

Self-Interested Governments, Unionization, and Legal and Illegal Immigration

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Received 29 November 2007; Accepted 16 January 2008

Abstract This paper examines an economy with following properties. Attempts to restrain illegal immigration incur costs. Illegal workers can work only in the competitive sector. Workers and employers bargain over wages in the unionized sector and lobby the government for immigration policy and workers' bargaining power. The main findings are as follows. If the government can determine legal immigration, then it expropriates rents from labor unions. In that case, neither workers nor employers are worse off, if legal immigration is increased by an international agreement. High per worker public spending involves border enforcement and the protection of union power.

Keywords immigration, lobbying, labor unions, menu auction

JEL classification D72, D73, J51, J61

1. Introduction

In many Eastern European countries (e.g. Russia, Czech Republic and the Baltic Countries), immigration from poorer countries (e.g. Ukraine, Romania and the Central Asia) is a serious problem. An increase in population by (legal or illegal) immigration augments traffic, the demand for accommodation and the use of public goods and publicly subsidized services like schooling and medical care. In many countries, labor unions have protested against immigration laws, which they claim to be too liberal. At the same time, the authorities have restrained legal immigration and hampered illegal immigration though expensive border enforcement. In this paper, I attempt to explain and analyze this problem by game theory.

The earlier literature of economics has commonly examined public finance, labor market regulation and immigration policy as separate issues. In contrast, this paper considers the government as a single integrated agent which does all these things simultaneously, but which is subject to pressure from the interest groups. Consequently, I examine a political equilibrium in which employers and labor unions lobby a self-interested government for labor market regulation, immigration quotas and border enforcement. In the literature, there is some direct evidence that interest groups influence political decisions. Hanson and Spilimbergo (2001) examine by U.S. data whether border enforcement falls following positive shocks to sectors that are intensive in the use

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of undocumented labor. They find support for the assertion that authorities relax border enforcement when the demand for undocumented labor is high. Given this, it would be interesting to examine immigration policy in a model of political equilibrium.

Benhabib (1996) examines how immigration policy is determined, if the natives vote for policies that impose requirements on the immigrants. He shows that the resulting political equilibrium is very sensitive to the quality of immigrants and the composition of native population. Storesletten (2000) explores how a selective immigration policy could substitute for taxation in financing government spending. Razin et al. (2002) construct a model where population votes for the tax rate to finance redistribution in the economy. Dolmas and Huffman (2004) examine the integrated political economy of immigration and redistribution. All of these studies assume that the government has full and costless control over immigration. The relaxation of this assumption however changes the entire framework of public policy. On the other hand, some native people benefit from illegal immigrants through avoiding taxes and other obligations that would be compulsory for the legal workers.

Hillman and Weiss (1999) examine an economy with legal and illegal immigration by the specific-factors model. They show that if illegal immigrants consume relatively less non-traded goods than natives, then the median voter tolerates them but confines them to the sectors producing non-traded rather than traded goods. Myers and Papa-georgiou (2000) consider a rich country with a benevolent government, costly immigration control and a redistributive public sector. They show that if illegal immigrants have access to public services, then immigration is regulated, but if they are excluded from public services, then no border controls are enforced. These studies however assume that the political economy is organized through a direct vote by domestic residents over alternative policy measures (e.g. immigration quotas, the tax rate). In contrast, I assume that interest groups lobby a self-interested government that makes all policy decisions.

Lobbying can be examined either by the *all-pay auction model* in which the lobbyist with the higher effort wins with certainty, or the *menu-auction model* in which the lobbyists announce their bids contingent on the politician's actions. In the all-pay auction model, lobbying expenditures are incurred by all the lobbyists before the politician takes an action. In the menu-auction model, it is not possible for a lobbyist to spend money and effort on lobbying without getting what he lobbied for.

