Preliminary Version

The Struggle over Migration Policy**

Gil S. Epstein[a, b,*] , Shmuel Nitzan[a]

Abstract

In this paper we analyze the endogenous determination of migration quota viewing it as an outcome of a two-stage political struggle between two interest groups: those in favor and those against the proposed migration quota. We first compare the proposed policies of the two interest groups under random behavior of the government, with and without lobbying. The paper proceeds with the examination of the effect of government intervention in the proposal of the quota on its nature, assuming that, with and without government intervention, the uncertain approval of the proposal is the outcome of a lobbying contest between the two interest groups.

Keywords: migration quota, workers union, capital owners, interest groups, lobbying, government intervention.

[a] Department of Economics, Bar-Ilan University, 52900 Ramat-Gan, Israel

[b] CEPR, London and IZA, Bonn.

*Corresponding author: Department of Economics, Bar-Ilan University, 52900 Ramat-Gan, Israel. Fax: 972 3 535-3180, E-mail: epsteig@mail.biu.ac.il.

** We are grateful to Ira Gang for helpful and constructive comments.

1. Introduction

The effect migration on the host countries is usually unclear. There exists a large literature on the effect migrants have on the local population, see for example, Benhabib (1996), Borjas (1994), (1995), Gang and Rivera-Batiz (1994), Schmidt, Stilz, and Zimmermann (1994), Zimmermann (1995) and more recently, Boeri, Hanson and McCormick (2002). One thing is apparent, except in unusual circumstances, Western countries tend to spend significant resources towards limiting the number and/or types of immigrants they allow into their countries. These limits are upheld via both border controls, through which undesired people are blocked from entering, and via internal enforcement, whereby undesired people are apprehended and expelled from the country (see, for example, Ethier (1986)).

Whatever way you look at it, whether migration has a positive, negative or no effect on the host country, the number of migrants in different western counties is very high. For example, in 1998 Denmark had 256,000 migrants that constituted 2.5% of the population, Finland 552,000 (1.6%), the UK 2,208,000 (3.8%), Belgium 892,000 (8.7%), France 3,231,000 (6.3%), Switzerland 1,347,000 (19%), Germany 7,319,000 (8.9%)[1] and over 11.7 million foreign-born workers in the US (9%)[2]. Moreover, there are many concentrations of migrants of the same origin in different host countries. For instance, there are concentrations of Turks in Germany, Tamils in Switzerland, Moroccans in the Netherlands and Belgium, Italians in Argentina, Greeks in Australia and Ukrainians in Canada. There are also more specific instances where emigrants from a certain town or region concentrate in the same foreign town or region. One of many such examples is the Macedonians from Skopje who have come to make up a sizable part of the population of Göteburg in Sweden. Such concentrations of migrants often cause xenophobia.

Empirical evidence from the EU countries shows that immigration had at most a very small impact on wages and employment opportunities of natives. Nevertheless, in the 1997 Eurobarometer survey, immigration turns out to be one of the three most significant political or social issues. It is not surprising therefore that with a large number of migrants, the high unemployment rate in some of the host countries, xenophobia, and the perceived effect the migrants have on the local population

[1] In the middle of this century Germany was in need of workers, and actively sought temporary workers especially from Turkey. Many of these "temporary" workers remained in the country after the expiry of their contract.

[2] Source: Boeri, Hanson and McCormick (2002).

(workers and capital owners), migration policy is becoming an important issue in the different developed countries and, in particular, it has become a central issue in the elections held in these countries.

Migration policy involves a large range of issues such as legal and illegal migrants, temporary and permanent migration, high skilled and low skilled migration and asylum seekers and family unification. Many studies have been carried out regarding the optimal migration policy and the effects that different migration policies might have on the host country. Concern has been focused on whether to impose capital and skill requirements on the migrants, Benhabib (1996), on the alternative future policy options, given past experience, Zimmermann (1995)[3], on whether a reform of immigration policy can alone resolve the fiscal problems associated with the aging of the baby boom generation, Storesletten (2000), on the preferred policy regarding temporary and illegal migration, Epstein (2002), Epstein, Hillman and Weiss (1999) and Hillman and Weiss (1999) and on the migration policy implications of efficiency wage setting, Epstein and Hillman (2002). Other implications of migration policy are studied in Boeri, Hanson and McCormick (2002) and Bauer and Zimmermann (2002) , see also references therein.

Even though there is a large literature concerned about migration policy, there is only one study on how in practice migration policy is determined[4]. Amegashie (2002) has recently studied a model in which the number of immigrants allowed into a country is the outcome of a costly political lobbying process between a firm and a union using the all-pay auction contest.

As in Amegashie (2002), and following Epstein and Nitzan (2002a, 2002b, 2002c)[5], we present a political framework where the approval of a migration policy is a function of the lobbying efforts of the groups competing for the approval and rejection of the proposed policy. In contrast to Amegashie (2002), we develop three alternative frameworks that allow a general contest success function which is positively affected by the different lobbying efforts of the contestants. It is assumed

[3] Zimmermann (1995) shows that there has been a limited positive effect on the labor market and thus there are only few alternative policy options in the future,

[4] For different aspects of political economy of migration see Sollner (1999), Buckley (1996) and Cukierman, Hercowitz and Pines (1993).

