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A MODEL OF INFLUENCE COMPETITION WITH MIGRATION

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In this paper, we extend the influence competition model proposed by Becker(1983) and Cairns(1989) into a more realistic one incorporating the possibility of losers taking the exit option. Our analysis begins with a key recognition that heterogeneity exists among the members of an interest group(in particular, losers); this plays a crucial role in determining the degree of mobility and the possible rents of interest groups, and hence in assessing the policy implications of political economy models. This extension turns out to be effective in understanding population issues in the political economy models.

1. INTRODUCTION

The simple observation that political action to secure a larger portion of the economic pie may be rationally selected by economic agents fundamentally changed the focus of economic analysis of public policy issues. This perspective, which we may call a political economy approach, has been exploited by economic analysts in every important public policy area. In most political economy models, however, it is implicitly assumed that the population of an interest group is independent of transfers.

As such, the assumption of a fixed population in these models may be unduly restrictive and in fact misleading when applied to some public policy issues. In reality, individuals may respond to disadvantageous government policies by migrating to other sectors. That is, they 'exit' rather than raise their 'voice'(Hirschman). Labor migration from rural to urban area under disadvantageous food policies is one example.

So long as interest groups are perfectly mobile, with zero adjustment costs and no entry barriers, there will not be consistent losers or gainers from government intervention. Further, there will be no incentive for predatory behavior since all rents will be dissipated. In fact, in this extreme situation the term "interest group" itself does not make much sense. Alternatively, assume that interest groups are completely immobile, as is done in most of political economy models(e.g. Becker(1983)). In

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this situation, gainers and losers of a policy are predetermined and well targeted. These models lack realism. First, the losers and gainers of a policy are not always well defined, nor do they have equal stakes. Moreover, they are not always organized nor homogeneous. For some losers(gainers), the subjective loss(gain) may be almost negligible. For them, costly political action is of no use. Second, these models neglect the role of third parties who are unaffected(or at least unmotivated to be directly involved in redistributive struggle) by the government intervention. The existence of these third parties leaves room for profitable exploitation of ideology and policy obfuscation for the government. Third, the initiative for political action and aggregation of interests is not addressed; intra group politics remains a black box. Political appeals action is usually taken by an interest group organization, and not by individuals who have a wide range of different incentives and motivations for involvement in politics.

Among those listed, the assumption of homogeneous individuals is a critical one. Heterogeneity of an interest group naturally leads to a rational choice problem for the members of that group. If government policies are consistent in their disfavor, the members of a losing group will calculate the benefits and costs of exiting. In that case, the adjustment cost is a key factor to be considered; in many cases, losers who are hurt more face larger adjustment costs. We may generalize the situation by assuming that the adjustment cost is not necessarily infinite nor zero.

To illustrate the importance of considering the exit option for losers, we build our model upon Becker(1983) and Cairns(1989) and show how the analysis may be changed by this new perspective. From Becker(1983), we borrow the idea of a Cournot-Nash solution to a static redistributive game. From Cairns(1989), who presents a dynamic issues involved in transfer politics. A notable weakness of their models is that individuals are essentially treated as being homogeneous; hence the possibility of migration from one group to another cannot be discussed. The objective of this paper is to develop a model which may capture the idea of the heterogeneity of individuals and make it possible to discuss the issue of migration in transfer politics.

2. BACKER-CAIRNS MODEL

As in Cairns(1989), assume n groups and that net subsidy(net tax if negative) transferred to an interest group depends on its political influence exceeding its normal level of influence which is defined as its population ratio. Total population is N and the population of the ith group is Ni. Then, following Cairns(1989), we assume[1)]

$$(1)\ NS^i(A^i) = I^i - \frac{N^i}{N}$$

$$S^i(0)=0,\ S^{i'} > 1,\ (0<S^{i'}<1)\ S^{i''}>(<)0,\ \text{for } A^i>(<)0$$

1) Note that from his definition of S, negative values of A cannot guarantee the same signs or magnitudes of first and second derivatives of S as positive values of A. He did not recognize this problem in his definition of S.

where I^i represents the political influence of the ith group, A is the average net subsidy or tax and S is a function representing a transformation curve of transferred resources into the actual cost of that transfer. This equation implies that the net subsidy to the ith group is directly equal to the amount of excessive political influence of that group.[2] As S is monotonic, we may express

$$(2)\ A^i=(S^i)^{-1}\left(\frac{I^i}{N^i}-\frac{1}{N}\right)=\Psi^i(z^i),\ \Psi^i(0)=0,\ \Psi^{i\prime}>0,\ \Psi^{i\prime\prime}<0 \text{ for } z^i\neq 0$$

To illustrate the effect of the deadweight loss, we may add a variable representing the degree of transfer efficiency.

$$(2')\ A^i=\Psi^i(z^i,\delta^i),\ \frac{\partial \Psi^i}{\partial \delta^i}<0$$

where δ^i represents the degree of deadweight loss involved in the transfer;a large δ^i implies less efficiency in the transfer and hence less transfer received, given z^i.