I have found only four papers that consider endogenous determination of migration quotas by lobbying. Amegashie (2004) uses the all-pay auction model for the case in which the union and the firm first lobby the government for the immigration quota and then bargain over the wage of natives. Bellettini and Berti Ceroni (2005) use the menu-auction model for the same purpose. Epstein and Nitzan (2005) present a model where migration quotas are an outcome of a two-stage political struggle between workers and capitalists. First, the parties select their proposed policies. Second, they attempt to improve the probability that their proposals will be approved by their lobbying efforts. These three papers however ignore illegal immigration and consider immigration policy only in isolation from other public policy. Palokangas (2003) presents a menu-auction model for the case where firms and labor unions lobby the government over

taxation and labor market regulation. I extend that model for an open economy in which the government can set immigration quotas and control borders at some cost.

The remainder of this paper is organized as follows. Sections 2 and 3 specify the institutional background and collective bargaining. The government's behaviour is endogenized in section 4 and 5. Finally, section 6 shows that a political equilibrium with union power and immigration quotas is possible.

2. The setting

I examine a small open economy with two sectors. In the *unionized sector*, a large number of firms produces output from labor l with decreasing returns to scale and all workers are unionized. The output price for the unionized sector is chosen as the numeraire. By duality, profits π and employment l in the unionized sector are then determined by the union wage w as follows:

$$\pi(w), \quad l(w) = -\pi'(w), \quad l' = -\pi'' < 0 \quad (1)$$

Because the unions expose all illegal immigrants, there can be only legal immigrants in the unionized sector. Following Blanchard and Giavazzi (2003) and Palokangas (2003), I assume that the government can regulate relative union bargaining power directly and smoothly e.g. by union laws, compulsory arbitration or the requirements for protection work.

In the *competitive sector*, one unit of output is produced from one labor unit and therefore the wage equals the output price p . Some firms in the competitive sector employ illegal immigrants and do not pay taxes. I assume that the workers consume the outputs of both sectors but the profit-earners only the output of the unionized sector (= the numeraire good), for simplicity.¹ I assume too that profits are not taxed, for simplicity.² Thus, the income tax t is imposed only on native workers' and legal immigrants' wages.

There is a fixed number n of native workers. The government determines the quota m for legal immigrants. Following Ethier (1986), I specify total labor supply s and illegal immigration $s - n - m$ as follows. Those who illegally attempt to immigrate will be caught and denied entry with probability q . This probability is an increasing function of the resources b government devotes to border control:

$$q(b), \quad b \geq 0, \quad q' > 0, \quad q'' < 0, \quad q(0) = 0, \quad \lim_{b \rightarrow \infty} q = 1 \quad (2)$$

Foreign workers have the choice of remaining abroad and earning the wage \bar{w} , which I take to be exogenous, or of attempting to migrate. If successful, they earn the competitive-sector wage p . If unsuccessful, they earn $\bar{w} - k$, where k is the constant

¹ Thus, the profits do not affect the demand for the competitive-sector good which simplifies aggregation.

² What is essential for the results is that it is more difficult to tax profits than labor income. With this property, the union wage in the political equilibrium can be higher than the competitive wage. Following Palokangas (2003), the results of this paper can be extended with some complication for the case where there are separate taxes for wages and profits, but the profit-earners can conceal their income at some cost.

penalty suffered by those who are caught. On the assumption that foreign workers are risk neutral, attempted migration adjusts so that the expected reward from migration, $(\varpi - k)q + p(1 - q)$, is equal to the foreign wage ϖ . From this and (2) it follows that the competitive-sector wage p is directly determined by the resources b devoted to border enforcement:

$$p(b) = \varpi + kq(b)/[1 - q(b)], \quad p(0) = \varpi, \quad p' > 0, \quad p'' < 0 \quad (3)$$

