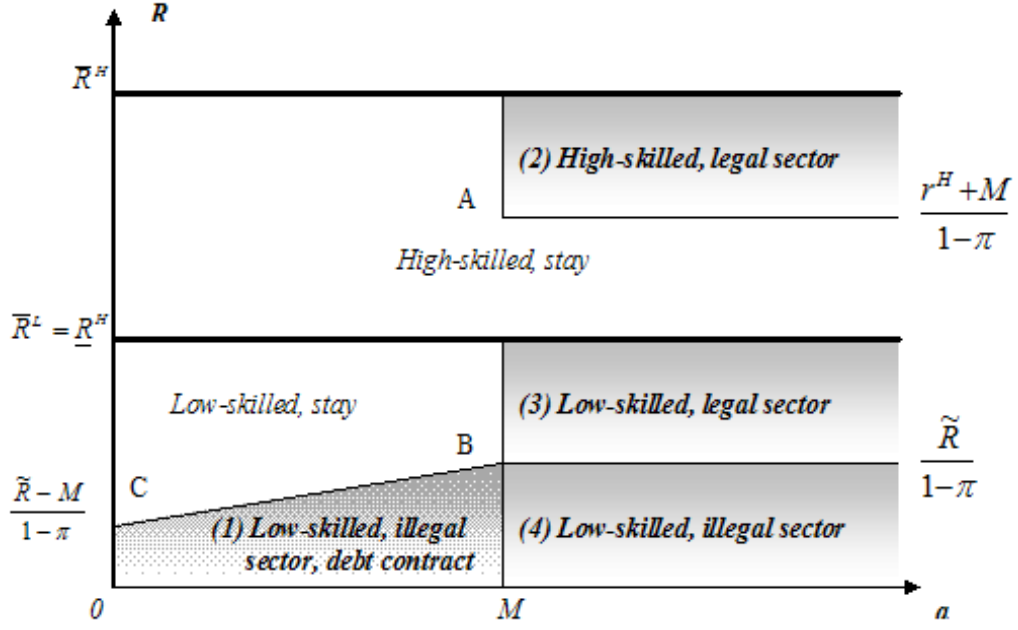


Figure 1: Structure of immigration in (a, R) space. Shaded areas represent groups of immigrants defined in Proposition 3.

4.3 Comparative statics

We are now ready to analyze the effect of changes in π and M on migration flows as classified in Proposition 3 and illustrated in Figure 1. Our analysis remains positive.

Proposition 4 *Under (5) and the assumptions of subsection 4.1, the following holds:*

1. *An increase in M decreases both high- and low-skilled migration. It also decreases both legal and illegal migration.*

$$\frac{\partial \mu^H}{\partial M} < 0, \frac{\partial \mu^L}{\partial M} < 0;$$

$$\frac{\partial \mu_i}{\partial M} \equiv \frac{\partial (\mu_i^H + \mu_i^L)}{\partial M} < 0, \frac{\partial \mu_i}{\partial M} \equiv \frac{\partial (\mu_{debt}^L + \mu_{own}^L)}{\partial M} < 0.$$

2. *An increase in π decreases high-skilled, but increases low-skilled migration. It decreases legal, but increases illegal migration.*

$$\frac{\partial \mu^H}{\partial \pi} = -\lambda \frac{1 - F_H(M)}{(1 - \pi)^2} g_H \left(\frac{r^H + M}{1 - \pi} \right) < 0,$$

$$\begin{aligned}\frac{\partial \mu^L}{\partial \pi} &= \frac{\partial \mu_{debt}^L}{\partial \pi} = (1 - \lambda) \int_0^{\tilde{R}/(1-\pi)} R^L f_L \left(M - \left(\tilde{R} - (1 - \pi)R^L \right) \right) g_L \left(R^L \right) dR^L > 0; \\ \frac{\partial \mu_l}{\partial \pi} &\equiv \frac{\partial \left(\mu_l^H + \mu_l^L \right)}{\partial \pi} < 0, \quad \frac{\partial \mu_i}{\partial \pi} \equiv \frac{\partial \left(\mu_{debt}^L + \mu_{own}^L \right)}{\partial \pi} < 0.\end{aligned}$$

The first part of Proposition 4 states that an increase in M decreases high-and low skilled migration, and legal and illegal migration. This implies that total migration decreases.