Since the net collection of tax should be equal to the net transfer,

$$(3)\ \sum N^i S^i(A^i)=0$$

The political influence of the ith group depends on its total expenditures, previous influence and the population of that group, under given political influences of other groups. We may add a variable (b_t^i) to index the effectiveness of rent seeking of that group.[3]

$$(4)\ I_t^i=I_t^i(\overset{(+)}{I_{t-1}^i},\ \overset{(+)}{a_{t-1}^i N^i},\ \overset{(-)}{N^i},\ \overset{(+)}{b_t^i};\ a_{t-1}^j N^j,\ N^j;),\ j\neq i,\ t=1,2$$

where a^i represents the per-capita expenditure of the ith group and the subscripts denote time. assume that rent seekers seek to maximize the discounted expected utility(suppressing the superscripts):

$$(5)\ \max_{a_1, a_2} L=u_1(\alpha_1\overline{Y}(1+g_1)+\Psi_1(z_1)-a_1) + \frac{1}{1+r}u_2(\alpha_2\overline{Y}(1+g_1)(1+g_2)+\Psi_2(z_2)-a_2)$$

where $\overline{Y}$, α, g, r represent the total initial national income, the income share of a representative rent seeker, the realized or perceived growth rate of national income and the discount rate, respectively. For simplicity, the population and the income share of groups are assumed to be exogenously given and there is no uncertainty. Note also that

2) This assumption is just for a simple exposition. Any positive function will do the same job.

3) Cairns(1989) distinguishes two cases;effectiveness and merit. These are related to the sign of $\partial^2 I^i/\partial a^i \partial b^i$. If it is positive, the group is "effective"(increasing returns). If negative, the group deserves the merit but, at the margin, gains comparatively less by increasing expenditure than if it were less deserving.

$$(6)\ \bar{z}_1^1 = \frac{\bar{I}_1^1}{N^1} - \frac{1}{N^1},\ \bar{I}_1^1 = \bar{I}_1^1(I_0^1,\ \bar{a}_0^1 N^1,\ N^1,\ b_1^1)$$

i.e. today's choice of political expenditure cannot affect today's transfer. The F.O.C. becomes

$$(7)\ Z = \frac{\partial L}{\partial a_1} = -u_1' + \frac{1}{1+r} u_2' \Psi_2' \frac{\partial I_2}{\partial m_1} = 0,\ m_1 = a_1 N^1$$

Let a_1^* slove (7). Note that for any exogenous variable x,[4]

$$(8)\ \frac{\partial Z}{\partial x} > 0 \rightarrow \frac{a_1^*}{\partial x} > 0$$

Several comparative statics can be derived from this simple formulation.

$$(\mathrm{R1})\ \frac{\partial a_1^*}{\partial \alpha_2} < 0,\ \frac{\partial a_1^*}{\partial g_2} < 0,\ \frac{\partial a_1^*}{\partial r} < 0$$

$$(\mathrm{R2})\ \frac{\partial a_1^*}{\partial \bar{Y}} <0> \text{iff } (1+g_2)\frac{R_2}{R_1} >(<) 1,\ \frac{\partial a_1^*}{\partial a_1^i} >(<) 0 \ \text{ iff } \frac{\partial I_2}{\partial m_1^i} <(>) 0$$

where R^a represents the absolute risk aversion of the representative individual. From these, we propose

Proposition 1. *The larger the expected economic growth, income share and the discount rate, the smaller will be the political expenditures today.*

This proposition is derived from a very simple version when compared with that in Cairns(1989). An interpretation of this proposition is that the decline in economic growth may be the cause of a perceived increase in rent-seeking. In this model, a key to this hypothesis is the assumption of decreasing marginal utility of income ;positive economic growth in the future will increase the expected income of rent seekers and this in turn will decrease the profitability of political expenditure today in utility terms. As political *investment* is made by sacrificing current income, an income increase in the second period will encourage people to "smooth" their income by reducing the level of rent seeking. The opposite case also holds : negative future economic growth will increase the level of rent seeking. This logic will similarly apply to the case of an increase in the discount rate. Therefore, this proposition says simply that political expenditures are indeed an investment.

4) This can be shown by a simple algebra. Let $L = f(a;x)$ $(f_a > 0, f_{aa} < 0)$. Then, $Z = f_a(a;x) = 0 \Rightarrow a = a^*(x)$. Hence $f_{aa}\frac{\partial a^*}{\partial x} + \frac{\partial Z}{\partial x} = 0 \Rightarrow \mathrm{sign}(\frac{\partial Z}{\partial x}) = \mathrm{sign}(\frac{\partial a^*}{\partial x})$.

We also find that if the absolute risk aversion multiplied by the gross economic growth rate in the second period is greater(smaller) than the risk aversion in the first period, the larger the initial national income, the more(less) the rent seekers will be currently involved in transfer politics. Note that the income share is assumed to be exogenously given in this model. Hence an increase in the initial national income will increase both current and future incomes. Therefore, the pattern of "smoothing" income depends on the level of risk aversions in both periods.

(R2) states that, in this Cournot-Nash model, the effect of an increase in the current political expenditures of the jth group on those of the ith group will depend on the character of the relationship between the two interest groups. If they are complementary to each other, and hence jth expenditure increases ith political influence, the ith group will find it less profitable to increase its expenditure. Similarly, if they are competitors, the ith group will find it more profitable to increase its expenditures.

