An Approach to the Positive Political Economy of Illegal Migration

Douglas R. Nelson

Murphy Institute of Political Economy
Tulane University
New Orleans, LA 70118, USA

and

Leverhulme Centre for Research on Globalisation and Economic Policy
School of Economics
University of Nottingham
Nottingham, NG7 2RD
UK

Yongsheng Xu

Department of Economics
Andrew Young School of Policy Studies
Georgia State University
Atlanta, Georgia 30303

An Approach to the Positive Political Economy of Illegal Migration

Abstract

This paper develops three simple models of the endogenous determination of immigration policy. The first section develops a model, based on Ethier (*AER*, 1986), of international migration and unemployment in a one good model with a minimum wage and random job assignment. As in the existing literature on illegal migration, anti-immigration enforcement effort and unemployment are shown to be inversely related. In the first of the endogenous policy models, politically active capital lobbies for reduced enforcement effort in the context of a government with a negative preference for unemployment. In the second model, capital and labor lobby a passive register government to determine the level of enforcement effort. In the first two models government enforcement effort is taken to be costless. The third political economy model reverts to the case of politically inactive labor to consider the effect of resource-using enforcement effort.

Journal of Economic Literature classification: F22

An Approach to the Positive Political Economy of Illegal Immigration

Even the most casual reading of the press makes it clear that immigration, and illegal immigration in particular, is a topic of considerable political importance. Illegal immigration is a major electoral issue throughout the southwestern United States and a matter of national political concern in Australia, Taiwan, Japan and many European countries. While it is unquestionably the case that non-economic considerations, and racism in particular, account for much of the prominence and violence surrounding this issue in all of these countries, it is also the case that there are fundamental economic foundations supporting the politics as well. In this paper we take some first steps toward integrating illegal immigration into the main line of research on the endogenous determination of international economic policy.

We build on the important recent work of Ethier (1986) who develops a sophisticated analysis of the economics of illegal migration. In that paper, Ethier is interested in characterizing and evaluating the interaction between border enforcement and internal enforcement under a variety of assumptions about the capacity of firms to identify the nationality/legality of a potential worker. Bond and Chen (1987) extend the Ethier model to solve for the two-country equilibrium under both international capital immobility (the Ethier case) and international capital mobility. Since our goal is to explicitly endogenize the level of enforcement, we work with a simplified version of the model in which capital is internationally immobile and, as in Bond and Chen, there is only internal enforcement and firms can distinguish between legal and illegal workers with certainty. A recent paper by Djaji (1987) presents an analysis of illegal migration suggesting that endogenizing the level of enforcement along the lines used in endogenous tariff theory would be useful, though that paper does not present such an analysis. The goal of the present paper is to provide such an analysis.[1]

---

[1]We should note the recent paper by Shughart, Tollison, and Kimenyi (1986)that takes a regulation-theoretic approach to the analysis of immigration policy. Building on the insights of Peltzman (1976), the authors study the empirical relationship between business cycle variables and level of enforcement effort. While our analysis is comparative static, the presence of such business cycle effects suggests interesting extensions for future work. Also

The first section of this paper develops a model, based on Ethier (*AER*, 1986), of international migration and unemployment in a one good model with a minimum wage and random job assignment. As in the existing literature on illegal migration, anti-immigration enforcement effort and unemployment are shown to be inversely related. The remainder of the paper develops three simple models that endogenize the level of enforcement activity. In the first of the endogenous policy models, politically active capital lobbies for reduced enforcement effort in the context of a government with a negative preference for unemployment. In the second model, capital and labor lobby a passive register government to determine the level of enforcement effort. In the first two models government enforcement effort is taken to be costless. The third political economy model reverts to the case of politically inactive labor to consider the effect of resource-using enforcement effort.

I. A Simple Two-Country Model of Migration and Unemployment

In this section we develop a simple two-country model of illegal immigration. Consider a world consisting of two countries, both engaged in the production of a single homogeneous product. Output is produced under perfectly competitive conditions, with capital and labor according to a constant returns to scale technology.[2] Technologies are allowed to differ between countries. The labeling of countries is chosen so that in the absence of factor mobility, the Home wage rate at full employment exceeds the Foreign wage rate. The output good is chosen to be the numeraire in the analysis. While capital is assumed to be internationally immobile, labor is taken to be internationally mobile. This situation is easily illustrated in figure 1, which shows the Foreign (L*l) and Home (lL) labor endowments on the horizontal axis and the Foreign and Home value marginal products on the vertical axes. With migration, l'l Foreign labor moves to the Home country, world output rises by the triangle ABC, the wage of Foreign workers rises

see Chiswick (1988) and Reynolds and McCleery (1988) for recent, policy-oriented, discussions of illegal migration with particular reference to the (Simpson-Rondino) Immigration Reform and Control Act of 1986.

