Minimum wages and the creation of illegal migration[1]

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Abstract

In this paper, we explore employers' decisions regarding the employment of legal and illegal immigrants in the presence of endogenous adjustment cost, minimum wages and an enforcement budget. We show that increasing the employment of legal foreign workers will increase the number of illegal immigrants which will replace the employment of the local population and thus creating illegal migration.

Keywords: illegal immigration, foreign worker, minimum wages.

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1. Introduction

The literature on the importance of social networks in the immigrant assimilation process is well-established (Chiswick and Miller, 2005; Epstein and Gang, 2006; Bauer et al., 2007). However, little is known about the illegal (or undocumented) immigrants' social networks: Epstein (2003) concluded that illegal immigrants are inclined to use social networks created by previous immigrants more than legal immigrants. The reason is that illegal immigrants are subject to apprehension and deportation by the authorities, and therefore cannot find jobs as easily as legal immigrants. Faria and Levy (2003) deduced that high skilled immigrants form social networks, in the host country, which facilitate subsequent illegal immigration. Using a dataset of undocumented Mexican migrants to the United States, Dolfin and Genicot (2010) examined the effect of social networks on illegal immigrant decisions to enter alone or with the help of a border smuggler ("coyote"). They discovered that larger family networks encourage the use of these smugglers. Devillanova (2008) found that in Italy, strong social ties increase health care use by undocumented immigrants.

Table 1 presents the fifteen states with the highest illegal alien populations, the illegal alien population in absolute numbers and as a share of population. It is easy to see that there is a positive relationship between the number of legal and illegal immigrants. For example, California leads the list of states with the highest illegal alien populations as well as those with the highest legal aliens. With regard to Texas, Florida and New York head both lists, whereas Colorado and Nevada are located at the end of both lists.

Epstein and Heizler (2008) examined employers’ decisions regarding the number of employed legal and illegal immigrants, assuming a constant immigrant adjustment cost and a minimum wage scale. Minimum wages play an essential role since they put limits on local workers' and legal migrants' wages. Thus, under certain circumstances, the probability of employing illegal workers is increased. The main goal of this paper is to shed light on the relationship between the number of legal and illegal migrants. We consider a model with a minimum wage scale and show that, as the number of legal immigrants increase, the cost for illegal migrants to enter the country decreases and the capital owners’ incentive of to employ those illegal immigrants increases. Thus, as the number of legal permits increases, we see more illegal migrants in the economy.[2]

Table 1 –

The relationship between legal and illegal migration in various states

State	Ranking by number of illegal immigrants	Illegal alien population (thousands	Ilegal immigrant share of population	Ranking by number of legal immigrants	Legal alien population (thousands	Legal immigrant share of population
California	1	2840	8%	1	7303	21%
Texas	2	1702	7%	4	1702	7%
Florida	3	1012	6%	3	2478	15%
Arizona	4	579	9%	12	312	5%
New York	5	552	3%	2	3694	20%
Georgia	6	504	5%	11	447	4%
Illinois	7	480	4%	6	1234	10%
New Jersey	8	429	5%	5	1436	17%
North California	9	363	4%	15	263	3%
Washington	10	277	4%	10	452	7%
Maryland	11	268	5%	9	456	9%
Virginia	12	259	3%	8	604	7%
Massachuesetts	13	220	3%	7	660	9%
Colorado	14	170	4%	14	266	6%
Nevada	15	160	6%	13	297	11%

Source: Center of Immigration Studies

2. Employers' and Workers' Decisions

[2]A similar relationship, between legal and illegal migration, was presented by Epstein et al. (1999), in a model of contracted temporary migration under which migrants enter the economy legally and have an incentive to overstay their visit even though illegally.

2.1. The employer's decision

Similar to Epstein and Heizler (2008), we consider a small open and competitive economy where the employers are risk-neutral and may employ local unskilled workers, L_L, legal foreign workers, L_F, or illegal foreign workers, I. The illegal workers are perfect substitutes for the legal workers. To protect local workers, the government establishes a *minimum wage*, w_M (which is higher than the wage requested by foreign workers and lower than, or equivalent to, the equilibrium wage of a closed economy) for all workers. Moreover *immigration law* forbids employing foreign workers who lack work permits. It is also assumed that illegal workers' wages, w_I, are lower than the wage earned by legal workers, w_M (below we will determine the foreign illegal worker's equilibrium wage, w_I). It should be emphasized that, in our model, the employer pays a wage which is lower than minimum wage only to illegal immigrants.[3] When an illegal worker is apprehended, he or she is expelled from the country, while sanctions are implemented against the employer. It is assumed that there are M identical employers in the economy and each is relatively small having no affect on the economy.

