A Simple Model of Immigration Amnesties*

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Abstract

We study the outcome of an immigration amnesty for a government that faces a trade-off between minimizing the number of unwanted immigrants and expanding the tax base. An amnesty can indeed be used not only to expand the tax base, but also to induce irregular immigrants to emerge in order to deport them. This creates a commitment problem for the government. We show that in the time-consistent equilibrium there exist an incentive to grant the amnesty only to the richest immigrants, while the poorest are deported. As a consequence, the fiscal benefit is sub-optimal and poor immigrants stay illegal. We also show that a reputation-based efficient equilibrium is possible only under restrictive conditions.

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1 Introduction

Immigration amnesties are a frequent event in many countries. As reported by Epstein and Weiss (2001) and by Krieger and Minter (2007), we can observe several legalizations of illegal immigrants. Why should a country grant such amnesties? Epstein and Weiss (2001) stress that clandestine workers do not pay taxes, tend to be free riders and are more involved in illegal activities. Chau (2001) proves that an amnesty can be used in an immigration reform in order to incentivate irregular workers to emerge when internal controls are weak.

Epstein and Weiss (2001) develop a very general framework to the theory of immigration amnesties.

In this paper, instead, we restrict our attention to two features: first, once a stock of illegal immigrants exists, there is an incentive to increase the tax base by granting an amnesty. Second, as far as a government is interested in minimizing

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the stock of immigrants, the government has a moral hazard to use the amnesty to detect and deport the illegal immigrants. [**...**] These motives are presented in Epstein and Weiss (2001) as well. However, in contrast to their results, we stress the crucial importance of dynamic inconsistency in generating uncertainty over the effective regularization, and, as a consequence, the sub-optimality of amnesties.

In addition, we argue that the very nature of illegal immigration makes it extremely difficult to achieve the first best and that amnesties can only occur at irregular intervals. As a consequence, we can characterize efficient equilibria only within a stochastic game. The paper is organised as follows: after the introduction, section 2 presents our model and our results, section 3 discusses the issues related to the timing of the amnesties, section 4 develops the repeated game, and section 5 summarizes our conclusions.

2 The Model

2.1 The immigrant's problem

Suppose the population of illegal immigrants is made of n groups of workers who earn a wage w_i $(i = 1...n)$. Wages are ranked so that $w_1 > w_2 > ...w_n$ Each group i includes N_i individuals.

Consider first the utility of an irregular migrant: we assume that being an illegal worker affects negatively the utility. Usually, indeed, clandestine immigrants are charged higher rents, they find a difficult and costly accommodation, their mobility is restricted and they are constantly under the threath of apprehension and -possibly- deportation.

These difficulties are intrinsic to living in clandestinity, and they do not depend on the personal characteristichs of the immigrants. As a consequence, we can depict them with a fixed cost. On the other hand, irregular workers do not pay any tax on their income. Therefore, we write the expected utility U_C of an irregular immigrant as follows:

$$U_C = q(w_i - c) \qquad (i = 1, 2) \tag{1}$$

where $0 < q < 1$ is the probability of not being detected[1], w_i is the personal income, and c is the cost of clandestinity. The utility of being apprehended and deported is zero.

Legal immigrants are not subject to the cost of clandestinity, but they pay a flat tax $0 < t < 1$ on their income. The utility U_L of a legal immigrant is therefore

$$U_L = w_i(1 - t) \tag{2}$$

Finally, we assume that the utlty of being apprehended and expelled is zero.

[1] There are several empirical and theoretical reasons to think that q is close to unity. See the accurate discussion in Chau (2001) and the references quoted within. See also Hanson and Spilimbergo (2001); Hillman and Weiss (2001)).

Consider now the announcement of an amnesty for irregular workers. The timing of the game is as follows: 1) the government G announces an amnesty for the illegal workers; 2) the latter decide whether to apply for the regularization; 3) the government decides how many applicantions to accept. Successful immigrants pay taxes and are regularized; unsuccessful ones are repatriated.

If the announcement were credible, the condtion for a clandestine to show up would be

$$w_i(1-t) \geq q(w_i - c) \tag{3}$$

However, the government has an incentive to reoptimize once illegal immigrants show up.

