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ABSTRACT

Government Gains from Self-Restraint: A Bargaining Theory of Inefficient Redistribution Policies*

We consider a bargaining model of the interaction between a government and interest groups in which, unlike existing models, neither side is assumed to have all the bargaining power. The government will then find it optimal to constrain itself in the use of transfer policies to improve its bargaining position. In a model of redistribution to lobbies, the government will find it optimal to cap the size of lump-sum transfers it makes below the unconstrained equilibrium level. One implication is that with the optimal cap on efficient subsidies in place, less efficient subsidies will be used for redistribution even when they serve no economic function. We thus offer an alternative theory that explains why governments may optimally choose to restrict efficient lump-sum transfers to interest groups and partially replace them with relatively less efficient transfers.

JEL Classification: C70, D70, F13 and H23
Keywords: bargaining, caps, inefficient transfers, lobbies and special interests

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The government of José Manuel Durão Barroso is taking a hard line on labour negotiations and pushing through austerity measures that include tax increases and spending cuts. Ahead of public sector pay negotiations for 2003 later this month, it has been adamant that anything above a 3 per cent rise, equal to forecast inflation, would put the country's stability pact commitments at risk.

"Portugal Chafes Under the Yoke of Austerity" *Financial Times* Sep 25, 2002

1 Introduction

In the 1930's the U.S. federal government initiated an agricultural policy with the objective of providing income support to farmers. Currently, expenditure on farm price and income support is about $18 billion a year. Historically the transfers have been based on a variety of price distorting policies such as price supports, production subsidies and trade policies. In 1996 the Freedom to Farm Act introduced direct payments to farmers subject to annual caps stipulated for the 6 years until the legislation was due for revision. The 2002 Farm Security and Rural Investment Act tightened some of the payment limits in the 1996 Act and included a cap on individual programs. There is also a constraint on total expenditure under the program agreed to by the US in the context of the WTO.[1]

Welfare payments are often also subject to such limitations. Federal bloc grants to states for welfare payments are capped. For example TANF (Temporary Assistance for Needy Families) entitles States to fixed bloc grants and was implemented with a cap of $16.5 billion annually for 6 years. One of the reported reasons for the adoption of the caps was to control the cost of the transfers under the program that it replaces, the AFDC. Another example is the Social Services Block Grant Program that is also subject to a cap that has decreased gradually over time from $2,400 billion in 1982 to $1,700 in 2001.

No matter what the stated reason for such limits, there is another, often unstated, benefit to the government. This benefit is suggested by the opening quote on the constraining effect of the Stability and Growth Pact on members of the European Union. When the interaction between government and special interests is one of bargaining, restrictions on what the government is allowed to do may improve its bargaining position, and hence may actually be favored by the government. This is the

[1] "The 2002 Farm Act also requires the Secretary, 'to the maximum extent practicable, to adjust domestic commodity program expenditures to avoid exceeding allowable' WTO domestic support ceilings. The Uruguay Round Agreement on Agriculture put a maximum allowable level on trade-distorting domestic support programs, as measured by the aggregate measurement of support (AMS). The ceiling on the U.S. AMS fell from $23.1 billion in 1995 to $19.1 billion in 2000." Westcott, Young, and Price (2002), p. 10.

key point we will investigate in this paper, along with its implications for the type of instrument that is used for transfers. Restricting the use of an instrument does not mean that a special interest will be unable to achieve its objectives, but only that these objectives may be achieved in other, less efficient ways.[2]

1.1 Inefficient income redistribution

Transfers to effect redistribution provide a very good example of our points, one that is especially relevant due to the importance of redistribution as a function of government. Motivations for redistribution are easy to discern and understand. Redistribution can arise from concern over equity or more generally as the political economy outcome due to voting or lobbying. The methods used for redistribution are much less well understood. Specifically, why do governments often use inefficient policies to redistribute income towards different interest groups? For example, governments universally use trade policy to redistribute income towards particular factor owners. Many models explain which factor owners and sectors are more successful in this redistribution process, but not why it is carried out using tariffs, never a first-best instrument for redistribution, as opposed to a production subsidy or lump-sum payment.[3] Other examples of inefficient but widely used means of redistribution include some types of agricultural price supports (which serve primarily to increase the income of farmers), and barriers to entry and other policies protecting monopolies, which often serve primarily to increase the income of those factor owners whose monopoly position is protected.