Each native or immigrant worker supplies one labor unit. His utility function is assumed to be linear in the unionized-sector good but quadratic in the competitive-sector good, for simplicity:³

$$u = I - ph + \eta h - (\delta/2)h^2, \quad (4)$$

where I is his after-tax income, h is his consumption of the competitive-sector good, $I - ph$ his consumption of the unionized-sector good (= his income I minus his expenditure ph on the competitive-sector good) and δ and η are positive constants. In equilibrium, the price p of the competitive-sector good is equal to the marginal utility for the competitive-sector good:

$$p = \partial u / \partial h = \eta - \delta h \quad (5)$$

Because, by the equilibrium condition (5), all s workers consume the same amount h of the competitive-sector good, the demand for that good is equal to sh . The competitive sector employs the rest $s - l$ of the workers and produces $s - l$ units of its output. The equilibrium condition for the market for the competitive-sector good is therefore given by $sh = s - l$. This yields

$$h = 1 - l/s. \quad (6)$$

Inserting this, (1) and (3) into (5), one obtains the labor supply as follows:

$$s(w, b) = \frac{\delta l(w)}{p(b) + \delta - \eta}, \quad s_w = \frac{\partial s}{\partial w} = \frac{s}{l} l' < 0, \quad s_b = \frac{\partial s}{\partial b} < 0 \quad (7)$$

An increase in the union wage w decreases employment in the unionized sector, l , the demand for the competitive-sector good, the competitive-sector wage p , illegal immigration and ultimately labor supply s . Looser border enforcement (i.e. a smaller b) increases labor supply s . The sum of native workers and legal immigrants cannot exceed labor supply (7):

$$n + m \leq s(w, b) \quad (8)$$

When resources devoted to border control, b , are high enough, then there is no illegal immigration and $n + m = s$ holds true.

³ With this assumption, the demand for the competitive-sector good then depends on the numbers of the workers, not on a single worker's income, which simplifies the construction of the labor supply function (7).

Given the structure of the economy (1)-(8), the agents act as players in the following extensive game: (i) The employers and native workers lobby the government for relative union bargaining power α , the quota for legal immigration, m , and the resources devoted to border enforcement, b . (ii) The government decides on (α, m, b) and collects the lobbying contributions. (iii) Firms and unions bargain over the union wage w .⁴

3. The labor market

The wage cannot be lower in the unionized than in the competitive sector. Noting (3), this constraint can be written in the form

$$w \geq p(b). \quad (9)$$

Union power is not effective, if wage equality $w = p$ holds true. I consider next the equilibrium with effective union power $w > p$.

The union members' benefit of being employed in the unionized sector is equal to the wage margin $w - p$ times employment in the unionized sector, l . Noting (1) and (3), this *union rent* is given by

$$V(w, b) = l(w)[w - p(b)], \quad \partial V / \partial b < 0. \quad (10)$$

In asymmetric Nash bargaining over the wage w , the labor union attempts to maximize its rent (10), while the employer attempts to maximize its profit (1), given the resources the government devotes to border control, b . The outcome of such bargaining is obtained through maximizing the Generalized Nash product $V^\alpha \pi^{1-\alpha}$ by w , where constant $\alpha \in (0, 1)$ is relative union bargaining power. One can then equivalently maximize an increasing transformation of the product $V^\alpha \pi^{1-\alpha}$ as follows:

$$\begin{aligned} \Delta(w, b, \alpha) &= (1/\alpha) \log[V^\alpha \pi^{1-\alpha}] = \log V + (1/\alpha - 1) \log \pi \\ &= \log l(w) + \log[w - p(b)] + (1/\alpha - 1) \log \pi(w) \end{aligned}$$

Noting (1), this yields the first-order and second-order conditions

$$\frac{\partial \Delta}{\partial w} = \underbrace{\frac{l'(w)}{l(w)}}_{-} + \underbrace{\frac{1}{w - p(b)}}_{+} + \underbrace{\left(1 - \frac{1}{\alpha}\right)}_{-} \underbrace{\frac{l(w)}{\pi(w)}}_{+} = 0 \quad \text{and} \quad \frac{\partial^2 \Delta}{\partial w^2} < 0 \quad \text{for } w > p. \quad (11)$$

This equation implies that an increase in the union wage w raises union rent:

$$\partial V / \partial w = (1/\alpha - 1)l/\pi > 0 \quad (12)$$

⁴ Palokangas (2003) shows by a model rather similar to the one in this paper that right-to-manage bargaining is the only stable type of bargaining, for the union and the firm have every incentive to agree *ex ante* that no bargaining over employment is used. On the basis of this result, I ignore here the bargaining over employment, for simplicity.