[2]Specifically, we assume that the technology is linear homogeneous, twice differentiable, and strictly quasiconcave.

from ω to ω', and the wage of Home workers falls from w to w' (note that ω' = w'). It is easy to see that the Foreign workers' gain is given by ωω'DB and the loss of Home workers by ww'DA. Similarly, the gain to Home capital is given by wACw' and the loss to Foreign capital by ωBCω'.

--Figure's 1 and 2 about here--

Now we suppose that the Home government sets a minimum wage at $\overline{w}$. With migration we adopt the standard Harris-Todaro (1970) assumption that risk neutral workers will seek employment in the Home country until the expected wage in the Home country is equal to the Foreign wage. Following Corden and Findlay (1975), we can illustrate this equilibrium. Suppose for ease of presentation that the minimum wage is set at the pre-migration market wage. Corden and Findlay show that the intersection of a rectangular hyperbola through the point (A) where the minimum wage is equal to the Home value marginal product and B on the Foreign value marginal product curve identifies the equilibrium level of unemployment (l'l).[3] In this case we see that world output falls by BCD.[4] In terms of figure 2, there are Ll workers employed in the Home country and l'l workers unemployed. Given the random job assignment characteristic of the Harris-Todaro model, a Home worker's probability of getting a Home job is the same as that of a Foreign worker. That is, with free migration there is one labor market and two productive sectors, in one of which there is a minimum wage. This is, of course, the Harris-Todaro model. The returns to Home capital are unchanged, while the return to Foreign capital falls by ω'BCω, and the expected wage of Foreign labor rises, while that of Home labor falls. Note that, since Home capital's welfare is unchanged while Home labor experiences a fall in

---

[3] We can write the expected wage $w^E = \rho\overline{w} + (1-\rho)0,$ where $\rho\ (0 \le \rho \le 1)$ is the probability of being employed in the Home country. Letting $\overline{L}$ be total labor in the Home country (i.e. both employed and unemployed—this is Ll′ in the diagram) and L_M be total employed labor, if we assume that the probability weight used by potential migrants is given by $L_M / \overline{L},$ then in equilibrium $\omega = w^E = (L_M / \overline{L})\overline{w}.$ It should be clear that the graph of this relationship in the diagram developed in the main text is a rectangular hyperbola. This graph is anchored on point A because the Home capitalists hire labor to the point at which the minimum wage is equal to labor's value marginal product.

[4]Output in the Home country is unchanged since, by assumption the minimum wage is fixed at the initial wage and output in the Foreign country falls as Foreign labor migrates to the Home country in search of higher wages.

welfare, total welfare of Home citizens must fall as a result of the minimum wage with migration.

Now suppose that illegal migrants are willing to work in the Home country at below the minimum wage but are subject to deportation (without collecting their wage) if they are caught, and firms employing illegal migrants are subject to a penalty. Home workers, however, are unable to work for less than the minimum wage. Thus, consider the problem of a representative Home firm with a fixed stock of capital that seeks to maximize profits. Although legal and illegal labor are perfect substitutes in production, the firm pays a fine of k, taken to be exogenous, if it is caught employing illegal workers. Let I and L be the number of illegal workers and legal workers, respectively, employed by the firm, and let $\overline{I}$ and $\overline{L}$ be the total number of illegal and legal workers in the Home economy. We represent the Home government's enforcement efforts by the function $\alpha q\left(I,\overline{I}\right)$ where α represents the level of enforcement effort and $q\left(I,\overline{I}\right)$ captures the effect of the level of illegal employment on the probability of detection. In this paper, we take a simple, specific from of $q\left(I,\overline{I}\right)=\frac{I^2}{\overline{I}^2}$. Hence, the probability of government inspection and illegal workers being caught is $\alpha\frac{I^2}{\overline{I}^2}$. Then, since capital is fixed and illegal workers and legal workers are perfect substitutes in the production process, we can write the firm's output as: $f\left(I+L\right)$. Letting π denote the firm's profit:

$$\pi = f\left(I+L\right)-\overline{w}L-w^*I-k\alpha\frac{I^2}{\overline{I}^2}.$$

The firm seeks to maximize the value of this expression through its choice of (L,I). As a first approach, we will fix α at α_0. Thus, the firm's behavior can be summarized by the first-order conditions:

$$\begin{aligned} f'\left(I+L\right)-w^*-\frac{2k\alpha_0 I}{\overline{I}^2}&=0 \\ f'\left(I+L\right)-\overline{w}&=0. \end{aligned} \tag{1.1}$$

It can be checked that the second-order condition holds. Let (I_0, L_0) be the solution to equations (1).