The intuition of the second part of the proposition is as follows. When π increases, the payoffs of all workers to migrate to the legal sector decrease. As high-skilled workers never migrate to the illegal sector (by condition 9), the flow of high-skilled decreases. The effect on low-skilled workers is more complex. Notice first that the impact of π on the flow of low-skilled workers can be decomposed in:

$$\frac{\partial \mu^L}{\partial \pi} = \frac{\partial \mu_l^L}{\partial \pi} + \frac{\partial \mu_{debt}^L}{\partial \pi} + \frac{\partial \mu_{own}^L}{\partial \pi}.$$

One can readily show that $\frac{\partial \mu_l^L}{\partial \pi} = -\frac{\partial \mu_{own}^L}{\partial \pi} < 0$, that is the decrease in legal migration of low-skilled workers cancels with the increase in illegal migration of low-skilled workers who migrate to the illegal sector without entering a debt/servitude contract. (The preferences of low-skilled workers with enough cash to migrate simply shift from legal to illegal migration.) However, $\frac{\partial \mu_{debt}^L}{\partial \pi} > 0$. The intuition is that when π increases, the pledgeable income for the debt/servitude contract increases, hence more low-skill workers enter a debt/servitude contract and migrate to the illegal sector. The total effect is thus that there are more low-skilled workers who migrate.

Figures 2 and 3 in the Appendix illustrate the Proposition. An increase in M shifts points A in north-east direction, B to the east, and C to the south (Figure 2). Hence immigration in all categories decrease: both legal and illegal immigration decreases, and both high-skilled and low-skilled immigration decreases.⁹

In Figure 3, an increase in π shifts points A, B and C north. Some of the low-skilled legal migrants (3) switch to illegal migration (4). High-skilled migration (2) decreases. The number of illegal migrants who borrow from the intermediary (case 1) increases. This graphical analysis demonstrates the main result of our model. Lenient regularization policies, amnesties and lenient deportation policies prevent some illegal migrants (1) from

⁹The flow to the illegal sector with a debt/servitude contract (category (1)) may increase. Indeed, some of the low-skilled illegal migrants who used to migrate using their own funds stay at home, but some switch to debt/servitude contract (area *IV* in the Fig.2). However, the total flow of illegal immigrants (sum of categories 1 and 3) always decreases.

coming. The effect on total immigration can be positive or negative, depending on the sign of $\partial\mu^L/\partial\pi - \left|\partial\mu^H/\partial\pi\right|$. In Fig.3, migration increases if and only if the area *I* is larger than area *II*.

As a corollary of Proposition 4, we obtain the last proposition.

Proposition 5 *The effect of the policy variables on the skill composition of immigrants is as follows.*

1. *An increase in M has ambiguous effects on the skill composition of migrants.*¹⁰
2. *An increase of π increases the flow of low-skilled, and decreases the flow of high-skilled. The skills of the average immigrant thus decrease.*

Two remarks. First, the combination of the two policy instruments can be sufficient both to raise the skill composition of immigration and control the total migration inflow. More lenient regularization policies decrease low-skilled migration and increases the high-skilled migration. If the total migration turns out to be too high, then by applying stricter border controls, one may be able to keep the total inflow of migrants in check.

We finish with a remark that highlights the importance of considering the role of intermediaries in models of illegal migration. In the absence of intermediaries any increase in π would unambiguously decrease immigration as, without intermediaries, workers with $a < M$ can never migrate. However, there is ample evidence of migration financed by intermediaries.

5 Conclusions

We have shown that more lenient legalization and regularization policies may have the surprising effect to decrease illegal migration. They may or may not increase total flows of immigration, and unambiguously improve the skill composition of immigrants.