As in Epstein and Heizler (2008), it is also assumed that an employer who employs illegal immigrants may be detected and punished with probability p. The policy-maker can regulate the probability of detection, p, by an (internal) enforcement budget, E, i.e. $p(E)$ such that $p'(E) > 0, p''(E) < 0$. The penalty for employing illegal workers depends on the number of illegal immigrants, $\theta(I)$, such that $\theta(0) = 0$ and $\theta'(I) > 0, \theta''(I) > 0$.[4] At the beginning of each period, the employer decides on the number of legal and illegal workers to be employed.

The representative employer's expected profit is given by:

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[3]In fact, there are some local workers who are willing to work for a wage similar to that of the illegal workers. The employer prefers to pay a lower than minimum wage to the illegal foreign workers, because they are in the country illegally, and are therefore afraid to complain about their employers to the authorities.

[4] Indeed, in many countries, the fine is constant for each employee, but when marginal production decreases, then the apprehension of a worker increases the costs to the employer in a non-linear way. In addition, the financial cost of the fine (for instance, the marginal interest) increases as the total fine increases.

$$E\left(\Pi_E\right) = VF(N) - \left(L_L + L_F\right)w_M - Iw_I - p\left(E\right)\theta(I) \quad (1)$$

s.t.

$$N = L_L + L_F + I \quad (2)$$

where N is the number of unskilled workers, $F(N)$ is the production function, which satisfies $F'(N) > 0, F''(N) < 0$, and V is the product price.

The representative employer determines the optimal number of workers and illegal immigrants. Therefore in equilibrium the employer's decision becomes:

$$E(\prod_E) = VF(L_L + L_F + I) - (L_L + L_F)w_M - Iw_I - p(E)\theta(I) \quad (1')$$

Since the firm is relatively small, it takes wages as given and has no affect on them. The first order conditions to determine the number of illegal migrants, legal migrants and local workers is given by:

$$\frac{\partial E(\prod_E)}{\partial L_L} = VF' - w_M = 0 \quad \Rightarrow \quad VF' = w_M \quad (3)$$

$$\frac{\partial E(\prod_E)}{\partial L_F} = VF' - w_M = 0 \quad \Rightarrow \quad VF' = w_M \quad (4)$$

$$\frac{\partial E(\prod_E)}{\partial I} = VF' - w_I - p\theta'(I) = 0 \quad \Rightarrow \quad VF' = w_I + p\theta'(I) \quad (5)$$

Where

$$F' = \frac{\partial F(N)}{\partial N} = \frac{\partial F(L_L + L_F + I)}{\partial L_L} = \frac{\partial F(L_L + L_F + I)}{\partial L_F} = \frac{\partial F(L_L + L_F + I)}{\partial I}, \ and\ \theta'(I) = \frac{\partial \theta}{\partial I}.$$

Thus, since the minimum wage is given to the firm, $w_{M,}$, we obtain that the constraint which faces the firm is:

$$\frac{\partial E(\prod_E)}{\partial I} = w_M - w_I - p\theta'(I) = 0 \quad (6)$$

Denote the optimal number of illegal immigrants (which satisfies equation 6) by I^*. At equilibrium, all of the employers behave like the representative employer. Thus, the number of illegal immigrants in the host country equals I^* multiplied by the number of firms (employers) in the economy, M .

2.2. The illegal immigrants' decisions

All of the immigrants, legal and illegal, are motivated by the earnings in the destination country relative to that in the source country and the costs of migration. These latter costs include the adjustment cost which stems from living in an unfamiliar environment and moving costs (see, for example, Chiswick, 1999; Levine, 1999). However, the illegal immigrant is subject to potential apprehension and deportation by the authorities and thus takes into consideration additional costs: the probability of being apprehended and deported, as well the equilibrium wage. Following Todaro and Maruszko (1987) and others, it is assumed that the wage in the destination country is higher than the wage in the source country, and that immigrants face adjustment costs and potential costs of apprehension. The potential immigrant will therefore agree to immigrate illegally if the wage received in the destination country, w_I, is higher than the wage in the source country, w_H, including the penalty (and losing income) if he/she is apprehended, $p\lambda$, and the adjustment costs (or moving costs) in the host country, c. The total number of legal immigrants is given by ML_F and the number of illegal immigrants is given by $(1-p)MI$ (since there is a probability of detection and thus deportation of *p and M* is the number of firms in the economy).