The equation (11) alone ensures that union power is effective, $w > p$, for all $\alpha > 0$. Wage equality $w = p$ holds only when the government eliminates union power entirely (i.e. when $\alpha = 0$).

Differentiating the equation (11) totally, one obtains

$$w = W(\alpha, b), \quad \frac{\partial W}{\partial \alpha} = - \frac{\partial^2 \Delta}{\partial w \partial \alpha} / \frac{\partial^2 \Delta}{\partial w^2} = - \frac{l}{\alpha^2 \pi} / \frac{\partial^2 \Delta}{\partial w^2} > 0, \quad \lim_{\alpha \rightarrow 0} w = p.$$

If the government increases union power α through labor market regulation, then the union wage w increases. Because of this monotonic correspondence between w and α , union power α can in the model be replaced by the union wage w as the government's policy instrument.

4. The government

The tax base for the wage tax t is given by

$$wl + (n + m - l)p, \quad (13)$$

where wl is the wages in the unionized sector, p the wage in the competitive sector, $n + m - l$ the number of tax-paying workers (= native workers + legal immigrants) in the competitive sector and $(n + m - l)p$ the wages of these workers. I assume there is constant government expenditure g per each (native or immigrant) worker, so that total government spending is equal to gs plus the cost of border control, b .⁵ Noting the tax base (13), I can then specify the government's budget constraint as follows:

$$gs + b = t [wl + (n + m - l)p] \quad (14)$$

I assume that there is no discrimination between the n native workers and the m legal immigrants in the labor market. Consider a single worker that belongs to either of these groups. The probability that he will be employed in the unionized sector is equal to $l/(n + m)$, and the probability that he will be employed in the competitive sector is equal to $1 - l/(n + m)$, where l is employment in the unionized sector and $n + m$ the number of native workers and legal immigrants taken together. A legal worker's expected income is $wl/(n + m) + p[1 - l/(n + m)]$, where w and p are the wages in the unionized and the competitive sector, respectively. Noting (14), his expected after-tax income is equal to

$$I_l = (1 - t) \left[\frac{wl}{n + m} + \left(1 - \frac{l}{n + m}\right)p \right] = \frac{wl}{n + m} + \left(1 - \frac{l}{n + m}\right)p - \frac{gs + b}{n + m}. \quad (15)$$

⁵ Here, the crucial point is that the government cannot discriminate illegal immigrants for public expenditures. It is possible to make government spending g endogenous by introducing public services in the worker's utility function (4). This would involve additional complications in the model without having any changes in the results.

In equilibrium, a legal worker's expected after tax income I_l must exceed an illegal worker's income p since otherwise, there is no incentives to remain as a legal worker. Noting (15), this incentive constraint $I_l > p$ is equivalent to

$$I_l - p = \frac{(w - p)l - gs - b}{n + m} > 0. \quad (16)$$

Inserting $I = I_l$ and (15) into a worker's utility function (4), and noting (1), (3), (6), (7) and (16), I obtain the representative native worker's (and the legal immigrant's) welfare v as follows:

$$\begin{aligned} v(w, m, b) &= \frac{wl(w)}{n + m} + \left[1 - \frac{l(w)}{n + m} \right] p(b) - \frac{b + gs(w, b)}{n + m} + \max_h \left[\eta h - p(b)h - \frac{\delta}{2} h^2 \right], \\ \frac{\partial v}{\partial b} &= \left(1 - \frac{l}{n + m} - h \right) p' - \frac{1 + gs_b}{n + m} = \left(\frac{l}{s} - \frac{l}{n + m} \right) p' - \frac{1 + gs_b}{n + m} \\ &= \frac{1}{n + m} \left[\left(\frac{n + m}{s} - 1 \right) l p' - 1 - gs_b \right], \\ \frac{\partial v}{\partial m} &= \frac{(p - w)l + b + gs}{(n + m)^2} = \frac{p - I_l}{n + m} < 0, \quad \frac{\partial v}{\partial w} = \frac{(w - p)l' + l - gs_w}{n + m}, \\ \frac{\partial(nv + \pi)}{\partial w} &= \frac{n}{n + m} \left[(w - p)l' - \frac{m}{n} l - gs_w \right] \end{aligned} \quad (17)$$

I assume that some international agreement determines a lower limit $\theta \geq 0$ for legal immigration m . If there is no such agreement, then $\theta = 0$ holds true in the model. Both the representative native worker and the representative employer lobby the government for the quota for legal immigration, m , the resources devoted to border enforcement, b , and the union wage w through relative union bargaining power α . Noting (8) and (9), the government chooses its policy parameters (m, b, w) from the set

$$\Gamma = \{ (w, m, b) \mid m \geq \theta, \quad b \geq 0, \quad w \geq p(b), \quad s(w, b) \geq n + m \}. \quad (18)$$

I denote the representative native worker's and the representative employer's political contributions by R^w and R^c , respectively. Subtracting R^w from the native worker's welfare (17) yields his rent C_w . Subtracting R^c from the profit π in (1) yields the employers' rent C_f . Inserting the functions (1) and (17) into these definitions, I obtain

$$\begin{aligned} C_w(w, m, b, R^w) &= v(w, m, b) - R^w \quad \text{with} \quad \partial C_w / \partial R^w = -1, \\ C_f(w, R^c) &= \pi(w) - R^c \quad \text{with} \quad \partial C_f / \partial R^c = -1. \end{aligned} \quad (19)$$

Following Grossman and Helpman (1994), and given (19), I can define the government's utility function as follows:

$$G(w, m, b, R^w, R^c) = nR^w + R^c + \beta nU^c(C_f) + \gamma U^w(C_w), \quad (20)$$

where n is the number of native workers, U^c and U^w are increasing and differentiable functions, and parameters $\beta \geq 0$ and $\gamma \geq 0$ the weights given to the welfare of the

employers and native workers, respectively. Grossman and Helpman's (1994) utility function (20) is widely used in models of common agency and it has been justified as follows. The politicians are mainly interested in their own income (= contributions from the public) $R^w + R^f$, but because they must defend their position in general elections, they may also take the utilities of the interest groups $U_w(C_w)$ and $U_f(C_f)$ into account directly. The linearity of (20) in $R^w + R^f$ is assumed, for simplicity.

5. The political equilibrium

In this section, I explore the political equilibrium with lobbying as follows. The contribution schedule of the native workers is given by $R^w(w, m, b)$, and that of the employers by $R^c(w, m, b)$. The government maximizes its welfare (20) by choosing $(w, m, b) \in \Gamma$. Following proposition 1 of Dixit et al. (1997), a subgame perfect Nash equilibrium for this game is a set of contribution schedules $R^w(w, m, b)$ and $R^c(w, m, b)$ and public policy (w^*, m^*, b^*) such that the following conditions are satisfied:

- (i) Contributions are non-negative but less than the income of the contributing lobby.
- (ii) The policy (w^*, m^*, b^*) maximizes the government's welfare (20) taking the contribution schedules as given,

$$(w^*, m^*, b^*) \in \arg \max_{(w, m, b) \in \Gamma} G(w, m, b, R^w(w, m, b), R^c(w, m, b)). \quad (21)$$