Everybody seems to agree that illegal migration and trafficking are serious problems, and that they should be tackled systematically. However, there is a lack of model analysis to fully understand the effect of different policies, and the costs that may be associated

¹⁰Fig.2 illustrates the first part of the Proposition. The effect on skill composition depends on the relative size of area *I* compared to *II*, *III* and *IV* combined. Notice that if skills and wealth were correlated (e.g. if $f_H(a)/f_L(a)$ increased in a), an increase in M would improve skill composition. This is similar to the conventional results on the self-selection of immigrants (Borjas, 1994, or Chiswick, 1999) where high-ability workers face higher returns and/or lower costs of migration.

with them. Sometimes, even the best scholars of illegal immigration seem not to be aware that their recommendations are contradictory. Chin (1999), for instance, suggests to deprive traffickers of their profits by encouraging the immigrants to default on their debt. On their hand, he recommends that governments should be tougher on deporting illegal migrants to combat trafficking and sweatshops. The model shows that these two policies are contradicting each other: in order to be able to default on his debt, a migrant needs to be protected by the legal system of the host country. He will not seek this protection, if he has to fear to be sent back home. Lenient deportation policies may thus provide the best incentives to come out of the shadow, default on the debt, and to deprive traffickers of their profits.

Nobody knows how many illegal migrants would default on their debt if it became easier to receive legal status. While, for instance, most Chinese migrants are financed through debt, many of them might not want to default because of reputational losses for themselves or their families. Reputation is important when most economic activity takes place within a given ethnic community. However, the very fact that in order to enforce debt payments, migrants are held in safe houses and work in sweatshop shows that reputational concerns may not be strong enough to avoid default. Then, any policy increasing this default risk will have the effects that we highlight in our paper.

We have not brought forward any normative perspective. Immigration policy rarely pursue a single goal, but there appears to be much compassion for enslaved immigrants, and political resistance against low-skilled migration. Our analysis indicates that legalization and regularization campaigns, and more lenient deportation policies may indeed meet both objectives.

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Appendix: Comparative statics