We can use the economic system described by equations (1) to determine the preferences of Home capital-owning and Home labor-owning households with respect to the two policy instruments: the level of fine imposed for hiring illegal migrants (k) and the level of enforcement effort (α_0). These preferences indicate whether, in the absence of costs of political actions and holding the values of other variables constant, a particular group would benefit from an increase or decrease in the level of a particular policy instrument.

Assuming that we can represent all Home agents' welfare by the indirect utility function $U_i = V^i (p,y_i)$, $i = K$ or L, where p is the relative price and y_i is the income of individuals with factor ownership i. Since p is fixed by our choice of numeraire, $V(\bullet)$ depends only on factor income. Let π_0 denote the maximum profit of the firm. Then the welfare of the capital-owning household is measured by π_0. Let R_0 denote the Home workers' expected total welfare. Then $R_0 = \bar{w}L_0 \frac{I_0 + L_0}{\bar{I} + \bar{L}}$.

Starting with the the level of enforcement effort α_0, comparative static analysis of the system yields the following results:

$$
\begin{aligned}
&\frac{\partial I_0}{\partial \alpha_0} = -\frac{I_0}{\alpha_0} < 0;\\
&\frac{\partial L_0}{\partial \alpha_0} = \frac{I_0}{\alpha_0} > 0;\\
&\frac{\partial \pi_0}{\partial \alpha_0} = -\frac{kI_0^2}{\bar{I}^2} < 0;\\
&\frac{\partial R_0}{\partial \alpha_0} = \left(I_0 + L_0\right)\frac{\bar{w}}{\bar{I} + \bar{L}}\frac{I_0}{\alpha_0} > 0.
\end{aligned}
\tag{1.2}
$$

The first two results obtain because enhanced enforcement raises the marginal cost of illegal workers and reduces the marginal cost of legal workers, inducing a reallocation of labor from the illegal to the legal workers. This reallocation results in no changes in the total number of employed workers since the total number of employed workers is determined by the minimum wage-- $\overline{w}$. The last two results show that, in the absence of costs of enforcement effort, capital owners favor weakened enforcement effort while Home workers favor increased effort.

Comparative static analysis with respect to the level of the fine, unsurprisingly, yields essentially the same results:

$$\begin{aligned} \frac{\partial I_0}{\partial k} &= -\frac{I_0}{k} < 0; \\ \frac{\partial L_0}{\partial k} &= \frac{I_0}{k} > 0; \\ \frac{\partial \pi_0}{\partial k} &= -\frac{\alpha_0 I_0^2}{\overline{I}^2} < 0; \\ \frac{\partial R_0}{\partial k} &= \left(I_0 + L_0\right)\frac{\overline{w}}{\overline{I}+\overline{L}}\frac{I_0}{k} > 0. \end{aligned} \tag{1.3}$$

Thus, the first two results show that an increase in the fine, k, will cause capital to hire fewer illegal workers and more legal workers, although it has no effect on the total number of workers employed since, again, this is determined by the minimum wage. The last two results show that, in the absence of costs of pursuing such a policy, the capital owners prefer to decrease the fine, while Home labor prefers to increase it.

II. Political Activity in a Model with Illegal Immigrants

Having characterized the policy preferences of Home capital- and labor-owners in the absence of costly political action, we now present three simple models of the political-economy of immigration enforcement that explicitly incorporate costly political action. In the first model, costless government enforcement effort is determined by exogenous resistance to unemployment and lobbying by capital only. In the second model, costless enforcement effort is determined by competitive lobbying by Home labor and capital. In the third model we return to K-only lobbying but incorporate costly enforcement.

A. Firm Political Activity when the Government has a Preference for Low Unemployment

Suppose that one of the Home government's objectives is to maintain full employment of Home labor. From the previous section we know that as enforcement effort increases, more Home workers will be hired by the firm, hence increasing the employment rate of Home labor, raising the cost of production and lowering the return to Home capital. As a result, Home capitalists prefer weak enforcement of the immigration law (a low α). Thus, Home capitalists will invest resources in an attempt to reduce the government's enforcement effort. However, the worse is the unemployment of Home labor, the more resistant to capital's lobbying is the government. That is, if we let E_K be the resources used by the capital owners to influence α, and write $\alpha\left(E_K, \overline{L}-L\right)$, then $\frac{\partial \alpha}{\partial E_K} < 0$ and $\frac{\partial \alpha}{\partial L} < 0$.