- (iii) The native workers (employers) cannot have a feasible strategy $R^w(w, m, b)$ ($R^c(w, m, b)$) that yields them a higher level of utility than in equilibrium, given the government's anticipated decision rule,

$$\begin{aligned} (w^*, m^*, b^*, R^w(w^*, m^*, b^*)) &\in \arg \max_{(w, m, b) \in \Gamma} C_w(w, m, b, R^w(w, m, b)), \\ (w^*, R^c(w^*, m^*, b^*)) &\in \arg \max_{(w) \in \Gamma} C_f(w, R^c(w, m, b)). \end{aligned} \quad (22)$$

- (iv) The native workers (employers) provide the government at least with the level of utility that it could get when the native workers (employers) offer nothing $R^w = 0$ ($R^c = 0$) and the government responds optimally given the employers' (native workers') contribution function,

$$\begin{aligned} G(w, m, b, R^w(w, m, b), R^c(w, m, b)) &\geq \sup_{(\tilde{w}, \tilde{m}, \tilde{b}) \in \Gamma} G(\tilde{w}, \tilde{m}, \tilde{b}, R^w(\tilde{w}, \tilde{m}, \tilde{b}), 0), \\ G(w, m, b, R^w(w, m, b), R^c(w, m, b)) &\geq \sup_{(\tilde{w}, \tilde{m}, \tilde{b}) \in \Gamma} G(\tilde{w}, \tilde{m}, \tilde{b}, 0, R^c(\tilde{w}, \tilde{m}, \tilde{b})). \end{aligned} \quad (23)$$

Given differentiable functions (19), conditions (22) take the form

$$\partial v / \partial i = \partial R^w / \partial i \quad \text{and} \quad \partial \pi / \partial i = \partial R^c / \partial i \quad \text{for } i = w, m, b. \quad (24)$$

which suggests that in equilibrium the change in the native worker's (employer's) contribution R^w (R^c) due to a change in the instrument i is equal to the change in his welfare v (π) due to this same fact. Thus, the contribution schedules are locally truthful. As in Bernheim and Whinston (1986), or in Grossman and Helpman (1994), this concept can be extended to a globally truthful contribution schedule that represents the native worker's (employer's) preferences at all policy points. Because the contributions cannot be negative, given (19), (23) and (24), the native worker's and employer's truthful contribution functions are given by

$$R^w = \max[0, v(w, m, b) - v_0], \quad R^c = \max[0, \pi(w) - \pi_0], \quad (25)$$

where v_0 and π_0 are integration constants. Because $R^w = 0$ for $v \leq v_0$, then v_0 is the utility the native worker obtains when he does not pay contributions but the government chooses its best response given the firm's contribution schedule. Given (17), the native worker's welfare v is a decreasing function of the quota m . If he does not pay enough contributions R^w , then the government can press his utility v to the lowest possible level by legalizing all immigrants, $m = s - n$. Thus, one can define $v_0 = \min_{\theta \leq m \leq s-n} v = v|_{m=s-n}$. Noting (19) and (25), this definition leads to $R^w = v - v_0 = v - v|_{m=s-n}$, $C_w = v - R^w = v|_{m=s-n}$ and the following result:

Proposition 1. *The government uses the quota m for legal immigration as a non-distorting income transfer to the workers. It presses the native worker's rent to the minimum $C_w = v|_{m=s-n}$ by threatening to legalize all immigrants.*

Given (19), the employers are indifferent to the quota m , $\partial C_f / \partial m \equiv 0$. This and Proposition 1 lead to the following corollary:

Proposition 2. *The native workers and the employers lose nothing, if the lower limit θ for the immigration quota m were increased from outside by an international agreement.*