[5] Lobbying is an important part of the policy making process in representative democracies, Grossman and Helpman (2001), Persson and Tabellini (2000). Several studies have addressed the issue to what extent lobbying affects policy? Modelling lobbying as a "menu-auction", Grossman and Helpman (1996) study a Downsian model of electoral competition where candidates choose policies to maximize their probability of winning the elections.

that there are two interest groups: one against the proposed quota and the other in favor of it. Those against the migrants include: workers that fear that they will be adversely affected by migration, anti-immigrant groups, immigrants of previous generations that prefer not to be joined by other migrants to the host country, etc. To simplify the discussion, we assume that this group is represented by the workers' union. On the other side stand the capital owners that prefer a higher migration quota than the workers. We begin our analysis by considering the optimal migration quotas of the workers' union and the capital owners, assuming that each group behaves non-strategically, sincerely revealing its preferred policy. The support of these first best policies is plausible, if each group believes that its preferred policy has no effect on the implemented policy. We then examine the preferred policy proposals when the interest groups recognize that the approval or rejection of their preferred policy depends on their lobbying efforts. The first objective of the paper is to examine the effect of lobbying on the migration quota when the government is not involved in the proposal of the migration policy. We then introduce into the model a third player, a politician/bureaucrat who seeks to maximize a composite utility function that depends on two components: the expected social welfare and the lobbying efforts of the contestants. The welfare component and the lobbying component both have a positive effect on the politician's utility. Our second objective is to determine the optimal migration quota in this extended setting and to clarify how does government intervention in the proposal of the quota affect its nature and how does a change in the weight assigned by the government to the public well being affect the endogenous determination of the migration quota.

2. The Preferred Non-Strategic Migration Quotas

Migration affects both workers' earnings and utility and the profits of capital owners. Let us describe how migration quotas affect the two groups within a simple economic environment. As the number of migrants entering the host country increases, the labor market conditions change. Foreign labor (migrants) can be either complementary inputs or substitute inputs to local labor. In the former case, an increase in the number of migrants increases the equilibrium wages of the local workers and thus their utility. That is, when foreign and local labor are complements, an increase in the migration

quota increases the local workers' utility. [6] On the other hand, if foreign and local labor are substitutes, an increase in the migration quota decreases wages and, in turn, the utility of the local workers.[7] In such a case the utility of the local workers is inversely related to the migration quota. We assume that, in general, the two types of labor can be complements only under low migration levels. If this occurs, then at a sufficiently high migration level, local and foreign labor become substitutes.

Denote the migration quota by Q and a representative worker's utility by U_w. The northwest quadrant (quadrant II) of figure 1 presents the relationship between the migration quota and the utility of the local worker. For low migration quotas, there is a positives relationship between the quota and the local worker' utility. However, beyond the quota Q_w^*, an increase in the quota decreases the utility of the local worker, as the two types of labor become substitutes. Note that the utility of the local worker can be negative, although in the figure it is assumed to be positive and that it may well be the case that the local and foreign labor are always substitutes, in which case the curve in the figure is everywhere downward sloping.

Migration of foreign labor increases the capital owner's profits. When the two types of workers are substitutes, the increase in the labor supply decreases wages, and therefore production and the capital owners' profits are increased. It is assumed that even when the two types of workers are complements, even though migration may increase wages, profits increase. Hence, capital owners always prefer an increase in the migration quota. Such an increase does not mean that the producers have to employ all the workers. It may well be that, due to the existence of government intervention, the marginal value of production is smaller than the cost of employing more workers. For example, in the case of minimum wage, the producer may only employ workers that contribute nonnegative marginal profit to the firm (the value of their marginal product exceeds the minimum wage). In such a situation an increase in the migration quota does not increase nor decrease the profits of the firm.[8] Denoting by u_k the utility of the capital owners, the southeast quadrant of figure 1 presents the assumed positive relationship between the migration quota and the utility of the capital owners up to the quota Q_k^*.

[6] In an efficiency model where the migrants are the unemployed, for certain levels of migration, an increase in the quota increases the utility of the local population, Epstein and Hillman (2002).

[7] This utility may not be the actual one, but the perceived utility - the utility the local population believes it will receive under a given migration quota.

[8] We ignore the possibility that the burden of unemployed workers on the economy adversely affects the employers reducing their profits.

The northeast quadrant describes the relationship between the utility of the capital workers and the utility of the local workers. Both utilities increase with the migration quota in the interval $\left[0, Q_W^*\right]$. Beyond Q_w^*, but below Q_k^*, an increase in the migration quota decreases the utility of the local workers while increasing the utility of the capital owners. Increasing the migration quota beyond Q_k^* continues to reduce the utility of the workers, however, such an increase has no effect on the utility of the capital owners. As already noted, the utility of the local workers can always decrease with the quota and the utility of the capital owner may decrease with the quota. [9]