From(7), we find

$$\text{(R3)}\quad \frac{\partial Z}{\partial N} > (<) 0 \text{ iff } \frac{\Psi_2'}{\Psi_1'}\left(\frac{R_2}{R_1} + \frac{\Psi_2''}{R_1\Psi_2'}\right) > (<)\ 1$$

i.e., the effect of population on transfer politics depends on risk aversions in the present and future periods and the first and second derivatives of transfer functions in both periods. From (2′), we derive

$$\text{(R4)}\quad \frac{\partial Z}{\partial \delta} = -u_1''\frac{\partial \Psi_1}{\partial \delta} + \frac{1}{1+r}\left\{\frac{\partial \Psi_2}{\partial z}u_2''\frac{\partial \Psi_2}{\partial \delta} + u_2'\frac{\partial^2 \Psi_2}{\partial \delta\,\partial z}\right\}\frac{\partial I_2}{\partial m_1}$$

i.e., an increase in deadweight loss will provide an incentive for individuals to decrease political expenditures in the first period. while it will augment the profitability of those in the second period unless the marginal transfer of political influence decreases with deadweight loss. The overall effect will depend on the relative strength of these two effects.

All of these results are derived under exogenously defined interest groups with no feasibility of exit options among the members of them. The next section endogenizes the group size and incorporates the possibility of migration among interest groups.

3. A MODEL OF ENDOGENOUS GROUP SIZE : EXIT VS. VOICE

In this section, we endogenize the size of interest groups. To illustrate the case in the simplest way, we assume $n=2$. In this section, we analyze the case in which members of an interest group may exit and become members of the other group. To introduce the heterogeneity of members, we label the individuals of each group with variable h such that a large h means that the individual has large asset fixity, and hence bears a large adjustment cost if she/he opts to migrate. Since $n=2$, we may assume that group 1 is reserved for gainers and group 2 for losers. Since we introduce the heterogeneity of individuals, it is convenient to express(1) as

$$(9)\ S(R)=I-\frac{M}{N}, S'>1,\ S''>0,\ T(\tilde{R})=\tilde{z}=\frac{\tilde{M}}{N}-\tilde{I},\ 0<T'<1,\ T''<0$$

where $R(\tilde{R})$ represents the total transfer to(from) group 1(2), $M(\tilde{M})$ is its population. Then, as before, we derive

$$(10)\ R=\Psi(z),\ z=I-\frac{M}{N},\ \Psi(0)=0,\ \Psi'>0,\ \Psi''<0,\ \text{for } z>0$$

Similary, for group 2,

$$(10')\ \tilde{R}=\tilde{\Psi}(\tilde{z}),\ \tilde{\Psi}(0)=0, \tilde{\Psi}'>0, \tilde{\Psi}''>0\ \text{ for } \tilde{z}>0$$

where superscript ~ represents the corresponding variables for group 2 and $M+\tilde{M}=N$. Note that group 2 is paying net tax and that their tax payments at the margin are actually larger than their loss in political influence due to deadweight loss. We also assume that the influence functions have the form of

$$(11)\ I_t=I_t(I_{t-1},\ m_t,\ M_t,\ \tilde{I}_t\,;b_t),\ \tilde{I}_t=\tilde{I}_t(\tilde{I}_{t-1},\ \tilde{m},\ N-M_t,\ I_t\,;\tilde{b}_t)$$

for group 1 and 2 respectively. Since resources used for subsidy should equal net tax, we require

$$(12)\ S(R)=T(\tilde{R})\Rightarrow\tilde{R}=\Phi(R), \Phi'=\frac{S'}{T'}>1(S'>1,\ T'<1), \Phi''=\frac{T'S''-S'T''}{(T')^2}>0$$

From (10) and (11), we get $I+\tilde{I}=1$, that is, each group's influence is normalized to sum to one. Assume that the cost of political action will be equally distributed across the individuals in a group. Two possibilities may be pursued to characterize the burden of the net tax imposed for an individual in group 2;the average or a tax proportional to the degree of her asset fixity. Here we only consider the first case since the qualitative results are not different even if we use the second case.

If an individual $\tilde{h}$ of the suffering group(i.e. group 2) chooses to migrate, she may expect to earn the average net subsidy enjoyed by the beneficiary group(i.e. group 2). We assume that the net tax imposed is also an average for each individual and independent of her income share or asset fixity. In this case, for an individual $\tilde{h}$, the net benefit of choosing the exit option is

$$(13)\ NB=[\alpha^{\tilde{h}}Y+\frac{R}{M}-C^{\tilde{h}}-a^{\tilde{h}}]-[\alpha^{\tilde{h}}Y-\frac{\tilde{R}}{\tilde{M}}-\tilde{a}^{\tilde{h}}]$$

where $C^{\tilde{h}}$ is the adjustment cost of moving, $a^{\tilde{h}}$ is her share of political expenditure if in group 1 and Y is national income. The first bracket shows the alternative possible income for her when she takes the exit option, while the second bracket represents her income in the status quo. Here we assume that if $\tilde{h}$ decides to migrate, she will get the same income share as before.[5] Migration will happen until net benefit of mi-

5) This assumption implies that the pure transfer motive is prevalent in migratory behaviors.

gration becomes zero(for an individual h*)[6].

$$(14)\ NB=0, \text{if } h=\tilde{h}^* \Rightarrow \frac{R-m}{M}+\frac{\tilde{R}+\tilde{m}}{\tilde{M}}=\dot{C}^h,\quad \dot{a}^h=\frac{m}{M},\ \dot{\tilde{a}}^h=\frac{\tilde{m}}{\tilde{M}}$$

where m represents the total political expenditure. The adjustment cost has the form of

$$(15)\ \tilde{C}^h=c+\beta h,\ \beta, c>0$$

where c represents the constant cost of moving and β represents the variable cost proportional to one's ownership of fixed assets.[7] From (14) and (15), we get[8]

$$(16)\ h^*=\frac{1}{\beta}\left[\left(\frac{R-m}{M}+\frac{\tilde{R}+\tilde{m}}{\tilde{M}}\right)\Bigg|_{\tilde{h}=0}-c\right]$$