On the other hand, the immigrants anticipate such an incentive and they only apply for the amnesty if the probability p_i of being regularized is sufficiently high. The incentive constraint becomes therefore $pw_i(1-t) \geq q(w_i - c)$, i.e.

$$p_i \geq \frac{q(w_i - c)}{w_i(1-t)} \equiv \bar{p}_i \tag{4}$$

Now that we have specified the behaviour of the immigrants, we turn to the first stage of the game.

2.2 The government's problem: ex-ante optimality

Consider a government interested in minimizing the population of immigrants and in maximizing the fiscal revenues. For a given stock of illegal workers, the government faces a trade off between deporting the illegal workers and increasing the tax base by granting an amnesty. We can write the utility of the government as follows:

$$G = t\sum_{i=1}^{n} w_i p_i L_i - \frac{\alpha}{2}\left[\sum_{i=1}^{n} p_i L_i\right]^2 - \frac{(1-\alpha)}{2}\sum_{i=1}^{n}\left[N_i - L_i\right]^2 \tag{5}$$

where

$L_i \leq N_i$ = immigrants who apply for the amnesty;
$t\sum_{i=1}^{n} w_i p_i L_i$ = amnesty's tax revenue;
$\sum_{i=1}^{n} p_i L_i$ = legalized immigrants;
$\sum_{i=1}^{n} [N_i - L_i]$ = immigrants who do not apply for the amnesty and stay illegal.

The weight $0 < \alpha < 1/2$ allows us to take into account the different disutility generated by legal and illegal immigration: for obvious reasons, legal immigrants create less concerns than the illegal ones[2]. Since the government has to maximize

[2] Notice that the use of a separable disutility does not affect our results. Since non-separability only complicates the algebra, we prefer to keep the model as simple as possible.

(5) subject to the I.C., it follows that $L_i = N_i \quad i = 1...n$; therefore we can rewrite the utility as[3]

$$G = t\sum_{i=1}^{n} w_i p_i N_i - \frac{\alpha}{2}\left[\sum_{i=1}^{n} p_i N_i\right]^2 \tag{6}$$

The problem of the government is then

$$\begin{aligned} \max_{p_1,\dots p_n} G &= t\sum_{i=1}^{n} p_i w_i N_i - \frac{\alpha}{2}[\sum_{i=1}^{n} p_i N_i]^2 \\ & \quad s.t. \\ p_i &\geq \bar{p}_i \\ \lambda_i(p_i - \bar{p}_i) &\geq 0; \\ p_i &\in [\bar{p}_i, 1] \qquad \text{for any } i \end{aligned} \tag{7}$$

The solution to the problem (7) is summarized in the following proposition:

Proposition 1 *(announced policies): there exists a group of immigrnats $i^* \in \{1, ...n\}$ such that the policies announced by the government are*

$$\begin{aligned} p_i^* &= 1 \quad \text{for} \quad i < i^*; \\ p_i^* &= \bar{p}_n \quad \text{for} \quad i > i^*; \\ p_{i^*}^* &= \min\{\hat{p}_{i^*}^*, 1\} \quad \text{if} \quad \hat{p}_{i^*}^* > \bar{p}_{i^*}; \\ p_{i^*}^* &= \bar{p}_{i^*} \quad \text{if} \quad \hat{p}_{i^*}^* \leq \bar{p}_{i^*} \end{aligned}$$

where $\hat{p}_{i^*}^* \equiv \frac{tw_{i^*} - \alpha\sum_{i \neq i^*} N_i}{\alpha N_{i^*}}$.

Proof. See the appendix. ■

The meaning of the proposition is intuitive once one recalls that immigrants are ranked with respect to their income w_i: the marginal utility generated by the richest groups of immigrants is always positive, therefore they are going to be entirely legalized. On the other hand, the marginal utility generated by the poorest immigrants is always negative, because their contribution to the tax base is negligible. As a consequence, the latter are offered their I.C. probability of being legalized.

The marginal group i^* is offered $p_{i^*}^* = \min\{\hat{p}_{i^*}^*, 1\}$ if $\hat{p}_{i^*}^* > \bar{p}_{i^*}$; otherwise it also receives its own I.C[4].