Given the political channel for generating a return, the firm's problem is now

$$\max_{I,L,E_K} f\left(I+L\right) - \overline{w}L - w^* I - k\alpha\left(E_K, \overline{L}-L\right)\frac{I^2}{\overline{I}^2} - E_K.$$

That is, the firm treats the government’s reaction to unemployment as a constraint in choosing its political-economic strategy. Now the firm's behavior is summarized by the following first-order conditions:

$$\begin{aligned} f'\left(I+L\right) - w^* - \frac{2k\alpha I}{\overline{I}^2} &= 0; \\ f'\left(I+L\right) - \overline{w} - k\frac{\partial \alpha}{\partial L}\frac{I^2}{\overline{I}^2} &= 0; \\ k\frac{\partial \alpha}{\partial E_K}\frac{I^2}{\overline{I}^2} + 1 &= 0. \end{aligned} \tag{1.4}$$

Let (I_1, L_1, E_{K1}) be the solution to the system of equations in (4), and let $\alpha_1 = \alpha\left(E_{K1}, \overline{L}-L_1\right)$.

From the second of these conditions we have:

$$\begin{aligned} \overline{w} &= f'\left(I_1+L_1\right) - k\frac{\partial \alpha}{\partial L}\frac{I^2}{\overline{I}^2} \\ &> f'\left(I_1+L_1\right), \text{ since } \frac{\partial \alpha}{\partial L} < 0. \end{aligned}$$

From the second first-order condition in (1.1) we have $\overline{w} = f'(I_0 + L_0)$, therefore, $f'(I_0 + L_0) > f'(I_1 + L_1)$. Recalling that $f'' < 0$, we have $I_0 + L_0 < I_1 + L_1$.

Notice from the first two conditions in (1.4) that we can obtain

$$\begin{aligned}\overline{w} - w^* &= \frac{2k\alpha_1 I_1}{\overline{I}^2} - k\frac{\partial \alpha}{\partial L}\frac{I^2}{\overline{I}^2} \\ &> \frac{2k\alpha_1 I_1}{\overline{I}^2}, \text{ since } \frac{\partial \alpha}{\partial L} < 0,\end{aligned}$$

and, from the conditions in (1.1), we have

$$\overline{w} - w^* = \frac{2k\alpha_0 I_0}{\overline{I}^2}.$$

Therefor, we conclude that

$$\frac{2k\alpha_0 I_0}{\overline{I}^2} > \frac{2k\alpha_1 I_1}{\overline{I}^2}.$$

or

$$\alpha_0 I_0 > \alpha_1 I_1.$$

We collect collect these results in the following theorem

Theorem 1.

(1.1) $I_0 + L_0 < I_1 + L_1$,

(1.2) If $\alpha_1 \geq \alpha_0$, then $I_1 < I_0$, and if $I_1 \geq I_0$, then $\alpha_1 < \alpha_0$.

That is, the total number of workers hired by the firm when α is endogenously determined by E_{K1} and $\overline{L} - L_1$ exceeds the total number of workers hired by the firm when α is fixed at α_0. Furthermore, if the firm is not successful in reducing the government's enforcement effort below α_0, then the firm will hire less illegal workers, while hiring more illegal workers means that the firm has been successful in reducing the enforcement effort below α_0.

B. Political Competition between Capital and Labor to Determine the Level of Enforcement

We showed in section I that both capital- and labor-owners have an incentive to engage in political activities to influence the government's enforcement effort. In this section we permit both factors to be politically active. That is, we represent the political-economic competition between capital and labor as a game with the following timing: in the first period, capital-owners and labor-owners expend real resources on lobbying; then, in the second period, firms choose levels of home and illegal workers to maximize profit based on the optimal levels of lobbying resources chosen in the first period. Thus, the relevant equilibrium concept is subgame perfection.