Hence to get an interior solution for h, we require[9]

$$(C1)\ \left(\frac{R-m}{M}+\frac{R+m}{M}\right)\Bigg|_{\tilde{h}=0}>c$$

This condition means that the constant portion of adjustment cost should not be greater than the sum of net(i.e. net of political expenditure) average subsidy and net average tax to trigger migration. Introducing the time subscript, we get

$$(17)\ dR_2=\Psi_2'\left[\frac{\partial I_2}{\partial m_1}dm_1-\frac{\partial \tilde{I}_2}{\partial \tilde{m}_1}d\tilde{m}_1-Ddh\right], D=\left\{-\frac{\partial \tilde{I}_2}{\partial \tilde{M}_2}-\frac{\partial \tilde{I}_2}{\partial \tilde{M}_2}+\frac{1}{N}\right\}>0$$

by exploiting the fact that $dM=dh^*$, $d\tilde{M}_2=-dh^*$ and $\partial I_2/\partial \tilde{I}_2=-1$. Also note that $dR_2=\Phi_2' dR_2$. We get

6) Note that the net subsidy and tax will not vanish even though NB=0. NB=0 only means that the benefit and cost of migration for the marginal migrant will be equal.

7) In fact, this representation is unduly restrictive; we may generally assume that $c^h=c+\beta\alpha(\tilde{h})$ where α is the degree of asset fixity and we only need $\alpha'>0$. But since this representation makes the analysis less transparent, we heuristically assumed here that $\alpha=h$, $\alpha'=1$. In this interpretation, β represents the marginal cost of adjustment with respect to the asset fixity roughly defined, as well as the marginal cost of adjustment with respect to the heterogeneous individuals in the losers group.

8) The time sequence is as follows. Given political influence(predetermined) and net subsidy and tax of period 1, each group decides on its optimal m of period 1 after calculating its effect on migration, which will affect the level of net subsidy and tax in period 2. Individuals in group 2 decide on whether to exit after calculating the cost and benefit.

9) The condition is required to guarantee a positive net benefit of migration for the migrant with least cost.

$$\text{(R5)}\quad \frac{dh^*}{dm_1}=\frac{G}{H}\frac{\partial I_2}{\partial m_1}>0,\ \frac{dh^*}{d\tilde{m}_2}=-\frac{G}{H}\frac{\partial \tilde{I}_2}{\partial \tilde{m}_2},\ \frac{dh^*}{dc}=-\frac{1}{H}<0,\ \frac{dh^*}{d\beta}=-\frac{h}{H}<0$$

if $H>0$, where

$$\text{(18)}\quad G=[\frac{1}{M}+\frac{1}{\tilde{M}}\Phi_2']\Psi_2'>0,\ H=U+DG,\ U=\beta+\frac{R_2-m_2}{M_2^2}-\frac{\tilde{R}_2+\tilde{m}_2}{\tilde{M}_2^2}$$

$$\text{and}\ \frac{\partial NB}{\partial \tilde{h}}=-H$$

Note that H consists of three differnet effects. First, DG represents the direct effect of migration on the net subsidy and tax. In particular, D consists of two composite effects; i) influence effects of population redistribution caused by migration(i.e. free-rider problem) and ii) the effect of migration on the normal level of influence and hence on net subsidy and tax. Second, U consists of two different effects : the variable adjustment cost effect and the effect on the *average* net subsidy and tax of migration. The latter effect is through the denominator of the average net subsidy and tax. Since DG is positive, H is positive unless the average net tax effect of migration is high enough(i.e., unless migration causes a great increase in the net burden of tax shouldered on individuals of group 2) and the variable cost of adjustment is small enough. The condition that H be positive is required in order to have a stable migration equilibrium. Under extreme cases, however, this condition may not hold. For instance, assume that the marginal free riding effect(caused by migration) is negligible, the total population is very large and hence DG is almost zero. Then, if the population of losers and the variable cost of adjustment is small enough, H may be negative.(Note that the net tax is always greater than the net subsidy due to deadweight losses). In this situation, triggered migration will not be stabilized[10] and the equilibrium will not be achieved unless all the losers migrate. For a meaningful analysis, we assume H is positive. Then, we find

Propositon 2 *Migration will increase if the gainers' political investment increases, and decrease if the losers' political investment increases.*

which clearly follows our intuition. As before, assume that individuals maximize net expected utility. Since individuals are heterogeneous, however, we introduce a hypothetical benevolent dictator(or the center of the organization formed to initiate political campaign) in each group who maximizes her expected utility defined over the aggregate income transfer to that group. For the dictator of group 1, the problem is to

10) This can be easily seen by noting that the(negative) slope of marginal cost curve of migration is steeper than marginal benefit curve, if H is negative.