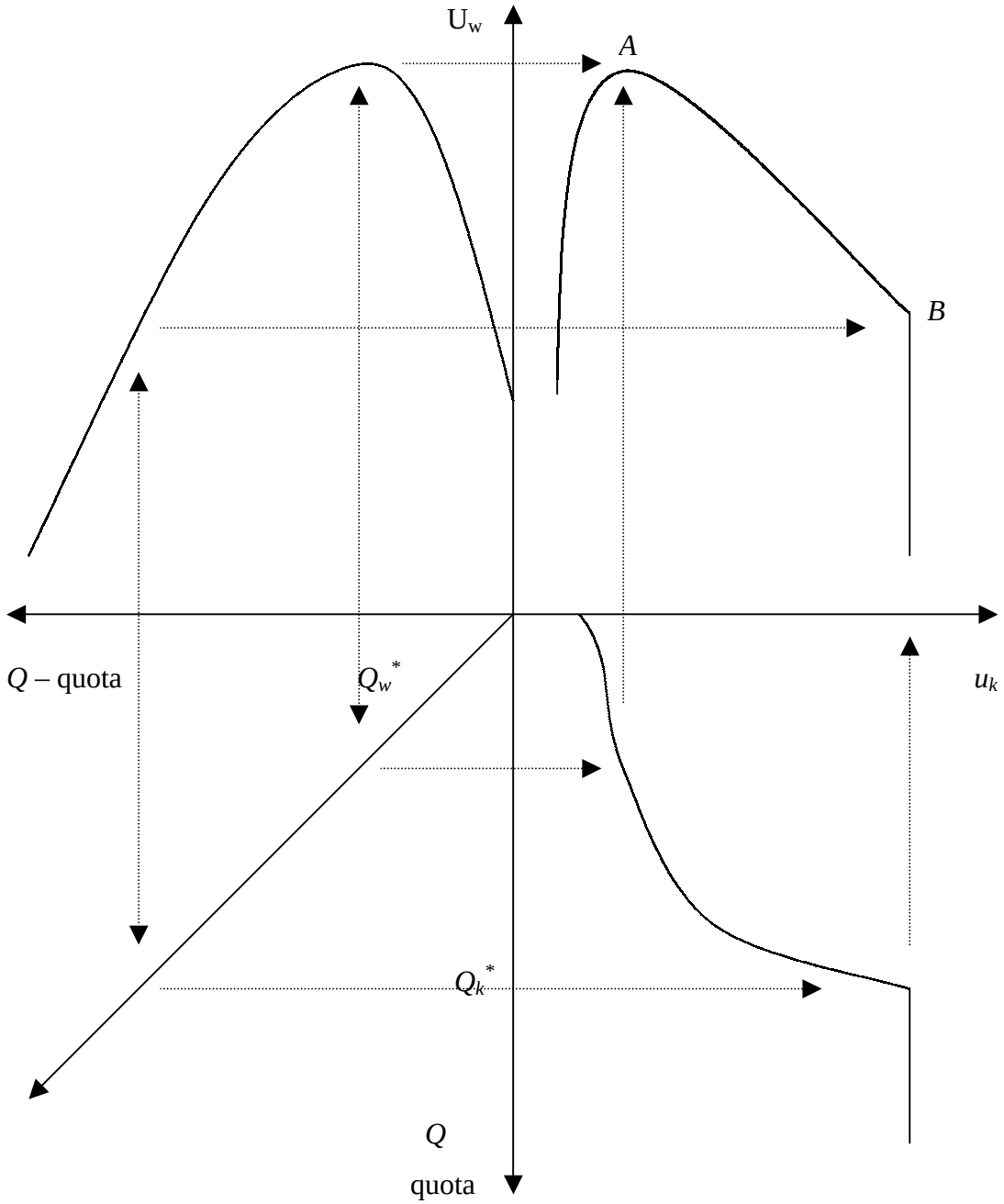
In our models, competition between the two interest groups is over the migration quota. It is clear that both groups prefer the quota Q_w^* to any smaller quota. A conflict of interests only arises when the governemnt contemplates a migration quota that exceeds Q_w^*. We therefore confine our analysis to the determination of migration quotas that are higher than Q_w^*.

3. The Effect of Lobbying: No Government Intervention in the Proposal Process

Suppose that a status-quo policy regarding the migration quota is challenged by the capital owners and defended by the worker's union. The workers' union, the defender of the status-quo policy, (henceforth interest group *w*) prefers the status-quo policy Q_w^* to any alternative policy. The capital owners, (interest group *k*) prefers the alternative policy Q_k^*. As argued above, $0 < Q_w^* < Q_k^*$. It is assumed that the policy Q_w^* (Q_k^*) is the optimal policy proposal of the workers (the capital owners), provided that their supported policy gains *certain approval*. That is, each interest group disregards the possibility that its preferred policy can be rejected, in which case the policy supported by the rival interest group is assumed to be approved. More generally, these quotas are preferred by the interest groups whenever they believe that the approved and implemented policy is independent of their behavior and, in particular, of their revealed preferred policies and the influence activities that are intended to promote the implementation of these preferred policies. In figure 1 these

[9]These type of results can also be derived from a Heckscher-Ohlin international trade model allowing international factor mobility (see Mundell, 1957).

Figure 1



most preferred policies and the corresponding utilities are represented, respectively, by point A, for the workers' union and point B, for the capital owners.[10]

Under effective lobbying, the actual implemented policy depends on the contest between the workers' union (henceforth, the workers) and the capital owners on the approval of their proposed policies. The equilibrium proposed policies, that are endogenously determined in our first alternative strategic settings, are denoted Q_k^{**} and Q_w^{**}. The outcome of the political contest is given in terms of the probabilities Pr_k and Pr_w that the workers and the capital owners win the contest. The outcome of the contest depends on the stakes of the contestants and, in turn, on their proposed policies and on their exerted lobbying or rent-seeking efforts. The important role of the political environment (the form of the government, its motivation and the decision rule it applies) is represented by the commonly used contest success function that specifies the relationship between the outcome of the contest and the proposed policies or the efforts of the interest groups.

As in Epstein and Nitzan (2002c), the workers and capital owners make two types of decisions. In the first stage of the game, the interest groups non-cooperatively select their proposed policies, the lobbying targets, Q_k and Q_w. In the second stage they engage in a contest over the approval of the proposed policies. The interest groups are assumed to pre-commit to their proposed policies and the commitments are feasible and are fully implemented after the contest.[11] The means of the workers and capital owners to affect the outcome of the contest, viz. their winning probabilities, in the second stage of the game is their lobbying or rent-seeking efforts x_k and x_w .[12] The approval of the policy proposals Q_k and Q_w imply different utilities for the two interest groups. The benefit of the capital owners is $v_k(Q_k)$, if its proposal is approved and $v_k(Q_w)$, if the workers' union proposal is approved. In a similar way, the benefit of the workers' union is $v_w(Q_w)$, if its proposal is approved and $v_w(Q_k)$, if the capital

[10] In a similar way, in the contest over monopoly regulation studied in Baik (1999), Ellingsen (1991) and Schmidt (1992), the monopoly firm is assumed to defend the status-quo, its profit- maximizing price (against any price regulation), while the consumers challenge the status-quo lobbying for the competitive price (a tight price cap).

[11] For different rent-seeking games with an explicit time structure that allow for such commitment, see Baik and Kim (1997), Baye and Shin (1999) and Dixit (1987).