Several arguments have been presented to explain why politicians use inefficient rather than efficient means of redistributing income to special interest groups.[4] Perhaps the most prominent argument is that inefficient transfers are used because their redistributive purpose can more easily be disguised. When transfers are the result of a program that is not ostensibly aimed at redistribution, those who bear the costs may be largely ignorant of the redistribution taking place and are thus less likely to oppose it. Tullock (1983) termed such programs "disguised" transfers, the key characteristic

[2] This suggests that if we constrain the government simply to decide whether or not the efficient transfer can be used when inefficient transfers are available, it could decide not to use the efficient transfer at all. The absence of lump-sum (*i.e.*, efficient) transfers in practice suggests that the government faces this type of binary choice. In this case, we would observe no examples of caps on efficient transfers to support our modeling mechanism of caps. This may be why we can only find indirect evidence for the use of caps that are potentially motivated by a politician's desire to improve its bargaining position.

[3] In reviewing the literature on the political economy of trade policy Rodrik (1995) states: "Of course trade policy is not the only, or even the most important, mechanism of redistribution used by governments. But practically all governments apparently use it for that purpose. A sufficiently general and convincing explanation for this phenomenon has yet to be formulated" (p.1476).

[4] All of these political arguments may be seen as giving more structure to Becker's (1983) "influence function" approach to the power of interest groups. Becker suggests that the influence of special interest groups may depend on the method by which transfers are made.

being that these programs have an ostensible social welfare benefit as well, at least in some states of nature.

Coate and Morris (1995) formalize the argument of disguised transfers as follows. Transfers to special interests can take the form of cash (that is, lump-sum, efficient transfers) or building public projects, where a project benefits the special interests and may benefit the population as a whole. There are two types of uncertainty. The first is about the incumbent politician, whether he cares only about social welfare (and staying in office) or about special interests as well. The second is about whether a project is expected to yield net positive social value. Transfers to special interests in cash reveal the politician as the type who caters to special interests, this type of politician can take advantage of the uncertainty about whether a project is worthwhile *ex ante* to make transfers to special interests via building projects. In a political equilibrium, there may be inefficient overprovision of public projects, arising from their relative lack of transparency as a form of redistribution. Asymmetric information about the value of the project and the aims of politicians is crucial for this theory to explain the use of inefficient transfers. In contrast, information asymmetries play no role in the mechanism we focus on to explain the use of inefficient transfers.

A second argument for inefficient transfers has been suggested by Acemoglu and Robinson (2001). Political institutions cannot credibly commit to future policies, which will be determined by whomever has political power at the time the policy is actually determined. They assume that larger groups have more political power, so that policy at any date will favor larger groups. Inefficient transfers may be especially effective in maintaining or increasing group size. For example, agricultural subsidies will keep farmers from moving into other sectors. Difficulties of committing to future policy may also help explain the use of inefficient forms of transfer if one believes that they are harder to reverse than efficient forms of transfer. In contrast, in our approach group size is assumed unchanged over time, with no effect of one type of policy versus another on group size. Hence, key considerations in the Acemoglu-Robinson explanation play no role in our mechanism.

A third argument is that specific types of transfers give political benefits that lump-sum transfers do not. Shepsle and Weingast (1981) and Weingast, Shepsle, and Johnsen (1981) argue that geographically concentrated projects may be oversupplied if they give political in addition to economic benefits. Dixit and Londregan (1995) consider a world where transfers are decided solely on political grounds, so that the structure of transfers will depend on the distribution of political characteristics across the population. These political characteristics may be distributed quite differently from the

economic characteristics that an efficient government program would reward.[5] Though this is an important point, in our approach differences in "political" characteristics across interest groups plays no role.