Again we let E_K denote the resource used by capital owners and EL the political resources used by labor owners. Now, following the standard practice in endogenous tariff theory (e.g. Findlay and Wellisz, 1982), we assume that α is a function of E_K and E_L, with $\frac{\partial \alpha}{\partial E_K} < 0$ and $\frac{\partial \alpha}{\partial E_L} > 0$. We can represent the firm's problem in terms of two sub-problems: first, the firm chooses L and I for given levels of E_K and E_L; and then the firm chooses E_K for any given level of E_L to maximize expected profits. That is,

Problem I:

$$\max_{I,L} \pi\left(I,L;E_K,E_L\right) = f\left(I+L\right) - \overline{w}L - w^* I - k\alpha\left(E_K,E_L\right)\frac{I^2}{\overline{I}^2} - E_K.$$

Then letting $\overline{\pi}\left(E_K,E_L\right) = \max_{I,L} \pi\left(I,L;E_K,E_L\right)$, we can write

Problem II:

$$\max_{E_K} \overline{\pi}\left(E_K,E_L\right), \text{ s.t. } \left\{I,L\right\} \in \arg\max\left\{\text{Problem 1}\right\}.$$

The first-order conditions for Problem I are:

$$\begin{aligned} f'\left(I+L\right) - w^* - \frac{2k\alpha I}{\overline{I}^2} &= 0; \\ f'\left(I+L\right) - \overline{w} &= 0. \end{aligned} \tag{1.5}$$

Recognizing that

$$\frac{\partial I}{\partial E_K} = -\frac{\partial L}{\partial E_K} = -\frac{I}{\alpha}\frac{\partial \alpha}{\partial E_K}$$
$$\frac{\partial I}{\partial E_L} = -\frac{\partial L}{\partial E_L} = -\frac{I}{\alpha}\frac{\partial \alpha}{\partial E_L} \tag{1.6}$$

the first-order conditions for Problem II can be written as

$$1 + k\frac{I^2}{\overline{I}^2}\frac{\partial \alpha}{\partial E_K} = 0. \tag{1.7}$$

Equation (1.7) also implicitly defines the firm's reaction function $E_K(E_L)$. The second-order condition for Problem II requires $\frac{2}{\alpha}\left(\frac{\partial \alpha}{\partial E_K}\right)^2 < \frac{\partial^2 \alpha}{\partial E_K^2}$. In this section, we assume that this second-order condition holds.

For Home labor, the problem is to choose EL to maximize expected total welfare, less the resources use to influence the enforcement effort:

Problem L:
$$\max_{E_L}\ \overline{w}L\frac{I+L}{\overline{I}+\overline{L}} - E_L,\ \text{s.t. } \{I, L\} \in \arg\max\{\text{Problem 1}\}.$$

The first-order condition for Problem L is:

$$\frac{I}{\alpha}\overline{w}\frac{I+L}{\overline{I}+\overline{L}}\frac{\partial \alpha}{\partial E_L} - 1 = 0. \tag{1.8}$$

Like equation (1.7), equation (1.8) implicitly defines Home labor's reaction function $E_L(E_C)$. The second-order condition for Home labor's problem is satisfied if $\frac{\partial^2 \alpha}{\partial E_L^2} < \frac{2}{\alpha}\left(\frac{\partial \alpha}{\partial E_L}\right)^2$. Using this information about the two reaction functions we obtain the following two results.

Theorem 2. There exist E_K* and E_L* such that equations (7) and (8) are satisfied.

Proof. From equation (7), the slope of capital's reaction function is:

$$\left.\frac{dE_K}{dE_L}\right|_K = \frac{-\frac{2}{\alpha}\frac{\partial\alpha}{\partial E_K}\frac{\partial\alpha}{\partial E_L}+\frac{\partial^2\alpha}{\partial E_K \partial E_L}}{\frac{2}{\alpha}\left(\frac{\partial\alpha}{\partial E_K}\right)^2-\frac{\partial^2\alpha}{\partial E_K^2}},$$

and from equation (8), the slope of labor's reaction function is:

$$\left.\frac{dE_K}{dE_L}\right|_L = \frac{-\frac{2}{\alpha}\left(\frac{\partial\alpha}{\partial E_L}\right)^2+\frac{\partial^2\alpha}{\partial E_L^2}}{\frac{2}{\alpha}\frac{\partial\alpha}{\partial E_K}\frac{\partial\alpha}{\partial E_L}-\frac{\partial^2\alpha}{\partial E_K \partial E_L}}.$$

Given the second-order conditions, it is clear that

$$\left.\frac{dE_K}{dE_L}\right|_K \times \left.\frac{dE_K}{dE_L}\right|_L < 0.$$

Therefor, either (1) $\left.\frac{dE_K}{dE_L}\right|_K > 0$ and $\left.\frac{dE_K}{dE_L}\right|_L < 0$, or (2) $\left.\frac{dE_K}{dE_L}\right|_K < 0$ and $\left.\frac{dE_K}{dE_L}\right|_L > 0$.