[12] x_c and x_d are total lobbying efforts. An implicit assumption is thus made that the interest groups are able to fully overcome the free riding effects.

owners' proposal is approved. The workers' union's and the capital owner's expected payoffs are given by:

$$E(u_j) = \Pr_i v_j(Q_i) + \Pr_j v_j(Q_j) - x_j \quad \forall i \neq j,\ i, j = w, k \tag{1}$$

or,

$$E(u_j) = v_j(Q_i) + \Pr_j n_j(Q_j, Q_i) - x_j \quad \forall\ i \neq j,\ \ i, j = w, k\ . \tag{2}$$

where $n_j(Q_j, Q_i)$ is the stake of interest group *j*, that is, $n_k(Q_k, Q_w) = v_k(Q_k) - v_k(Q_w)$ and $n_w(Q_k, Q_w) = v_w(Q_w) - v_w(Q_k)$.

The utility functions v_k and v_w are assumed to be monotonic, continuous and twice differentiable on the interval $[Q_w^*, Q_k^*]$. Notice that when $Q_w = Q_k$ both stakes are equal to zero and that $\partial n_k / \partial Q_w < 0$ and $\partial n_w / \partial Q_k > 0$ on the interval $[Q_w^*, Q_k^*]$.

The function that specifies *i*'s probability of winning the contest, $\Pr_i(x_i, x_j)$, is usually referred to as a contest success function (CSF). This function is usually assumed to satisfy the following requirements, see Nitzan (1994) and Skaperdas (1996): $\Pr_k + \Pr_w = 1$ such that $\Pr_i(x_i, 0) = 1 \ \forall \ x_i > 0$, $0 < \Pr_i(x_i, x_j) < 1 \ \ \forall\ x_i, x_j > 0$, $\Pr_i(0,0) = 0.5$, $\dfrac{\partial \Pr_i(x_i, x_j)}{\partial x_i} > 0$, $\dfrac{\partial \Pr_i(x_i, x_j)}{\partial x_j} < 0$ and $\dfrac{\partial^2 \Pr_i(x_i, x_j)}{\partial x_i^2} < 0$ (the latter inequality ensures that the second order conditions are satisfied). Since $\Pr_i(x_i, x_j) + \Pr_j(x_j, x_i) = 1$, $\dfrac{\partial^2 \Pr_i(x_i, x_j)}{\partial x_i \partial x_j} = -\dfrac{\partial^2 \Pr_j(x_j, x_i)}{\partial x_i \partial x_j}$.

In our first two-stage game with complete information, a sub-game perfect equilibrium can be calculated by using a standard backward induction procedure. The equilibrium effort levels x_k^{**} and x_w^{**} are determined in the second stage. These equilibrium lobbying efforts, which are assumed to be interior and unique, satisfy the conditions: $\dfrac{\partial E(u_i)}{\partial x_i} = 0 \quad , \ i = w, k$, that is,

$$\Delta_i = \frac{\partial \Pr_i}{\partial x_i} N_i - 1 = 0 \quad , i = w,k \tag{3}$$

The interior equilibrium policy proposal Q^{**}_k and Q^{**}_w, which are determined in the first stage of the game, satisfy the conditions: $\frac{\partial E(u_i)}{\partial Q_i} = 0$, $i = w, k$. Given (3), these conditions can be written as follows:

$$\frac{\partial E(u_i)}{\partial Q_i} = \frac{\partial \Pr_i}{\partial x_j} \frac{\partial x_j}{\partial Q_i} n_i + \Pr_i \frac{\partial n_i}{\partial Q_i} = 0 \tag{4}$$

By the two main results in Epstein and Nitzan (2002a), as long as the two interest groups engage in a viable contest in the second stage of the game, in equilibrium they are induced to voluntarily moderate their proposals relative to their best policies when there is no opposition. Specifically, the equilibrium policies Q^{**}_k and Q^{**}_w satisfy: $Q^{**}_k < Q^{*}_k$ and $Q^{**}_w > Q^{*}_w$. Although polarization is reduced, it is not eliminated. That is, an equilibrium with completely converging proposed policies is impossible. To sum up,

Proposition 1*: Under uncertain effective lobbying with no government intervention in the proposal of the migration quota, the workers' union and the capital owners moderate their proposals. However, the equilibrium policy proposals do not coincide.*

The intuition for this result is as follows: If there is no opposition the capital owners choose the policy Q_k^*. In the presence of an opposition, the capital owners realize that lowering their proposal for migration quota below Q_k^* leads to a decrease in their payoff from winning the contest. But the more restrained proposal yields an increase in the payoff of the opponent and, in turn, a reduction in his stake that induces him to become less aggressive. The resulting decline in the workers' union's probability of winning the contest clearly benefits the capital owners. Since the latter favorable effect dominates the former unfavorable effect, the capital owners prefer to restrain their lobbying target, i.e., propose a policy below the migration quota of Q_k^*. A similar intuition explains the readiness of the workers' union, the defender of the

status-quo, to moderate its position by proposing a policy that exceeds Q_w. For both the workers and the capital owners, a deviation from any agreed upon compromise results in a first order increase in the expected payoff, $Pr_i(Q_i, Q^*)\, n_i(Q_i, Q_j)$, and a second order reduction in the expected payoff, $-x_i$. Consequently, both interest groups are induced to deviate from any agreed upon proposal and conflict is a necessary outcome of the interaction in our game.[13] Since there always remain effective incentives for the interest groups to engage in a viable contest, wasteful resources are expended in the second stage of the game. Note that the interest groups could, of course, increase their expected payoffs by agreeing to cut down their lobbying efforts by the same proportion. This implies that the equilibrium of the quota – determination game is inefficient.