A fourth argument is that politicians who want to reduce the amount of redistribution to special interests can do so by committing to using less efficient forms of transfers. This argument has been presented by Rodrik (1986), Wilson (1990), and Becker and Mulligan (1998).[6] For example, Becker and Mulligan consider competition over transfers between two interest groups that partially internalize the deadweight cost of taxation to provide these transfers. A less efficient tax system increases these deadweight costs and hence leads to lower total transfers in equilibrium. In our mechanism the government's desire to limit the amount transferred to interest groups is similarly central to the type of transfers used, though the behavior of government and interest groups is derived from explicit utility maximization. Basing the behavior and hence the interaction of the parties to bargaining on utility maximization allows us to sharpen a number of predictions of this type of model. Moreover, we focus on a model where there are many special interest groups so that their behavior and our results do not rely on special group competition.

Formally the closest work to ours has been presented by Grossman and Helpman (1994), and Dixit, Grossman and Helpman (1997), who pioneered models of bargaining between government and interest groups based on utility maximization. Our set-up parallels theirs, but with some crucial differences. Foremost among them is our assumption that neither side has all the bargaining power, in contrast to their "menu-auction" approach in which the interest groups make take-it-or-leave-it offers to the government. We will show that this difference is crucial in a number of respects. For example, in their papers, competition among special interests to receive government transfers implies that more distortionary instruments may improve the bargaining position of the lobby. As our single interest group example makes clear, competition among lobbies is not the driving force of our mechanism. We compare our results to theirs in more detail below.

Finally, we stress that in our theory the government's gain from self-restraint will not be due to time-inconsistency. In fact there is no time inconsistency problem in our framework, so that this is *not* the argument we are making.

[5] A related line of explanation focusses on the institutional details of the legislative process by which transfers are chosen, as in the work of Fiorina (1981) and Baron (1991). See Drazen (2000) for further details.

[6] A related argument is presented by Bruce and Waldman (1991). If recipients can take actions that increase the size of transfer a donor will find optimal to give, tied transfers may lessen this moral hazard problem.

1.2 A bargaining theory of inefficient redistribution

In this paper we offer an alternative theory that explains why governments may optimally choose to restrict efficient lump-sum transfers to interest groups and partially replace them with relatively less efficient transfers. We consider a world in which the government values both social welfare and a good provided by the interest group. The government in turn makes transfers to interest groups, where the size of the interest group contribution and the government transfer are determined by bargaining. Our basic argument may then be understood in two parts. We first show that if transfers are lump-sum and neither party has all the bargaining power, it will be optimal from the government's perspective to put a binding cap on the lump-sum subsidy it can offer. The reason is that this improves the bargaining position of the government by limiting the maximum utility the interest group can obtain by bargaining with the government. The second part of the argument is then to show that with the optimal cap on efficient subsidies in place, less efficient subsidies will be used for redistribution even when they serve no economic function. To put the argument another way, if these inefficient subsidies were replaced by efficient ones, the government would be in a worse bargaining position and ultimately be worse off. Hence, the optimal cap on efficient transfers and the use of inefficient ones. It need not be that the relatively efficient transfer is purely lump-sum, but only that a limitation or cap on its use leads to a less efficient transfer being used in its place.

Our argument depends crucially on subsidies in one direction and contributions in the other being determined by bargaining, where neither government nor interest groups have all the bargaining power. We think it is important to investigate the implications of this type of interaction, since it may capture an essential characteristic of how policy towards special interests is actually made. To the extent that what may emerge is a government imposing restrictions on itself and use of inefficient means of redistribution, interaction via bargaining may provide an important explanation of important phenomena. We model the outcome of the "give-and-take" between an incumbent politician and an interest group as the solution to a Nash bargaining problem, with possibly asymmetric bargaining power. Following Binmore, Rubinstein, and Wolinsky (1986), we view this solution as representing an alternating offer game with some probability of exogenous breakdown.

To better understand how our result arises, consider first the interaction between the government and the interest group when there is only an efficient instrument of redistribution, T. In exchange for contributions C, the government offers the interest group a lump-sum subsidy. When transfers are lump-sum and enter additively into both the government's and the lobbies' objective functions, there will be a unique level of the subsidy that is consistent with the optimality conditions, with the level

of the transfer being determined by how the gains from bargaining are split between the government and the lobbies. If the government does not have all the bargaining power, it will find it optimal to put a binding cap on the lump-sum transfer given to lobbies, since this limits the maximum utility a lobby can obtain from dealing with the government. However, if the cap is not too low it does not limit the maximum amount that the government can gain from accepting contributions. Therefore a binding cap can effectively commit the government to making an offer to the lobby with a lower level of transfer relative to a given contribution, as compared to the unconstrained situation. This result holds under fairly general circumstances, and it is the key mechanism driving our results.