6. The public policy

Noting (25), the conditions (21) take the form that the government's utility function (20) must be maximized by (w, m, b) subject to the set (18):

$$\begin{aligned} (w, m, b) &= \arg \max_{(w, m, b) \in \Gamma} [nR^w + R^c + \beta nU^c(C_f^*) + \gamma U^w(C_w^*)] \\ &= \arg \max_{(w, m, b) \in \Gamma} [nR^w(w, m, b) + R^c(w, m, b)] \\ &= \arg \max_{(w, m, b) \in \Gamma} [nv(w, m, b) + \pi(w)], \end{aligned} \quad (26)$$

where C_f^* and C_w^* are the equilibrium values of the employer's and native worker's rents C_f and C_w . Noting (22) and duality, C_f^* and C_w^* can be taken as given in (26). Given (17) and (18), the condition (26) for m is equivalent to

$$m = \max_{\theta \leq m \leq s(w, b) - n} [nv(w, m, b) + \pi(w)] = \theta. \quad (27)$$

This can be rephrased as follows:

Proposition 3. *The government minimizes legal immigration, $m = \theta$.*

Given (17) and (18), it is true that

$$\lim_{g \rightarrow 0} \frac{\partial(nv + \pi)}{\partial b} = n \lim_{g \rightarrow 0} \frac{\partial v}{\partial b} = \frac{n}{n+m} \left\{ \underbrace{\left[\frac{n+m}{s(w,b)} - 1 \right]}_{-} \underbrace{l(w)p'(b)}_{+} - 1 \right\} < 0,$$

$$\lim_{g \rightarrow 0} \frac{\partial(nv + \pi)}{\partial w} = \frac{n}{n+m} \left\{ \underbrace{[w - p(b)]}_{+} \underbrace{l'(w)}_{-} - \underbrace{\frac{m}{n} l(w)}_{+} \right\} < 0.$$

These inequalities and the conditions (26) for b and w lead to the following result:

Proposition 4. *If per worker public expenditures, g , are small enough, then the government abolishes border enforcement, $b = 0$, and presses the union wage w down to the competitive-sector wage p by labor market deregulation.*

The unionized-sector employer is indifferent to border enforcement b . An increase in border enforcement b increases the competitive-sector wage p and the native worker's costs. Thus, there is nobody that would lobby for border enforcement. Because an increase in the union wage w decreases national income $nv + \pi$, the labor market is deregulated in the political equilibrium.

If g is large enough, then, given (17) and (18), the conditions (26) for b and w are equivalent to⁶

$$\frac{\partial(nv + \pi)}{\partial b} = n \frac{\partial v}{\partial b} = \frac{n}{n+m} \left\{ \underbrace{\left[\frac{n+m}{s(w,b)} - 1 \right]}_{-} \underbrace{l(w)p'(b)}_{+} - \underbrace{gs_b(w,b)}_{-} \right\} = 0,$$

$$\frac{\partial(nv + \pi)}{\partial w} = \frac{n}{n+m} \left\{ \underbrace{[w - p(b)]}_{+} \underbrace{l'(w)}_{-} - \underbrace{\frac{m}{n} l(w)}_{+} - \underbrace{gs_w(w,b)}_{-} \right\} = 0.$$

Thus, there is an interior solution for the wage w and border enforcement b :

$$\underbrace{\left[1 - \frac{n+m}{s(w,b)} \right]}_{+} \underbrace{l(w)p'(b)}_{+} = \underbrace{gs_b(w,b)}_{-} - 1 \tag{28}$$

$$\underbrace{[p(b) - w]}_{-} \underbrace{l'(w)}_{-} + \underbrace{\frac{m}{n} l(w)}_{+} = \underbrace{gs_w(w,b)}_{-} \tag{29}$$

These results can be rephrased as follows:

⁶ Here, I assume that the increase in border enforcement decreases the government's total expenditures $gs + b$, $\partial(gs + b)/\partial b = gs_b + 1 < 0$. Otherwise, $\partial(nv + \pi)/\partial b < 0$ holds true and the government has no incentives to maintain border enforcement, $b = 0$.