4. The Effect of Government Intervention in Determining the Proposed Quota

Suppose now that the proposed migration quota is determined by the government (a bureaucrat) and not by the interest groups. In this alternative setting, the stakes of the two groups are equal to the utility differences of the interest groups corresponding to the status-quo and the proposed migration quotas. Given the status-quo quota[14], the stakes are denoted $n_j(Q)$, $j = w, k$. In general, the stakes of the contestants are different, that is, one of them has an advantage over the other in terms of his benefit from winning the contest. It is not clear which of the groups has a larger stake. The ratio n_w/n_k is a measure of the asymmetry between the stakes of the contestants. By the expressions in (3) that determines the equilibrium efforts of the players and, in turn, their probabilities of winning the contest and by the assumed properties of the CSF, it is clear that under a symmetric contest success function[15] $(\forall x_i, x_j, \Pr_i(x_i, x_j) = \Pr_j(x_j, x_i))$, the player with the higher stake makes a larger effort and has a higher probability of winning the contest.

A change in the proposed migration quota affects the stakes of the players and, therefore, their efforts and probability of winning the contest. Assuming that the

[13] A different result can be obtained if the interest groups are allowed to be risk averse or in a different one-time interaction setting, see Skaperdas (1992).
[14] The main result of this section is independent of the particular level of the status-quo quota.
[15] Such symmetry implies that the two players share an equal ability to convert effort into probability of winning the contest.

stake functions $n_i(Q)$ ($i = w,k$) are continuous and twice differentiable in the quota Q, let $n'_i = \frac{\partial n_i}{\partial Q}$. By assumption,

$$\frac{\partial n_w}{\partial Q} > 0 \; and \; \frac{\partial n_k}{\partial Q} > 0 \quad , if \quad Q_w^* \le Q \le Q_k^* \tag{5}$$

and

$$\frac{\partial n_w}{\partial Q} > 0 \; and \; \frac{\partial n_k}{\partial Q} = 0 \; , if \; Q_k^* < Q \tag{6}$$

That is, an increase in the migration quota increases the utility of the capital owners and, in turn, their stake. Such an increase also increases the local workers' stake because an increase in quota decreases the utility of the workers so they have more to lose if the proposal is approved. Usually, a certain number of migrants is beneficial to the workers, see, for example, Epstein and Hillman (2002) and Epstein (2002). To simplify the analysis, we confine our attention to quota proposals beyond the quantity that improves the local workers' utility. By (6), an increase in the number of migrants beyond Q_k^* is not beneficial to the capital owners, that is, an increase of the quota beyond Q_k^* has no effect on the capital owners' utility. Consequently, the producers would not employ more than Q_k^* foreign workers. We could envisage a situation where an increase in the number of migrants imposes a cost on the economy and, in particular, on the employers. This possibility, however, is also disregarded.

As in Epstein and Nitzan (2002c), anticipating the behavior of the interest groups in the second stage of the game, where the lobbying outlays are determined, the bureaucrat selects his strategy, that is, the proposed migration quota in the first stage of the game. In other words, he selects a policy proposal subject to the political constraint imposed by the ruling politician, namely, subject to the contest on the approval of his proposal. In general, the bureaucrat's objective function reflects mixed commitments to the enhancement of the public well being and to his own self interest, which is represented herein by the contestants' lobbying outlays. Hence his objective function *G(.)* is of the form

$$G(.)=\alpha\left(E\left(u_w\right)+E\left(u_k\right)\right)+\left(1-\alpha\right)X \tag{7}$$

where $E(u_w)$ and $E(u_k)$ are the expected net payoffs of the workers and the capital owners. The contestants' total lobbying outlays, $X = x_w + x_k$, represent either transfers to the government (the ruling politician and/or the regulator) or resources wasted in the contest. Note that taking into account the public interest is consistent with the politician being either benevolent or realistic (wishing to be re-elected).[16] The utility of the bureaucrat is thus a weighted function of both welfare, $E(u_w)+E(u_k)$, and the total amount of the lobbying outlays, X. The parameters α and (1-α) are the weights assigned to the components corresponding to the expected social welfare and the contestants' lobbying outlays. The optimal migration quotas in the non-strategic setting of section 2 are represented by points A and B in figure 2. The equilibrium quotas for the workers and the capital owners in the strategic game analyzed in the section 3 are represented, respectively, by points A' and B'. The equilibrium migration quota in the current game can be represented by a point like C, a point like D or by any other point on the utility possibility frontier of figure 2. A point like C implies that the intervention of the government in the proposal of the quota is compromise enhancing, both relative to the first non-strategic situation and relative to the strategic situation of the preceding section. A point like D implies that quota determination by the government may result in the approval of a quota that is more extreme both relative to Q_k* and Q_k**. The main concern of the analysis below is the question how does government intervention in the quota proposal affect the proposed quota.

The anticipated equilibrium lobbying efforts x_k^+ and x_w^+ that are determined in the second stage of the game are characterized by conditions (3). The condition characterizing the sub-game perfect equilibrium migration quota Q^+ (the quota that maximizes $G(.)$, given the anticipated lobbying outlays) is[17]:

$$\frac{\partial G(.)}{\partial Q} = \alpha \frac{\partial\left(E(u_k^+) + E(u_w^+)\right)}{\partial Q} + (1-\alpha)\frac{\partial X^+}{\partial Q} = 0 \qquad (8)$$

[16] In contrast to the recent literature on public policy determination in representative democracies, Grossman and Helpman (2001), Persson and Tabellini (200o), in our two-stage reduced-form public policy contest, the effect of the often elaborate relationship between the public well being and the probability of re-election on the behavior of the politician is disregarded.

[17] We assume that the second order condition holds.