Consider case (1): Let $E_K^{\max}$ be such that $E_L\left(E_K^{\max}\right)=0$ and let $E_K^{opt} = E_K\left(0\right)$. That is, $E_K^{\max}$ is the quantity of political resources used by capital that eliminates Home labor's influence on the enforcement effort, and E_K^{opt} is the optimal allocation of political resources by capital when Home labor uses no resources politically. Clearly, $E_K^{\max} > E_K^{opt}$. Then, given the shapes of the two reaction functions, there exists a pair (E_K*,E_L*) at which the two reaction functions intersect, thus there are optimal levels of resources used by both capital and labor to influence the enforcement effort. A similar argument holds for case (2) as well. Thus, the theorem is proved.

Theorem 3. Let (E_K*,E_L*) be capital and labor's optimal levels of political activity, and let (I_2,L_2) be the amounts of legal and illegal labor in productive activity that solve Problem I. Then

(3.1) $I_2 + L_2 = I_0 + L_0$; and
(3.2) $I_2 \geq I_0$ iff $\alpha_0 \geq \alpha\left(E_C^*, E_L^*\right)$.

Proof. From the second condition in (5) we get $\overline{w} = f'\left(I_2, L_2\right)$, and from the second condition in (1) we have $\overline{w} = f'\left(I_0, L_0\right)$. Given that $f'' < 0$, it must be the case that $I_0 + L_0 = I_2 + L_2$, which is (3.1). From the first-order conditions to Problem I (equations (5)), $\overline{w} - w^* = \dfrac{2k\alpha\left(E_K^*, E_L^*\right)I_2}{\overline{I}^2}$, and from equations (1) $\overline{w} - w^* = \dfrac{2k\alpha_0 I_0}{\overline{I}^2}$, thus $\alpha_0 I_0 = \alpha\left(E_K^*, E_L^*\right)I_2$, which implies (3.2).

Thus, theorem 3 says that political activities by capital and Home labor have no effect on the total number of workers hired by capital, but may affect the composition of legal and illegal workers. In particular, if capital is more politically successful than labor, thus reducing   below 0, the firm will hire more illegal workers and consequently less legal workers; and if Home labor is politically more successful than capital, the firm will hire less illegal workers and, thus, more legal workers.

C. Resource-using Enforcement Activity

In section A, we represented the government's preference for low unemployment of Home workers simply as an argument in the government's response-to-lobbying function, and we assumed that enforcement was costless to the government. In this section, we assume that there is a cost of enforcement for the government. Thus, unlike section A, the government now becomes an active player in the endogenous determination of enforcement, but labor is now passive.[5] As a result, the timing now involves a first-stage in which capital-owners and the government choose their strategic variables (lobbying resources and level of enforcement).

---

[5]This is closely related to the Feenstra-Bhagwati (1982) endogenous tariff model in which the government attempts to set a welfare optimal trade policy constrained by a single politically active interest. In Feenstra-Bhagwati that interest is taken to be labor, while in our model it is taken to be capital.

Suppose that the government determines enforcement effort by using resources. Let E_G be the quantity of resources used by the government to enhance the enforcement effort. The government's objective is to maximize total national product [$f(I + L)$], less payments to illegal workers (w^*I), and less resources used in enforcement (E_G). Home capitalists solve their problem in two steps: in the first step Home capitalists choose the levels of illegal and legal productive labor (I, L) conditional on given levels of political activity (E_G, E_K); the second step involves choosing the optimal level of political effort (E_K) given that the government is choosing its politically optimal level of enforcement effort. That is, we can write Home capital's problem as:

Problem III:

$$\max_{I,L} f\left(I,L\right)-\overline{w}L-w^*I-k\alpha\left(E_G,E_K\right)\frac{I^2}{\overline{I}^2}-E_K,$$

and

Problem IV:

$$\max_{E_K} \pi^*\left(E_K,E_G\right), \text{ s.t. } \left\{I,L\right\}\in\arg\max\left\{\text{Problem III}\right\}.$$

The first-order conditions for Problem III are:

$$\begin{aligned} f'\left(I+L\right)-w^*-\frac{2k\alpha I}{\overline{I}^2}&=0; \\ f'\left(I+L\right)-\overline{w}&=0. \end{aligned} \tag{1.9}$$

As in section B, we notice that

$$\begin{aligned} \frac{\partial I}{\partial E_K}&=-\frac{\partial L}{\partial E_K}=-\frac{I}{\alpha}\frac{\partial\alpha}{\partial E_K} \\ \frac{\partial I}{\partial E_G}&=-\frac{\partial L}{\partial E_G}=-\frac{I}{\alpha}\frac{\partial\alpha}{\partial E_G}. \end{aligned} \tag{1.10}$$

Thus, the first-order condition for Problem IV is:

$$1 + k\frac{I^2}{\overline{I}^2}\frac{\partial\alpha}{\partial E_K} = 0,$$

which implicitly defines Home capital's reaction function $E_K(E_G)$.