$$(19)\ \max_{m_1}\ u_1(R_1-m_1)+\frac{1}{1+r}u_2(R_2-m_2)$$

In this case, we assume that the dictator is only interested in the net transfer, not in total income. This enables us to focus only on the problem of redistributional issues arising from transfer politics[11]. The F.O.C. is

$$(20)\ Z_1=-u_1'+\frac{1}{1+r}u_2'\Psi_2'\frac{\partial I_2}{\partial m_1}\left[\frac{U}{H}\right]=0$$

by using(18). Hence, for an interior solution, we require

$$(C2)\ U>0,\ \text{i.e. } \beta>\left.\frac{\tilde{R}_2+\tilde{m}_2}{\tilde{M}_2^2}-\frac{R_2-m_2}{M_2^2}\right|_{\tilde{h}=h^*}$$

Note that this condition is not necessarily required for the stability of migration equilibrium. Similarly, for the benevolent dictator of group 2, the problem is to

$$(21)\ \max_{\tilde{m}_1}\ \tilde{u}_1(-\Phi_1(R)-\tilde{m}_1)+\frac{1}{1+\tilde{r}}\tilde{u}_2(-\Phi_2(R)-\tilde{m}_2)$$

The F.O.C. is

$$(22)\ \tilde{Z}_1=-\tilde{u}_1'+\frac{1}{1+\tilde{r}}\tilde{u}_2'\Phi_2'\Psi_2'\frac{\partial \tilde{I}_2}{\partial \tilde{m}_1}\left[\frac{U}{H}\right]=0$$

by using(18). Hence, we derive the same requirement for the interior solution as before. Roughly speaking, the variable cost of adjustment will act like a "brake" in triggered migration. If this brake is too weak, the benefit of political investment may be dominated by its cost caused by the triggered migration. This does not only apply to the gainers group but also to the losers group, since the political investment at the margin will prevent the overflow of migration and hence will be harmful to the individuals remaining in the losers group.

Remember that the level of political activity for each group is much like an investment. For gainers, the investment in the first period is expected to bring more net subsidy in the second period. The net subsidy in the second period depends on political influence exceeding the normal level of influence of gainers. Under trig-

11) This assumption is made since migration also changes the portion of income share of a group in GNP; if we introduce total income as an argument in the objective function, we face a problem of aggregation and the interpretation of the objective becomes somewhat ambiguous.

gered migration, this depends on the relative strength of the direct positive influence of an increase in political expenditures, relative to the negative influence due to population redistribution. The latter effect is cancelled out because of the migration effect of political expenditure(derived from migration equilibrium), and leaves only the population redistribution effect on the averages of net subsidy and tax("divisor effect"). In this case, the stability(or the existence of an interior solution of political expenditure) condition requires that the marginal benefit decrease (variable adjustment cost plus net subsidy divisor effect) should be larger than the marginal cost decreas(net tax divisor effect) due to migration.[12] Since net taxes imposed on losers are always greater than net subsidies received by gainers due to deadweight losses involved in the transfer, the condition can only be met with a large enough variable cost of adjustment, unless the population of gainers after migration is small enough.

We also note that the population ratio between the losers group and gainers group plays an interesting role in (C2). In particular,

$$\text{(C3) } U>0 \text{ if } \frac{AT_2}{AR_2}<\frac{\tilde{M}_2}{M_2},\ AT_2=\frac{\tilde{R}_2+\tilde{m}_2}{\tilde{M}_2},\ AR_2=\frac{R_2-m_2}{M_2}$$

i.e. if the population ratio of losers over gainers is smaller than the average net tax imposed on losers over the average net subsidy received by gainers after migration, there will be no incentive for political investments of losers and gainers, unless the variable cost of adjustment is large enough. This amplifies the importance of considering population issues arising in political economy models. Becker, for instance, argues that politically successful groups tend to be small relative to the size of the groups taxed to pay their subsidies(1983). But, in reality, we find many cases in which large and unorganized groups appear to gain.[13] Our model provides hints to this puzzle. Assume that the constant portion of adjustment cost of the members of a suffering group is small enough and hence there exists the possibility to exit and to join beneficiary groups.[14] Gainers expect that their population will increase if they invest more in transfer politics. Say, for instance, the variable cost of adjustment is extremely small, implying that an almost identical adjustment cost will be shouldered by losers if they opt to migrate. This in turn implies that the gainers will gain little if their political investment triggers migration. If the expected future population ratio of losers over gainers is less than the average loss over the average gain, there will not exist any incentive for the gainers(and hence losers) to invest in transfer politics. This situation may be defined as the case of "no short-run dynamic influence competition "under mobility. Under this situation, it is not hard to see the case in which a large

12) Note that population redistribution effect on political influence and hence on net subsidy and tax is cancelled out and only its effect on the average is in question.

13) For a clear example of this we may cite rent controls.

14) In fact, the constant cost, which may include exit and entry costs, may be strategically manipulated by governmental policies in various ways.

unorganized group seems to be protected for various other reasons in the supply side.

Graphically, this proposition may be summarized by figure 1, using the net benefit (NB) curve of migration and the net subsidy curve, defined on the level of migration. For a simple graphical exposition, we exploit linear curves to show the key intuition of the result described in the proposition. If β is small enough to make U negative, the slope of NB will become smaller(since H will be smaller) and the equilibrium h^* will become larger(see (R5)). Note that R is a decreasing function of $\tilde{h}$ and an increase in $m(\tilde{m})$ will increase (decreas) R, but with a countering effect as $\tilde{h}$ increases. In this situation, we may derive a case in which the increasing political investment of gainers may actually decrease the level of transfers to them. Similarly, we may find that the political investment of losers may actually increase the level of transfers and hence the level of tax shouldered by them.