To clarify the relationship between the bureaucrat's equilibrium migration quota Q^+ and the interest groups' equilibrium proposed quotas with no government intervention in the quota proposal, Q_w^{**} and Q_k^{**}, consider the first order condition (8) at the two migration quotas Q_w^{**} and Q_k^{**}.

$$\left.\frac{\partial G(.)}{\partial Q}\right|_{Q=Q_i^{**}} = \alpha \left.\frac{\partial\left(E(u_k)+E(u_w)\right)}{\partial\, Q}\right|_{Q=Q_i^{**}} + (1-\alpha)\left.\frac{\partial X}{\partial\, Q}\right|_{Q=Q_i^{**}},\ i = w, \text{k} \qquad (9)$$

By the definition of Q_w^{**} and Q_k^{**}, $\left.\frac{\partial E(u_w)}{\partial\, Q}\right|_{Q=Q_w^{**}} = 0$ and $\left.\frac{\partial E(u_k)}{\partial\, Q}\right|_{Q=Q_w^{**}} > 0$ whereas $\left.\frac{\partial E(u_w)}{\partial\, Q}\right|_{Q=Q_k^{**}} < 0$ and $\left.\frac{\partial E(u_k)}{\partial\, Q}\right|_{Q=Q_k^{**}} = 0$. For the bureaucrat's equilibrium policy to coincide with one of the interest groups' equilibrium policies Q_w^{**} or Q_k^{**}, one of the following equalities must be satisfied:

$$\left.\frac{\partial G(.)}{\partial Q}\right|_{Q=Q_i^{**}} = \alpha \left.\frac{\partial E(u_j)}{\partial\, Q}\right|_{Q=Q_i^{**}} + (1-\alpha)\left.\frac{\partial X}{\partial\, Q}\right|_{Q=Q_i^{**}} = 0,\quad i = w, \text{or i} = k \qquad (10)$$

or

$$\alpha \left.\frac{\partial E(u_j)}{\partial\, Q}\right|_{Q=Q_i^{**}} = -\,(1-\alpha)\left.\frac{\partial X}{\partial\, Q}\right|_{Q=Q_i^{**}},\ i = w, \text{or i} = k \qquad (11)$$

Given that α and $(1-\alpha)$ are the weights the bureaucrat assigns to social welfare and to the total lobbying outlays, condition (11) requires that the marginal value of the lobbying outlays must equal the marginal value of social welfare. By (11), if $\frac{\partial X}{\partial\, Q} > 0$, then the bureaucrat's equilibrium quota cannot coincide with the workers' equilibrium quota Q_w**. And if $\frac{\partial X}{\partial\, Q} < 0$, then the bureaucrat's equilibrium quota Q^+ cannot coincide with the capital owners' equilibrium quota Q_k**. The bureaucrat's

proposed quota Q^+ can be between Q_w^{**} and Q_k^{**}, and be represented by a point such as C in figure 2. In such a case government intervention enhances compromise. However, it is possible that Q^+ is higher than Q_k** or lower than Q_w**. The former situation occurs, that is, $Q^+ > Q^{**}_k$, if

$$\alpha \frac{\partial E\left(u_w\right)}{\partial Q}\bigg|_{Q=Q_k^{**}} > -(1-\alpha)\frac{\partial X}{\partial Q}\bigg|_{Q=Q_k^{**}} \qquad (12)$$

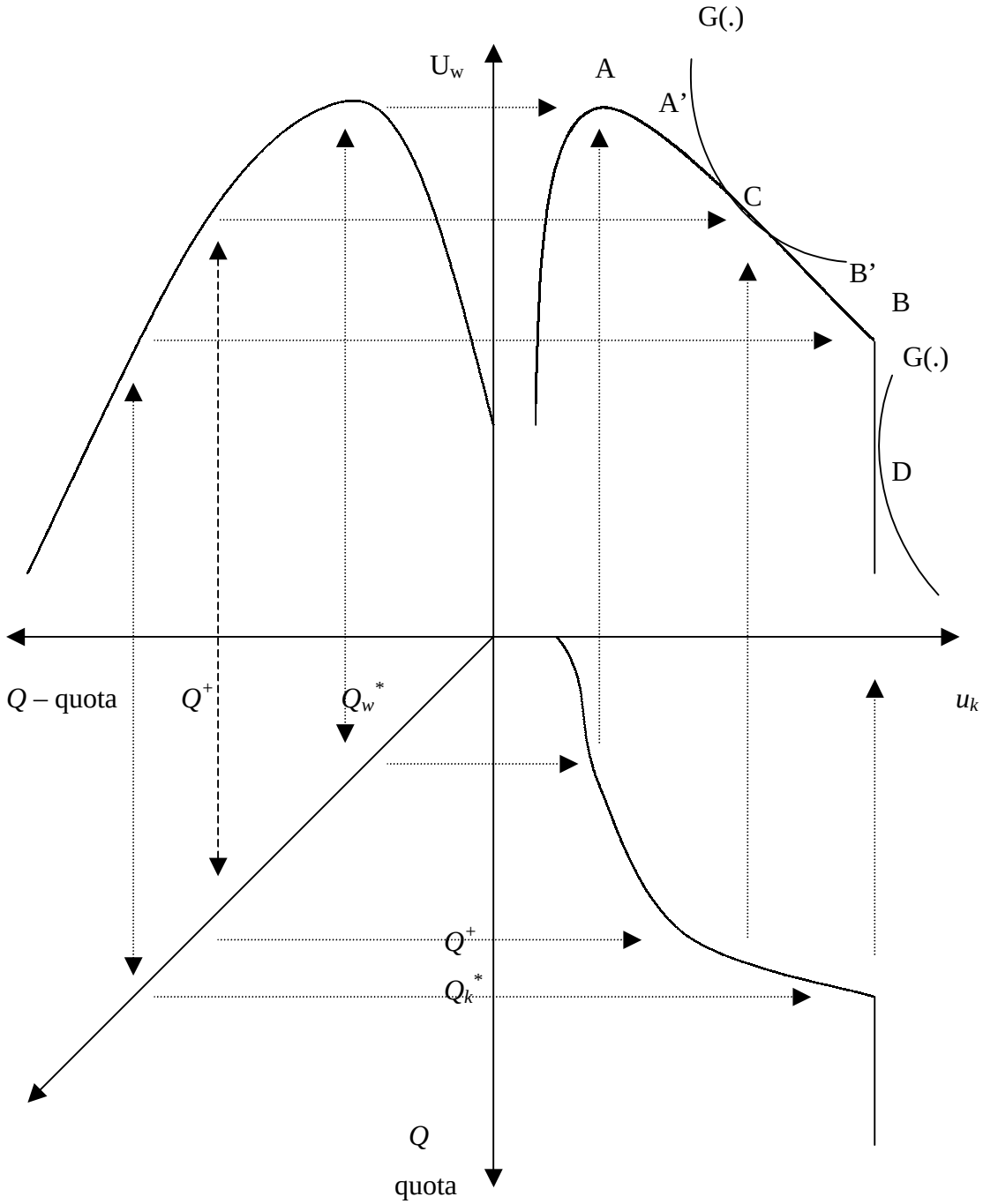
The latter situation occurs, that is, $Q^+ < Q_w$** if