In short, the government announces $p_i^* > \bar{p}_i$ for all immigrants able to increase its marginal utility, and $p_i^* = \bar{p}_i$ for the others. It is straightforward to realize that there exists an incentive to deviate from the announcement $p_i^* = \bar{p}_i$, and deport the poorest applicants. We are going to examine the dynamically consistent solution in the next section.

[3] It is immediate to prove that the government cannot be better off better off when the I.C. does not hold for some i.

[4] $\hat{p}_{i^*}^*$ is obtained by solving $G_{i^*} = 0$.

2.3 Dynamic consistency

The dynamically consistent solution in the general case is quite intutitive: the government has no incentive to legalize the immigrants whose marginal contribution to its own utility is always negative Therefore, the poorest immigrants are not granted the amnesty and they are deported.

Proposition 2 *(time-consistent policies): the time-consistent values of p_i are*

$$\begin{aligned} p_i^{**} &= 1 \quad \textit{for} \quad i < i^*; \\ p_i^{**} &= 0 \quad \textit{for} \quad i > i^*; \\ p_{i^*}^{**} &= \min\{\hat{p}_{i^*}^*, 1\} \quad \textit{if} \quad \hat{p}_{i^*}^* > \bar{p}_{i^*}; \\ p_{i^*}^{**} &= 0 \quad \textit{if} \quad \hat{p}_{i^*}^* \leq \bar{p}_{i^*} \end{aligned}$$

Proof. See the appendix. ■

The amnesty, therefore, is credible only for the richest immigrants. Obviously in the Nash equilibrium the poorest anticipate the deportation and stay illegal.

The final result, as usual when there exist commitment problems, is that fiscal revenues are lower and the stock of illegals is greater with respect to the first best: the amnesty is unsuccessful in convincing the poorest immigrants to emerge.

The following step would be to explore the existence of a commitment technology able to restore the first best. As we argue in the following section, it is quite difficult that the game can be repeated at regular intervals, and therefore it is difficult to establish a reputation-based equilibrium.

This suggests making a more efficient use of immigration amnesties entails further difficulties. However, we are going to extend the model to a repeated game.

3 The timing of the amnesties

As we have explained in the Introduction, immigration amnesties are a recurrent phenomenon. Epstein and Weiss (2001) argue that there exist an optimal timing for an amnesty to occur. Notice that in Epstein and Weiss (2001) the income of the illegal workers is homogeneous. This assumption is crucial for such a result.

In this respect, our results are quite different from the conclusions of Epstein and Weiss (2001). Suppose for the moment being that p_i^* is unique. The intuition for the existence of an equilibrium is the following: when few immigrants are regularized, the benefit of increasing the fiscal base outweighs the cost of admitting more foreigners. The opposite occurs when the amnesty is granted to a large number of clandestines.

In equilibrium, the fiscal advantage for the government is [....]. The taxes a government can collect depend on how many immigrants are regularized and on their income w_i. Therefore, an amnesty occurs when the tax base is sufficiently high, and this requires either a large stock of illegals, or a high individual income, or both. As a consequence, the timing of the amnesties is determined by the joint evolution of these variables.

Therefore, unlike Epstein and Weiss (2001) we cannot determine an optimal timing of the amnesties, because even though a government has some control on the inflows of immigrants it cannot affect the evolution of illegal incomes.

Both inflows of immigrants and personal incomes are affected by shocks that are not under the control of the government (like the business cycle, the economic crises, the wars, the climate changes). Thus, in our framework, the timing of the amnesties cannot be a decision variable. Therefore, we can explore the possibility of repeating the game only in a stochastic context.

The observation that amnesties are frequent, but they occur at uneven time intervals, confirms this conclusion.

4 The repeated game

[to be written]

5 (Provisional) Conclusions

The aim of this paper was to shed some light on the fiscal motives for immigration amnesties. Our scope was, therefore, less general than the analysis of Epstein and Weiss (2001). In spite of that, the simplicity of our model helps to understand why immigration amnesties, though frequent, occur over uneven time intervals. In addition, our results suggest that amnesties are inherently provisional and sub-optimal: their timing is beyond the government's control and it is quite different to build a reputation-based mechanism..