To assess the effect of exogenous variables on the level of transfer, we may define

$$\text{(2A)}\ R = \Psi(z, x)$$

where x represents exogenous variables which may affect the level of subsidy given z. From (20), we get(assuming an interior solution of m_1, i.e. $U>0$, $H>0$ and that the cross partial of the transfer function is negligible),

$$\text{(R6)}\ \frac{\partial Z_1}{\partial x}<0, \text{ if } \frac{\tilde{M}_2^2}{M_2^2}<\Phi_2', \frac{\partial \Psi_2}{\partial x}>0 \text{ or if } R_2^a>\frac{DG}{HU}\frac{1}{M_2^2}, \frac{\partial \Psi_2}{\partial x}>0$$

For instance, let x be the expected growth rate of the economy. In general, economic growth will bring an increase in the amount of transfer given political influence. If this holds, then expected economic growth will provide less incentive for investment in transfer politics for the gainers unless the population(or the absolute risk aversion) of gainers is small enough. Note that this result is derived under the condition that the interest of the hypothetical benevolent dictator of each interest group in the face of migratory behaviors lies only in transfer income(cf. Cairns(1989) and (R1)). Hence the mechanism of the result is quite different from that of Cairns. As we explained earlier, Cairns' result relies heavily on the assumption of decreasing marginal utility of income without referring to the mechanism of transfer politics,[15] while our result described in the proposition comes directly from the recognition of the effect of economic growth on transfer politics.

If x lowers transfer income under given political influence of gainers(for instance, an increase in deadweight loss), (R6) will be read

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15) Note that in Cairns model economic growth is assumed to increase the *initial income before transfer*, rather than transfer income itself, which triggers intertemporal adjustment in investment.

$$\text{(R7)}\ \frac{\partial m_1}{\partial x}>0,\ \text{if}\ \frac{\tilde{M}_2^2}{M_2^2}<\Phi_2'\ \text{or}\ R_2^a>\frac{DG}{HU}\frac{1}{M_2^2}\frac{\partial \Psi_2}{\partial x}<0$$

In other words, if the cross partial is negligible, the result will be as follows : If the population of gainers(or the absoulte risk aversion of gainers) is large enough, the expected increase in deadweight cost involved in the future transfer will provide more incentive for gainers to invest in influence competition.

Note that this result only concerns the *expected increase* in deadweight cost in the second period as compared with that in the first period(cf : (R2)).

In Cairns model, since the exit option for losers is nonexistent and individuals are homogeneous, the results do not distinguish losers from gainers. In contrast, for losers, we find(if the cross partial is negligible)

$$\text{(R8)}\ \frac{\partial \tilde{Z}_1}{\partial x}>(<)\,0\ \text{if}\ \frac{\partial \Psi_2}{\partial x}>0,\ \frac{\Phi_2''}{\Phi_2'}\left(\frac{U}{H}+\frac{D}{HM_2}\frac{\partial \Psi_2}{\partial z}\right)>(<)\,\tilde{R}_2^a,\ \frac{\tilde{M}_2^2}{M_2^2}>(<)\Phi_2'$$

$$\text{or}\quad \text{if}\ \frac{\partial \Psi_2}{\partial x}<0,\ \frac{\Phi_2''}{\Phi_2'}\left(\frac{U}{H}+\frac{D}{HM^2}\frac{\partial \Psi_2}{\partial z}\right)<(>)\,\tilde{R}_2^a,\ \frac{\tilde{M}_2^2}{M_2^2}<(>)\Phi_2'$$

Hence, if both the absolute risk aversion of losers and the population of gainers are small(large) enough, the expected economic growth in the future will increase (decrease) the political investment of losers today and the expected increase in the deadweight loss in future transfers will decrease(increase) the political investment of losers today. Note that the conditions for losers are more restrictive. We also find that if losers choose to decrease their political investments under an exogenous shock which increase transfers given political influence(for instance, economic growth), the gainers will also choose to decrease theirs, but not vice versa. Similarly, if losers choose to increase their political investments under an exogenous shock which lowers transfers given political influence(for instance, an increase in deadweight cost), the gainers will also choose to increase theirs, but not vice versa. This remark implies that proposition 1, derived from a model without migration may be misleading;economic growth may in general lower the gainers' involvement in transfer politics unless the population of gainers is very small compared with that of losers(note that it is possible to get $\partial m_1/\partial g<0$ even if $(\tilde{M}_2^2/M_2^2>\Phi_2')$). However, it is possible that this growth may augment the political investment of losers (for instance, if the population of losers after migration is still large enough and the hypothetical dictator's absolute risk aversion is small enough). This remark also implies that the losers' response to an exogenous shock on the transfer function will be an indicator to assess the expected level of future transfer politics and the economic impacts from it.