$$\alpha \frac{\partial E\left(u_k\right)}{\partial Q}\bigg|_{Q=Q_w^{**}} < -(1-\alpha)\frac{\partial X}{\partial Q}\bigg|_{Q=Q_w^{**}} \qquad (13)$$

Therefore, to satisfy (12), it must be the case that $\left.\frac{\partial X}{\partial Q}\right|_{Q=Q_K^{**}} > 0$ and to satisfy (13), it must be that $\left.\frac{\partial X}{\partial Q}\right|_{Q=Q_w^{**}} < 0$.

As we can see, all the conditions stated above are related to the relationship between a change in the proposed policy and the change in the lobbying efforts of the contestants, $\frac{\partial X}{\partial Q}$. The effect of a change in the proposed quota may have a positive, negative or no effect on the lobbying oulays. In the appendix we present conditions that clarify the role of stakes-asymmetry and ability-asymmetry between the workers and the capital owners in determining the sign of $\frac{\partial X}{\partial Q}$. These conditions imply, in particular, that it is possible that the two contestants are induced to decrease their aggregate effort when the quota is increased. This occurs when the negative rival's-stake effect of the contestant who is induced to increase his effort more than counterbalances the sum of the two positive own-stake effects and his opponent's positive substitution effect. Notice that if the quota level is sufficiently high,

Figure 2



$Q_k^* < Q$, then aggregate effort may increase.

To sum up,

Proposition 2:

a. *If a change in the migration quota positively (negatively) affects the total lobbying efforts of the workers and the capital owners,* $\frac{\partial X}{\partial Q} > 0$ $\left(\frac{\partial X}{\partial Q} < 0\right)$*, then the bureaucrat's proposed quota cannot coincide with the workers ' (capital owners') proposed quota.*

b. *The bureaucrat's proposed quota can be more extreme than the quota proposed by the capital owners or by the workers.*

The proposition establishes that the proposed policy of the bureaucrat may coincide with one of the proposals of the interests groups. This depends on the effect a change in the proposal has on the total lobbying efforts exerted by the interest groups. Moreover, the proposal can be more extreme than that proposed by either interest group. For example, for the bureaucrat to propose a quota that is higher than the quota proposed by the capital owners, total lobbying outlays must be positively related to the proposed quota at the policy proposed by the capital owners. The intuitive rationale behind this result is that the bureaucrat will only choose such a policy if he benefits from the proposed increase in the quota. Remember that an increase in the quota does not change the capital owners' stake, however, it does increase the workers' stake, namely it makes them worse off. Yet, if such a proposal increases the lobbying outlays, the bureaucrat may still gain from such a proposal. Clearly, the bureaucrat can only gain from such a proposal, if the increase in the quota results in an increase in the lobbying efforts. Under such circumstances the capital owners prefer a quota that exceeds the one supported by the workers. The equilibrium migration quota proposed by the bureaucrat may well be higher (or lower) than the quotas preferred by both the workers and the capital owners.

When the migration quota is higher (lower) than that preferred by the capital owners, migrants or local workers will be unemployed (there will be a shortage of workers). In the case of a higher migration quota, the capital owners do not have to

employ the migrants and, therefore, as can be seen in figure 2, their utility is not reduced when the quota is increased.

Let us finally consider how does α, the weight assigned to social welfare, affect the proposed migration quota Q^{+}. Note that an increase in α implies a reduction in the weight assigned to the lobbying outlays. A decrease in α can be thus interpreted as an indication that the government becomes more politicized as it cares more about its narrow interest and less about the public well being. The bureaucrat who is a leading player maximizes *G(.)* being aware of the equilibrium lobbying outlays corresponding to the possible migration quotas. The first order condition that characterizes an interior sub-game perfect equilibrium quota proposal is stated in (8). This condition can be rewritten as

$$\frac{\partial\left(E\left(u_w\right)+E\left(u_k\right)\right)}{\partial Q}=-\frac{(1-\alpha)}{\alpha}\frac{\partial\left(x_w+x_k\right)}{\partial Q} \tag{14}$$

As in Epstein and Nitzan (2002b), it can be verified that $\frac{\partial Q}{\partial \alpha}=\frac{-\partial^2 G(.)/\partial Q\partial\alpha}{\partial^2 G(.)/\partial Q^2}$. By the second order condition, $\frac{\partial^2 G(.)}{\partial Q^2}<0$. Using the first order conditions, we therefore conclude that the derivative $\frac{\partial Q}{\partial \alpha}$ and the derivative $\frac{\partial X}{\partial Q}$ have opposite signs. That is, $Sign\left(\frac{\partial Q}{\partial \alpha}\right)=-Sign\left(\frac{\partial X}{\partial Q}\right)$. Hence,

Proposition 3

If a change in the quota positively (inversely) affects the total lobbying efforts, then a change in the weight assigned by the government to social welfare inversely (positively) affects the migration quota proposed by the bureaucrat.