Proposition 5. *If per worker public expenditures, g , are large enough, then the government protects union power (i.e. $w > p$) and chooses the union wage w , and the expenditure on border control, b , to maximize total domestic income $nv(w, m, b) + \pi(b)$.*

Public spending in fixed proportion g to the labor supply s creates another channel through which political measures affect welfare. The equation (28) can be interpreted as follows. The left-hand side $[1 - (n + m)/s]lp' > 0$ tells how much border enforcement b increases a legal worker's costs through a higher competitive-sector wage p . The right-hand side $-gs_b - 1 > 0$ tells how much border enforcement decreases public spending and a legal worker's taxes through labor supply s and direct enforcement cost b . In the political equilibrium, these two effects must be balanced. The equation (29) can be interpreted as follows. The left-hand side $(p - w)l' + (m/n)l > 0$ tells how much national income $nv + \pi$ decreases with a higher union wage w . The right-hand side $-gs_w > 0$ tells how much an increase in the union wage w decreases public spending and taxes through labor supply s . In the political equilibrium, these two effects must be balanced.

7. Conclusions

In this paper, I examine the political equilibrium with immigration and collective bargaining in an open economy with a self-interested government. The structure of the economy can be characterized by the following three-stage game. (i) The lobbies representing native workers and employers offer contributions to the government to influence public policy. (ii) The government decides on union power, immigration quotas and resources devoted to border enforcement, and collects the corresponding political contributions. (iii) Unions and firms bargain over wages.

Many empirical studies document that the impact of migration on relative wages is small or even non-existent.⁷ This suggests that there should be no causality between wages and immigration. Commonly, this outcome has been explained by the assertion that immigration changes wages of different professions to different directions, so that the net effect on the average wage is insignificant. In this paper, I offer an alternative explanation as follows. Immigration quotas, border enforcement and union wages should have no causality at all, because they are simultaneously determined by the political equilibrium between the government and the lobbying interest groups.

A self-interested government uses the quota for legal immigration as a non-distorting income transfer from the workers. Threatening to legalize all immigration, it is able to press the native worker's rent to the minimum through claiming more and more contributions. Because wages that are determined by collective bargaining are independent of the immigration quota, the employers are indifferent to the quota. Consequently, the

⁷ Cf. Hunt (1992), DeNew and Zimmermann (1994), Bauer (1997), Brücker, Kreyenfeld and Schröpfer (1999), Winter-Ebmer and Zimmermann (1999), Trabold and Trübswetter (2001), Hofer and Huber (2003), and Zorlu and Hartog (2005). Brücker, Frick and Wagner (2004) summarize these studies in their Table 9 as follows: "The empirical findings ... indicate, with the exception of few outliers, that a one percent increase in the labor force through migration yields a change in native wages in a range between minus and plus one per cent; majority of the studies indicate that the change in native wages is in a range between minus and plus 0.3 per cent."

native workers and the employers are not worse off, if immigration quotas are increased from outside by an international agreement.

The unionized-sector employers are indifferent to border enforcement, because union wages are independent of this. The competitive-sector employers are indifferent to border enforcement as well, because they earn no profits. An increase in border enforcement raises the competitive-sector wage and the native worker's costs on the one hand, but lowers the labor supply, government spending and taxes falling on a native worker on the other hand. If per worker public spending is so small that the former effect through the competitive-sector wage dominates, then neither the native workers nor the employers have incentives to lobby for border enforcement and there will be free entry of immigrants. Otherwise, when per worker public spending is high enough, the government raises border enforcement to the level where the two opposing effects are balanced.

An increase in the union wage decreases national income on the one hand, but decreases employment in the unionized sector, the labor supply, government spending and taxes falling on the private sector on the other hand. If per worker public spending is so small that the former effect through national income dominates, then the government deregulates labor market. Otherwise, when per worker public spending is high enough, the government raises relative union bargaining power and the union wage to the level where the two opposing effects are balanced.

Acknowledgment The author thanks referees for constructive comments.

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