How about the case when the dictator is interested in the average tax burden and the average subsidy in each group? In this case, (19), (21) becomes

$$(23)\ \max_{m_1} u_1\left(\frac{R_1-m_1}{M_1}\right)+\frac{1}{1+r}u_2\left(\frac{R_2-m_2}{M_2}\right)$$

$$(24)\ \max_{\tilde{m}_1} \tilde{u}_1\left(\frac{-\Phi_1(R)-\tilde{m}_1}{\tilde{M}_1}\right)+\frac{1}{1+\tilde{r}}\tilde{u}_2\left(\frac{-\Phi_2(R)-\tilde{m}_2}{\tilde{M}_2}\right)$$

Hence, the F.O.C. becomes

$$(25)\ Z_2=-\frac{1}{M_1}u_1'+\frac{1}{1+r}u_2'\frac{1}{M_2}\frac{\partial I_2}{\partial m_1}[\Psi_2' U_1-\frac{(R_2-m_2)}{M_2}G_1]=0$$

To get an interior solution, we require

$$(C4)\ \beta>\tilde{\gamma}_M\tilde{R}_2[1+\frac{h(2\tilde{M}_2+1)}{\tilde{M}_2(\tilde{M}_2+1)}]+\frac{(R_2-m_2)}{M_2}h\tilde{\gamma}_M\Phi_2'+\frac{\tilde{m}_2}{\tilde{M}_2^2}$$

Similarly, we get

$$(26)\ \tilde{Z}_2=-\frac{1}{\tilde{M}_1}\tilde{u}_1'+\frac{\tilde{u}_2'}{1+\tilde{r}}\frac{1}{\tilde{M}_2H_1}\frac{\partial\tilde{I}_2}{\partial\tilde{m}_1}[\{\Phi_2'\Psi_2'U_1+\frac{1}{\tilde{M}_2}(\tilde{R}_2+\tilde{m}_2)G_1]=0$$

To get an interior solution,

$$(C5)\ \Phi_2'\Psi_2'U_1+\frac{1}{\tilde{M}_2}(\tilde{R}_2+\tilde{m}_2)G_1>0$$

Note that for the interior solution for gainers, we require a high value of the variable cost of adjustment, while for losers, there will almost always be an interior solution regardless of the value of β This is true, for instance, if the population of gainers after migration is not dominant. These conditions imply that if the objective of a group is to maximize the *average* net subsidy(or minimize the *average* net tax), losers will be likely to be interested in transfer politics, while gainers will not unless the varialbe cost of adjustment of migrants is high enough. Explaining this story is not that difficult. As the objective is the average rather than the total, migration will be harmful to both losers and gainers in average terms(migration will increase the net average tax but will decrease the net average subsidy). But under the stability of migration($H_1>0$), the political investment of losers will lower the number of migrants, while that of gainers will augment it. Hence the average objective will provide less incentive for gainers to be involved in transfer politics while it provides more incentive for losers to increase their political investment, ceteris paribus. In sum,

Proposition 3 *If the average subsidy and the average tax are the objectives of the gainers and losers, the gainers will be less interested in transfer politics. The losers will be more inclined to invest in transfer politics than in the case when the total subsidy/tax is the objective.*

Note that the variable cost of adjustment of migrants is more binding for the interior solution of political investment of gainers than for that of losers, if per-capita transfer is the concern of the interest groups. Corresponding to(2A), assume

$$\text{(2B)}\quad R_2=\Psi_2(z_2, g),\ \frac{\partial R_2}{\partial g}>0$$

and (C2) holds. Then

$$\text{(R9)}\quad \frac{\partial Z_2}{\partial g}<0,\ \frac{\partial \tilde{Z}_2}{\partial g}<0$$

assuming the cross partial is negligible. Hence, expected economic growth will unilaterally decrease the level of political investment of both the losers and gainers in transfer politics. We propose

Proposition 4 *If the gainers(losers) are interested in the average rather than the total level of subsidy(tax), expected economic growth in the future will unilaterally decrease the optimal choice of political investment under the condition of an interior solution.*

The total deadweight cost[16] in this economy can be represented as

$$\text{(27)}\quad DC=\sum_{i=1}^{2}(R_i-\tilde{R}_i+m_i+\tilde{m}_i)$$

Hence

$$\text{(R10)}\quad \frac{\partial (DC)}{\partial c}=(F_2'-1)\frac{\partial h^*}{\partial c}\left[\frac{\partial I_2}{\partial M_2}+\frac{\partial \tilde{I}_2}{\partial \tilde{M}_2}-\frac{1}{N}\right]>0 \text{ as } F_2'>1,\quad \frac{\partial h^*}{\partial c}>0$$

by (26) and similarly

$$\text{(R11)}\quad \frac{\partial (DC)}{\partial b}=(F_2'-1)\frac{\partial h^*}{\partial b}\left[\frac{\partial I_2}{\partial M_2}+\frac{\partial \tilde{I}_2}{\partial \tilde{M}_2}-\frac{1}{N}\right]>0 \text{ as } F_2'>1,\ \frac{\partial h^*}{\partial b}>0$$

i.e. we propose

Proposition 5 *An increase in the adjustment cost will lead to more social waste occurring from rent seeking activities.*

16) Excluding the opportunity cost of political expenditures and the general equilibrium effect of distortions.

Note that in our model the optimal decision on m is assumed to be made by a benevolent dictator in each group. In her objective function the adjustment cost is not counted since it only occurs when the members of a suffering group actually migrate.