This proposition emphasizes the critical significance of the sensitivity of *X* to variations in the proposed quota *Q* in determining the sensitivity of the optimal quota

policy Q to the parameter α. In particular, an increase in $(1-\alpha)$, the degree of politicization of the government, may result in an increase or a decrease in the proposed migration quota.

5. Concluding remarks

In this paper we analyze the endogenous determination of migration quota. We describe a contest between two interest groups, local workers (representing groups those that oppose migration) and capital owners who have different preferences regarding the migration quota. The capital owners prefer a larger quota than the workers. The two groups have conflicting interests regarding the approval or rejection of the proposed migration policy.

We began by identifying the non-strategic optimal quotas of the interest groups assuming that the proposed policy is independent of their behavior. We then introduced the first strategic game where the interest groups propose alternative quotas and the politician determines which policy is approved. In this setting the government does not intervene in the determination of the quota proposal. By the first proposition, the effect of lobbying on the random behavior of the politician is compromise enhancing. That is, both the workers and the capital owners moderate their proposals when lobbying affects the approval of their supported policies. However, even though lobbying induces the contestants to propose "closer" policies, the proposals do not coincide.

In contrast to the first result, the effect of government intervention in determining the proposed quota, on the nature of the quota is ambiguous. That is, when a bureaucrat proposes a migration quota, his proposed quota need not be compromise enhancing relative to the proposal of the workers or the capital owners in the previous case. The implemented quota can even be more extreme (higher) than the optimal quota of the capital owners in the non-strategic setting. Proposition 2 specifies the conditions that give rise to moderate and extreme quota determination by the government.

Finally we consider the effect of changes in the weight assigned by the bureaucrat to the public well being on the proposed quota. It has been shown that a decrease in the weight assigned by the bureaucrat to social welfare may increase or decrease the migration policy. The ambiguity is due to the ambiguity of the effect of

a change in the proposed migration policy on the total lobbying efforts of the workers and the capital owners in the contest over the approval or rejection of the proposed quota. The conditions resolving this ambiguity are derived in the appendix.

The struggle over migration policy is becoming a very important issue in the EU and in the US. Our results provide some preliminary insights into the economics behind the struggle over migration policy. In particular, they clarify the role of strategic lobbying, the role of government intervention in the determination of the proposed quota and the role of the nature of the government (the weight it assigns to social welfare relative to the lobbying outlays) on the migration quotas in different countries.

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Appendix

Using (4) with $Q_i = Q$ we obtain that the Nash equilibrium efforts satisfy the following conditions:

$$\frac{\partial x^{**}_i}{\partial Q} = \frac{n_i \frac{\partial^2 \Pr_i}{\partial x_i \partial x_j}\frac{\partial \Pr_j}{\partial x_j}\frac{\partial n_j}{\partial Q} - n_j \frac{\partial^2 \Pr_j}{\partial x_j^{\,2}}\frac{\partial \Pr_i}{\partial x_i}\frac{\partial n_i}{\partial Q}}{n_i n_j\left(\frac{\partial^2 \Pr_j}{\partial x_j^{\,2}}\frac{\partial^2 \Pr_i}{\partial x_i^{\,2}} - \frac{\partial^2 \Pr_i}{\partial x_i \partial x_j}\frac{\partial^2 \Pr_j}{\partial x_i \partial x_j}\right)} \quad , \; i \neq j, \;\; i, j = w, k \qquad \text{(a1)}$$

Rewriting (a1) together with the first order conditions, we obtain that:

$$\frac{\partial x^{**}_i}{\partial I} = \frac{1}{B}\frac{\partial^2 \Pr_i}{\partial x_i \partial x_j}\eta_j \, n_i - \frac{1}{B}\frac{\partial^2 \Pr_j}{\partial x_j^{\,2}}\eta_i \, n_j \quad , \; i \neq j, \;\; i, j = w, \, k \qquad \text{(a2)}$$

where $B = Q \, n_i \, n_j\left(\frac{\partial^2 \Pr_j}{\partial x_j^{\,2}}\frac{\partial^2 \Pr_i}{\partial x_i^{\,2}} - \frac{\partial^2 \Pr_i}{\partial x_i \partial x_j}\frac{\partial^2 \Pr_j}{\partial x_i \partial x_j}\right) > 0$ and $\eta_j = \frac{\partial n_i}{\partial Q}\frac{Q}{n_i}$. All values are computed at the Nash equilibrium. The effect of a change in the quota on the total effort invested in the contest by the capital owners and the workers, X^*, is given by:

$$\frac{\partial X^*}{\partial Q} = \frac{\partial x^*_k}{\partial Q} + \frac{\partial x^*_w}{\partial Q} = \qquad \text{(a3)}$$

$$\frac{1}{B}\left(\frac{\partial^2 \Pr_k}{\partial x_k \partial x_w}\left(\eta_L n_k - \eta_{kH} n_w\right) - \left(\frac{\partial^2 \Pr_k}{\partial x_k^{\,2}}\eta_w n_k + \frac{\partial^2 \Pr_w}{\partial x_w^{\,2}}\eta_k n_w\right)\right)$$

Hence,

If $Q_k^* > Q > Q_w^*$ then

$$\frac{\partial X^{**}}{\partial Q} \gtrless 0 \;\Leftrightarrow\; \frac{\partial^2 \Pr_k}{\partial x_k \partial x_w}\left(\eta_w n_k - \eta_k n_w\right) \gtrless \frac{\partial^2 \Pr_k}{\partial x_k^{\,2}}\eta_w n_k + \frac{\partial^2 \Pr_w}{\partial x_w^{\,2}}\eta_k n_w$$

and if $Q_k^* < Q$ then $\frac{\partial X^{**}}{\partial Q} \gtrless 0 \;\Leftrightarrow\; \frac{\frac{\partial^2 \Pr_k}{\partial x_k \partial x_w}}{-\frac{\partial^2 \Pr_k}{\partial x_k^{\,2}}} \gtrless -1$