The adjustment costs may consist of a fixed cost and an additional cost which depends negatively on the size of the minority group (see, Carrington et al., 1996; Bauer et al., 2007). Namely, as the number of immigrants (both legal immigrants, L_L and illegal immigrants, I) in the host country increases, the adjustment cost decreases.
The adjustment costs can be written as follows:

$$c = c\big(ML_F + M(1-p)I\big) = c\big(M\big(L_F + (1-p)I\big)\big) \tag{7}$$

where c is a function of the number of immigrants and it holds that $\frac{\partial c}{\partial(M(L_F + (1-p)I))} < 0$. For example, $c = c_0 + c_1 * (ML_F + M(1-p)\,I)$ while c_0, a fixed cost for moving, satisfies $c_0 > 0$ and c_1<0.

The employer pays the illegal immigrants the lowest wage they are willing to accept. Thus, the illegal immigrants' wage satisfies:

$$w_I = w_H + c + p\lambda \tag{8}$$

Note that this condition is written in terms of one period of time.[5]

3. Equilibrium

In our equilibrium, the enforcement budget is fixed and the wage earned by the illegal migrants is a function of the number migrants in the economy. The single employer *does not* take this into consideration since he is one out of many firms. However, in equilibrium it has an effect on the outcome. Plugging in (7) and (8) into (6) we obtain that the first order condition of the representative employer equals:

$$\frac{\partial E(\Pi_E)}{\partial I} = w_M - (w_H + c + p\lambda) - p\theta'(I) = 0 \tag{9}$$

Let us now examine how, in equilibrium a change in the number of legal immigrants affects I^*. Note, that in order to do this we take into consideration the first order condition of the employer together with the reaction of the illegal immigrants.

[5] For simplicity, we ignore the one-time moving cost. But it can be assumed that this cost is divided over the whole period.

Since $\frac{dI^*}{dL_F} = -\frac{\frac{d^2E(\Pi_E)}{dIdL_F}}{\frac{d^2E(\Pi_E)}{dI^2}}$ and by the second order condition of the employer: $\frac{d^2E(\Pi_E)}{dI^2} = -p\theta''(I) < 0$, It can be verified that:

$$Sign\left(\frac{dI^*}{dL_F}\right) = Sign\left(\frac{d^2E(\Pi_E)}{dIdL_F}\right) \tag{10}$$

In equilibrium, we take into consideration the effect the number of legal immigrants has on the illegal immigrant. The local worker does not take this into consideration since each firm is an individual firm and is small relative to the market, however in equilibrium it has an effect on the total outcome. Thus, from equations (9), and (10), we obtain that in equilibrium:

$$Sign\left(\frac{dI^*}{dL_F}\right) = -\frac{dc\left(ML_F + M(1-p)I\right)}{dL_F} > 0 \tag{11}$$

Thus, a positive relationship exists between the stock of foreign legal immigrants and the optimal quantity of illegal immigrants. As the number of legal immigrants increases, the adjustment cost of the illegal migrants decreases and the number of illegal migrants entering the economy increases.

Thus, **for a given enforcement budget**, *E, in this setting, increasing the population of legal migrants will increase the number of illegal migrants wishing to enter into the economy*. These immigrants will be employed instead of the local population, increasing unemployment.

It should be noted that if the employer is a monopsony, then he or she takes into account the effect of his/her decision on equilibrium. In this case, the employer may prefer employing legal immigrants instead of natives. Employing legal immigrants will create ethnic social networks which will enable him/her to employ more illegal immigrants.

The result regarding the positive relationship between the number of legal and illegal immigrants has policy implications. In the case where a government (regulator) wishes to decrease illegal migrants it can decrease the permits for legal immigrants. However, if it wishes to increase the employment of legal immigrants then increasing the number of permits for legal immigrants it should understand that such an increase will bring about an increase in illegal immigrants. The government (regulator) can determine the following steps to curtail the increase in illegal immigrants: The enforcement budget can be increased thus increasing the number of illegal migrants apprehended and deported. Second, it can increase the penalty of for employing illegal immigrants and by doing so increase the cost of employing illegal migrants. Finally, it can decrease the minimum wage in the economy. Decreasing the minimum wage will decrease the demand for illegal migrants and decrease the employment of the illegal migrants and the willingness of the migrants to enter the host country.

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