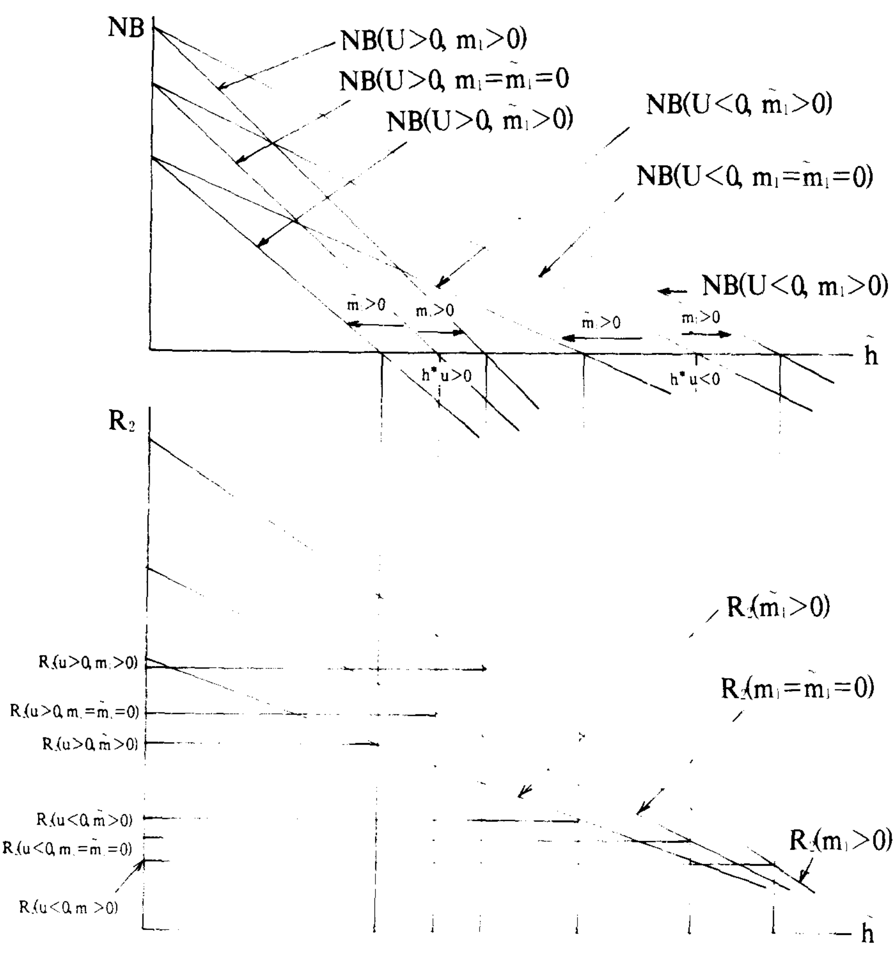
4. CONCLUDING REMARKS

In this paper, we have extended the influence competition model proposed by Becker and Cairns into a more realistic one incorporating the possibility of losers taking the exit option. Our analysis began with a key recognition that heterogeneity exists among the members of an interest group(in particular, losers);this plays a crucial role in determining the degree of mobility and the possible rents of interest groups, and hence in assessing the policy implications of political economy models. The heterogeneity of losers is expressed in terms of the adjustment cost of losers. Along with the heterogeneity of interest groups, a hypothetical central planner(or dictator) of each group is introduced for the maximization problem. A central planner in each group may be interested in the total levels of subsidy/tax or in their average levels.

The results of the analysis are as follows. First, for triggering migration, the constant cost should not be too large. However, for an interior solution of short run dynamic political investment of each group, the variable cost should not be too small, unless the population ratio of losers over gainers is larger than the square root of the ratio of total tax over subsidy after migration. Our second result relates to the effect of exogenous paramenters governing the transfer function(i.e. a mapping from the political influence of gainers to the transfer to gainers) on the optimal choice of political investment of interest groups. As an example, we adopted two variable ;an(expected) increase in the deadweight cost of transfer(lowering the transfer given political influence) and an (expected) increase in growth of the economy(augmenting the transfer given political influence). In a two group model(gainers vs. losers), we find that expected economic growth will provide less incentive for gainers to invest in transfer politics, while an expected increase in the deadweight cost of transfer will provide more incentives for them. This holds unless the population of gainers after migration(or the absolute risk aversion of gainers) is small enough. For losers, the effect of economic growth and an increase in the deadweight cost on optimal political investment is more subtle. Interestingly, however, we find that the condition is more restrictive for losers. Further, losers' response to an exogenous shock on the transfer function will indicate the response of gainers but not vice versa.

If the interest groups are interested in the average rather than the total, expected economic growth will unilaterally decrease the level of optimal political investment of gainers and losers under the condition of the interior solution. This discussion suggests that the objective of the center of the political organizations in transfer politics and the structure of the exit option possible to losers will be important in assessing the effect of the changes of exogenous parameters in the transfer function. Introducing the exit option to losers is an important extension of existing political economy models. By allowing losers to escape or join gainers, we get a much richer perspecitve. In particular, the population puzzle regarding the relationship between group size and influence raised by Becker and Cairns(and also others) may be largely explained by this extension.

Figure 1. Optimal Solution form : U>0 vs. U<0 (H>0)



$$\frac{\partial NB}{\partial h} = -H<0\,(H>0), \quad \left.\frac{\partial NB}{\partial h}\right|_{U>0} > \left.\frac{\partial NB}{\partial h}\right|_{U<0}$$

$$U>0:\ R_2(\tilde{h}\,; m_1>0)>R_2(\tilde{h}\,; m_1=\tilde{m}_1=0)=R_1(\tilde{h})>R_2(\tilde{h}\,; \tilde{m}_1>0)$$

$$U<0:\ R_2(\tilde{h}\,; \tilde{m}_1>0)>R_2(\tilde{h}\,; m_1=\tilde{m}_1=0)=R_1(\tilde{h})>R_2(\tilde{h}\,; m_1>0)$$

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