The government's problem can be written as

Problem G:

$$\max_{E_G} \; f\left(I+L\right) - w^* I - E_G, \text{ s.t. } \left\{I, L\right\} \in \arg\max\left\{\text{Probelm III}\right\}.$$

As a result, the government's reaction function is implicitly defined by the first-order condition to this problem:

$$w^*\frac{I}{\alpha}\frac{\partial\alpha}{\partial E_G} - 1 = 0. \tag{1.11}$$

Given the characterization of the strategic situation in (10) and (11), we have the following two results:

Theorem 4: There exists (E_K*, E_G*) such that (10) and (11) are satisfied.

Proof: The proof is the same as that for theorem 2, so we will not repeat it.

Theorem 5: Let (E_K*, E_G*) be the Nash equilibrium levels of political resources, and let (I_3, L_3) be capital's optimal levels of illegal and legal employment under Problem III. Then

(5.1) $I_3 + L_3 = I_0 + L_0$.

(5.2) $I_3 \geq I_0$ *iff* $\alpha_0 \geq \alpha(E_K{*}, E_G{*})$.

The proof follows that of theorem 3.

As with the case of inter-factor political competition, Theorem 5 says that political activity does not affect the level of total employment in the Home country, but can affect the composition of the workforce. Specifically, if the political activity of Home capital succeeds in reducing the level of enforcement below α_0, the employed workforce will be made up of more illegal workers and less illegal workers.

III. Concluding Comments

In this paper we have shown that it is a straight-forward task to endogenize the determination of immigration policy in a manner parallel to the analysis of endogenous trade policy. The results appear to be sensible and suggest some obvious directions for further research. In particular, we are interested in extending the framework to incorporate a more diversified production structure and endogenous determination of trade and immigration policy along the lines developed in Lovely and Nelson (1993).