Suppose now that in addition to the lump-sum subsidy T, there exists an alternative policy, t, that is relatively less efficient. The government will still choose to put a cap on T, but in this equilibrium the less efficient transfer t will still be used as long as the marginal inefficiency of t *at* $t = 0$ is sufficiently small. This will be true even if any *positive* level of t is less efficient than T. Why doesn't the government increase the cap on the efficient subsidy and replace t with the more efficient subsidy? Because doing so worsens the government's bargaining position and thus its utility by changing its ability to bargain effectively with the lobby and commit to a lower transfer.[7]

If the inefficient transfer served no economic function, the government would find it optimal to cap its use at zero, that is, prohibit its use, since inefficient transfers simply erode the gain in bargaining power the government achieved by capping the efficient policy. An inefficient policy undermines the government gain from capping T since it acts as a partial substitute for the efficient one. Not capping *all* inefficient transfers at zero may reflect the government's inability to do so, which seems reasonable given the multitude of ways that transfers can be made. Alternatively, as in our example with production subsidies, the inefficient transfer may have a positive social value in some states of nature so that it is not optimal to prohibit its use.

The paper is organized as follows. In the next section, we describe the economic setup and political economy interaction and how it maps to the Nash bargaining solution. Section three contains the basic results regarding the governments' decision to cap the use of the efficient redistributive policy. In section four we add an inefficient transfer in the form of a production subsidy and show how it will be used alongside the efficient transfer as a means of transferring income to special interests in

[7] Coate and Morris (1996) in studying policy conditionality imposed, for example, by the World Bank, argue that if the Bank restricts one type of relatively efficient transfer to an interest group, it may simply be replaced by a less efficient transfer in equilibrium. Hence, conditionality would lower welfare. Though the substitution result is the same as in both their model and ours, and is key to the overall conclusion, the basic point of the papers is quite different. In our model, the government finds it optimal to constrain itself to raise its welfare (and, as we shall show, social welfare as well). Their point is that an exogenously imposed constraint, which the government would not put on voluntarily, may lower social welfare even though it was intended to raise it.

a state of nature in which it has no social value. In the final section we summarize our results. The appendices contain a formal description of the equilibrium with inefficient transfers, as well as an extension to an alternative form of bargaining.

2 The Model

2.1 Economic structure

We consider a small open in which individuals are similar except for their different endowments of non-labor factors. To motivate the possible use of non-lump-sum transfers we assume that in some states of nature a production externality is present, which may be addressed by a production subsidy. Indexing the state, in which the production externality is presentin sector i by $\rho_i = 1$, and the other by $\rho_i = 0$, we represent utility in state ρ as:

$$u_\rho \equiv x_n + \sum u_i(x_i) + \sum\nolimits_{i\in\varrho} \rho_i \phi(\pi'_{i\rho}) \text{ for } \rho_i = 0, 1 \tag{1}$$

where π represents profit and thus π' is the equilibrium quantity produced. We assume $\phi' > 0$ and $\phi'' < 0$. The subutility functions, u_i, are twice continuously differentiable and strictly concave. The term x_n, represents the consumption of the numeraire good, n, which is produced using labor with a marginal product of unity. This along with the assumption of a fixed world price of n at unity and a sufficiently large labor force fixes the wage at unity. The exogenous world price for other goods is p_i. For given prices an individual who owns the specific factor i has income E_i and chooses consumption to maximize utility subject to a budget constraint, $x_n + \sum_i p_i x_i \leq E_i$. Given the assumptions on the subutility, the budget constraint is satisfied with equality and individuals demand $d(p_i) = u'(p_i)^{-1}$ of each of the non-numeraire goods.