References

[1] Chau N.H. (2001), Strategic Amnesty and Credible immigration Reform, Journal of Labor Economics 19 (3), 604-634.

[2] Epstein G., Weiss A. (2001), A Theory of Immigration Amnesties, IZA discussion paper n. 302.

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[4] Hillman A., L., Weiss A. (1999), A Theory of Permissible Illegal Immigration, European Journal of Political Economy, 15, 585-604.

[5] Krieger T., Minter S. (2007), Immigration Amnesties in the Southern EU Member States -A Challenge for the Entire EU? Working paper # 04, Center for International Economics.

[6] Weiss A., Hillman A. L., Epstein G.S., 1999. Creating illegal immigrants, Journal of Population Economics, Springer, vol. 12(1), pages 3-21.

A Appendix

Proof of Proposition 1 .

Consider the partial derivatives of (7):

$$\begin{aligned} G_1 &= tw_1N_1 - \alpha(\sum_i p_iN_i)N_1 \\ G_2 &= tw_2N_2 - \alpha(\sum_i p_iN_i)N_2 \\ &. \\ &. \\ &. \\ G_n &= tw_nN_n - \alpha(\sum_i p_iN_i)N_n \end{aligned}$$

And recall that we have ranked the groups of immigrants with respect to $w_i : w_1 > w_2 > ...w_n$.

To prove the proposition, it is crucial to remark that at most one derivative G_i can be equal to zero. Suppose for example that $G_1 = G_2 = 0$.

This implies $w_1N_1 = w_2N_2$ i.e. a contradiction. We want to prove now that $G_j = 0$ implies

$G_1, G_2, ...G_{j-1} > 0$ and $G_{j+1}, ...G_n < 0$.

Suppose $G_2 = 0$. Then, $\alpha(\sum_i p_iN_i) = tw_2$.

By substitution in G_1, we obtain $tw_1N_1 - tw_2N_1 > 0$. By substitution in G_3, we obtain $tw_3N_3 - tw_2N_3 < 0$.

To find the optimal p_i^* the government proceeds as follows: initially, it sets arbitrarily a $G_i = 0$, for example $G_n = 0$.

Since at most one derivative G_i can be equal to zero, this determines every p_i^* : we have

$$\begin{aligned} p_1^* &= p_2^* = ...p_{n-1}^* = 1; \\ p_n^* &= \min\left\{\frac{tw_n - \alpha\sum_{i=1}^{n-1} N_i}{\alpha N_n}, 1\right\} \quad \text{if} \quad \frac{tw_n - \alpha\sum_{i=1}^{n-1} N_i}{\alpha N_n} > \bar{p}_n; \\ p_n^* &= \bar{p}_n \quad \text{if} \quad \frac{tw_n - \alpha\sum_{i=1}^{n-1} N_i}{\alpha N_n} \leq \bar{p}_n. \end{aligned}$$

the government sets then $G_{n-1} = 0$; $G_{n-2} = 0....G_1 = 0$ and compares the respective utilities. Obviously, this procedure allows the government to choose which G_i must be equalized to zero in order to maximize its utility. Let this G_i

be G_{i^*}. Then the solutions are the following:

$$
\begin{aligned}
p_i^* &= 1 \quad \text{for} \quad i < i^*; \\
p_i^* &= \bar{p}_n \quad \text{for} \quad i > i^*; \\
p_{i^*}^* &= \min\left\{\frac{tw_{i^*} - \alpha \sum_{i \neq i^*} N_i}{\alpha N_{i^*}}, 1\right\} \quad \text{if} \quad \frac{tw_{i^*} - \alpha \sum_{i \neq i^*} N_i}{\alpha N_{i^*}} > \bar{p}_{i^*}; \\
p_{i^*}^* &= \bar{p}_{i^*} \quad \text{if} \quad \frac{tw_{i^*} - \alpha \sum_{i \neq i^*} N_i}{\alpha N_{i^*}} \leq \bar{p}_{i^*}
\end{aligned}
$$

Proof of Proposition 2: Sub-optimality.
-Straightforward-