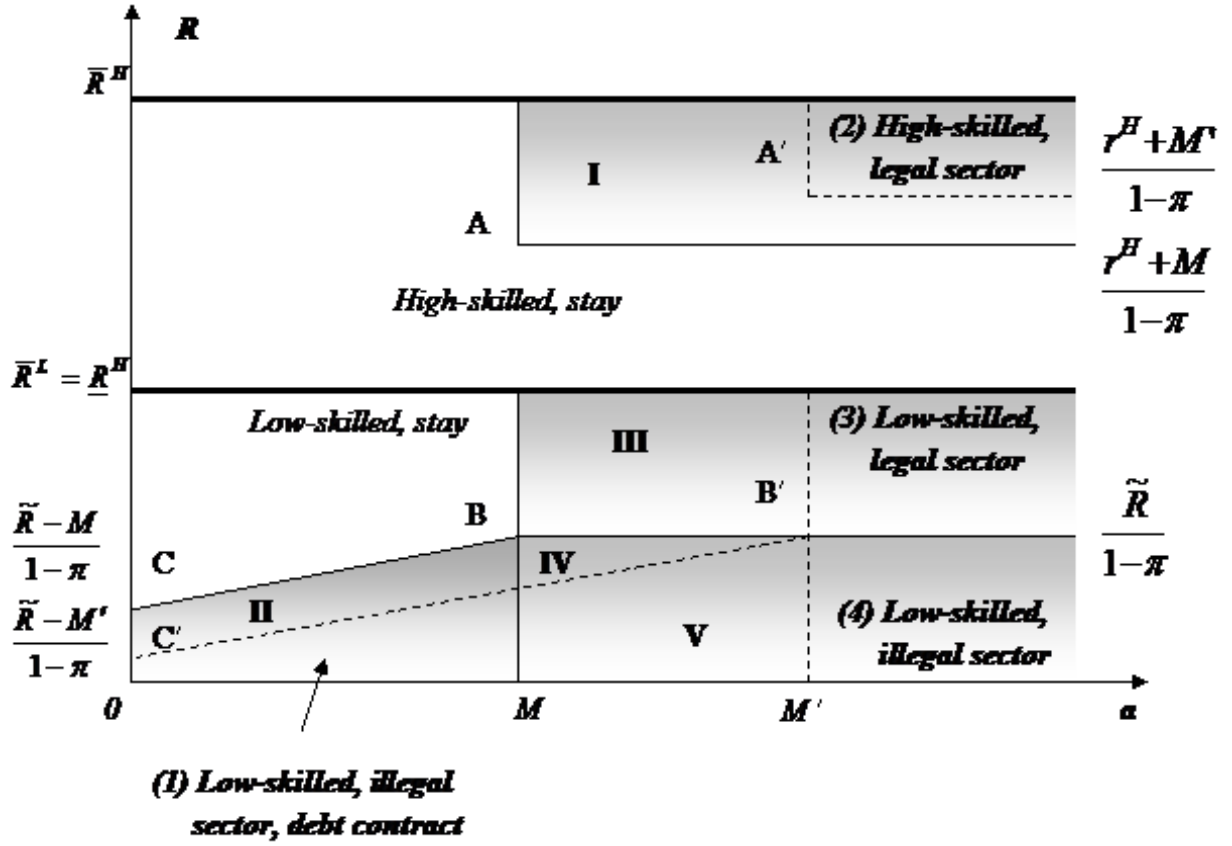


Figure 2. The effect of an increase in the migration cost from M to M' . Areas $I - IV$ represents the workers who used to migrate but now prefer to stay home: (I) high-skilled workers who used to migrate to the legal sector; (II) the low-skilled people who used to migrate through a debt contract; (III) low-skilled who used to migrate to the legal sector; (IV) low-skilled who used to migrate to the illegal sector without debt contract. Area V represents the low-skilled illegal workers who used to migrate without debt contract but now have to resort to the finance from intermediary and migrate to the illegal sector through temporary servitude.

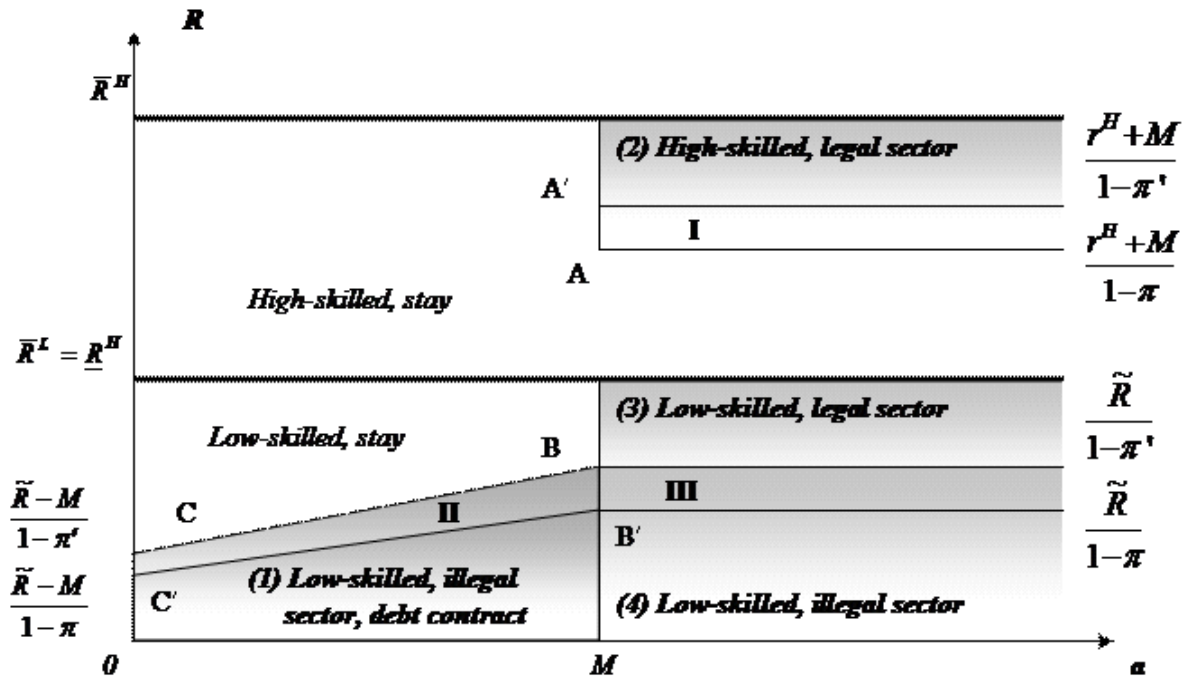


Figure 3. The effect of increase in π to π' . Area I represents the high-skilled workers who used to migrate to the legal sector but now prefer to stay at home. Area (II) represents the low-skilled people who used stay at home but now migrate to the illegal sector through a debt contract. Area (III) is the low-skilled migrants who switch from legal to illegal migration.