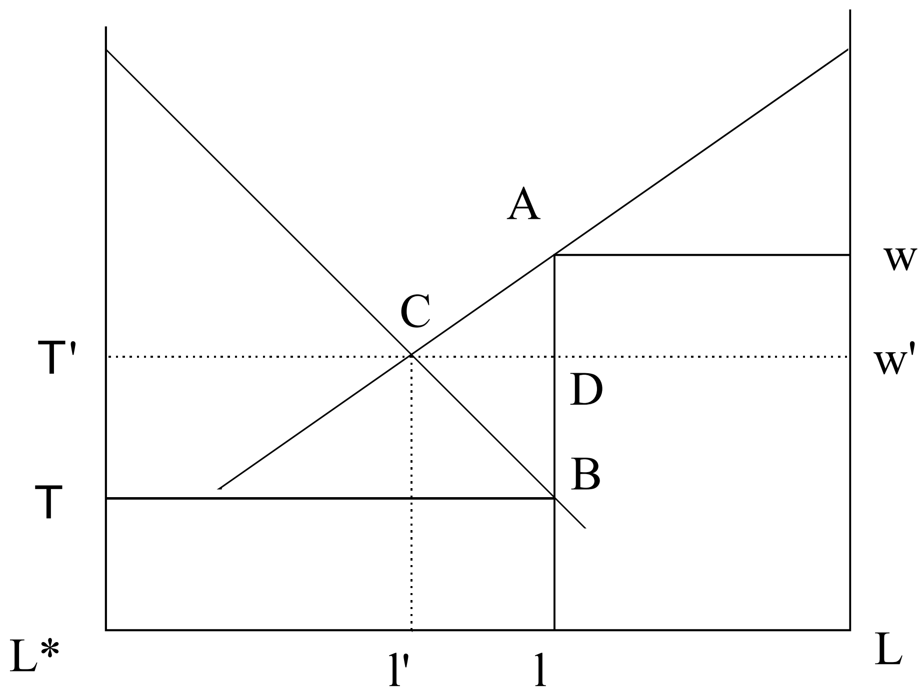

Figure 1

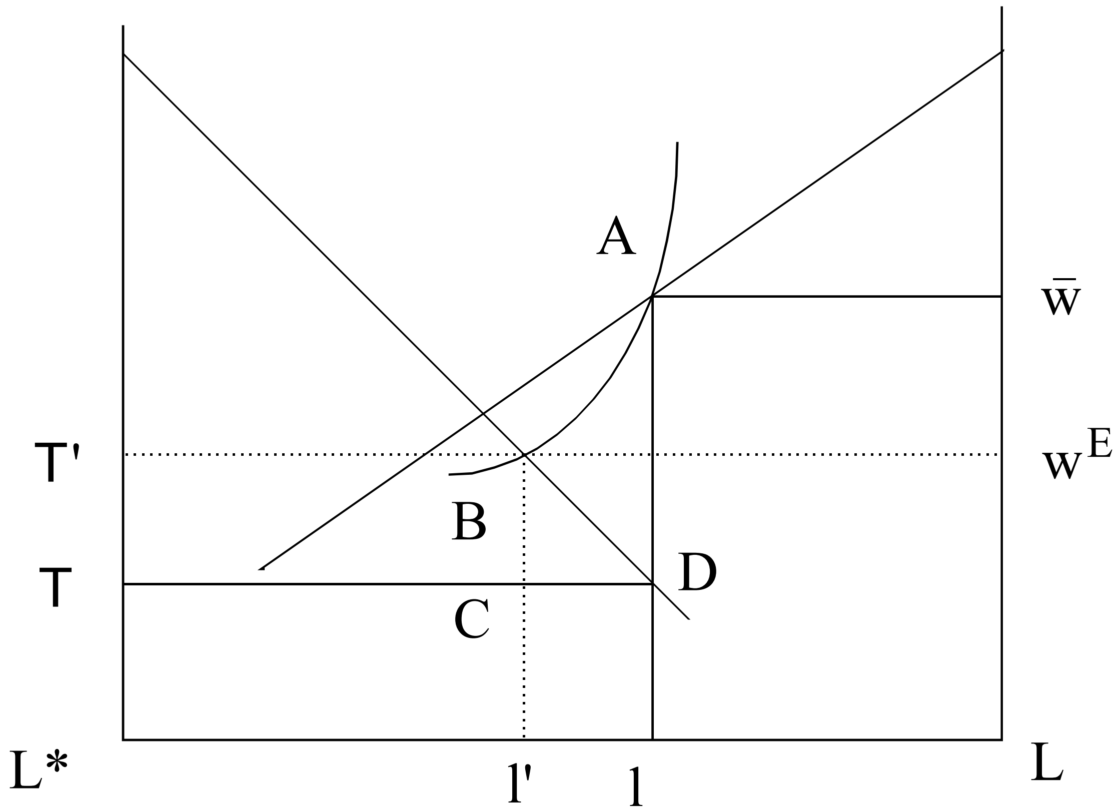

Figure 2

References

E. Bond and T.J. Chen (1987). “The Welfare Effects of Illegal Immigration”. *Journal of International Economics*. V.23-#?, pp. 315-328.

B. Chiswick (1988). “Illegal Immigration and Immigration Control”. *Journal of Economic Perspectives*; V.2-#3, pp. 101-115.

W.M. Corden and R. Findlay (1975). “Urban Unemployment, Intersectoral Capital Mobility and Development Policy”. *Economica*; V.43-#165, pp. 59-78.

S. Djaji (1987). “Illegal Aliens, Unemployment and Immigration Policy”. *Journal of Development Economics*. V.25-#?, pp. 235-249.

W. Ethier (1986). “Illegal Immigration: The Host-Country Problem”. *American Economic Review*; V.76-#1, pp. 56-71.

R. Feenstra and J. Bhagwati (1982). “Tariff Seeking and the Efficient Tariff”. in J. Bhagwati, ed. *Import Competition and Response*. Chicago: University of Chicago Press/NBER, pp. 245-258.

R. Findlay and S. Wellisz (1982). “Endogenous Tariffs, the Political Economy of Trade Restrictions, and Welfare”. in J. Bhagwati, ed. *Import Competition and Response*. Chicago: University of Chicago Press/NBER, pp. 223-234.

J. Harris and M. Todaro (1970). “Migration, Unemployment and Development: A Two-Sector Analysis”. *American Economic Review*; V.60-#1, pp. 126-142.

M. Lovely and D. Nelson (1993). “Shifting Sands: Policy Reform with Politically Active Smugglers”. ms: Syracuse University.

S. Peltzman (1976). “Toward a More General Theory of Regulation”. *Journal of Law and Economics*; V.19-#2, pp. 211-240.

C. Reynolds and R. McCleery (1988). “The Political-Economy of Immigration Law: Impact of Simpson-Rondino on the United States and Mexico”. *Journal of Economic Perspectives*; V.2-#3, pp. 117-131.

W. Shughart, R. Tollison, and M. Kimenyi (1986). “The Political Economy of Immigration Restrictions”. *Yale Journal of Regulation*; V.4-#?, pp. 79-97.