The indirect utility for an individual in state ρ is:

$$V_\rho(\mathbf{p}, E_i) = E_i + s(\mathbf{p}) + \sum\nolimits_{i\in\varrho} \rho_i \phi(\pi'_{i\rho}) \tag{2}$$

where the term $s(\mathbf{p})$ represents consumer surplus, i.e. $s = \sum u(d(p_i)) - p_i d(p_i)$ and ϱ denotes the set of sectors that produce the externality in the good state.

The non-numeraire goods require labor and a specific factor to be combined according to a constant returns technology. Since the wage is unity the return to the specific factor depends only on the supplier price of the good, p_i^s. The reward is given by the quasi-rent $\pi_i(p_i^s)$ and equilibrium

output is $\pi_i'(p_i^s)$. In the absence of production taxes, tariffs or international trading costs we have $p_i^s = p_i$.

Given the production externality a welfare-maximizing government would use a unit production subsidy, t_i, to subsidize production for all $i \in \varrho$ when $\rho_i = 1$.[8] The government may also use a lump-sum transfer, T. Any potential transfers to interest groups or production subsidies are financed by lump-sum taxes charged on the voting population of N individuals, and we allow for a unit collection cost of $\beta \in (0, 1)$, which is identical for all types of transfers to the lobbies. Hence, the cost of raising one unit of revenue is identical independently of whether it is spent as a production subsidy or lump-sum transfer. We assume that the government balances its budget every period, so that a total transfer of τ requires the government to collect $\tau/(1-\beta)N$ from each of the N individual tax payers. Total transfers are given by:

$$\tau_\rho = \sum\nolimits_i T_{i\rho} + \sum\nolimits_i t_{i\rho}\pi'_{i\rho} \tag{3}$$

An exogenously given set of sectors L form lobbies and their gross welfare is:

$$W_{i\rho} = l_i + \pi(p_i + t_{i\rho}) + \alpha_i N[s - \tau_\rho/(1-\beta)N + \sum\nolimits_{i\in\varrho} \rho_i \phi(\pi'_{i\rho})] \tag{4}$$

where α_i is the share of the voting population that owns factor i and l_i is their labor income.

The lobby offers a contribution C_i in exchange for an increase in a transfer to itself, which can take the form of a lump-sum transfer or a unit subsidy. We assume that factor ownership in any one particular lobby is sufficiently concentrated, i.e. α_i is sufficiently small, such that it takes the size of the budget, $\tau/(1-\beta)$, as given and does not lobby for it to be reduced. We do so to maintain our theory focused on the interaction between the government and the lobbies in the absence of any lobby competition effects. Thus the lobby maximizes its gross welfare net of contributions plus the value of the transfer. The welfare for an organized lobby net of contributions is

$$V_{i\rho} \equiv W_{i\rho} - C_{i\rho} + T_{i\rho} \tag{5}$$

Social welfare is obtained by summing the indirect utility over all individuals both in and out of

[8] Note that consumer prices are independent of the state of nature because this is a small open economy so any production subsidies will have an effect only on quantities produced. The higher tax levied to pay for the extra subsidy will lower individuals' income but this will only result in lower consumption of the numeraire good.

lobbies[9]:

$$W_\rho \equiv l + \sum_i \pi(p_i + t_{i\rho}) + Ns - \tau_\rho/(1-\beta) + \sum_i T_{i\rho} + N \sum_{i \in \varrho} \rho_i \phi(\pi'_{i\rho}) \tag{6}$$

The government objective is a weighted sum of social welfare and lobby provided goods.

$$G_\rho \equiv aW_\rho + \sum_{i \in L} \Psi_i(C_{i\rho}) \tag{7}$$

where we assume that $\Psi'_i > 0$ and $\Psi''_i < 0$, $\lim_{C_i \to 0} \Psi'(C_i) = \infty$ and $\Psi(0) = 0$.

2.2 Political interaction structure

The structure and timing of the interaction between the government and lobbies is as follows. In an initial stage the government chooses a cap on the amount of the transfers it can make. In the second stage the government and the lobbies bargain over a level of the contributions and transfers. We model the outcome of this interaction as the solution to a Nash bargaining problem. We can interpret this as a bilateral game of alternating offers between the government and each of the lobbies separately, given the additive separability of contributions and subsidies in the governments' objective and the concentrated factor ownership for organized groups. Since this separability allows us to discuss the results in the context of a single interest group we drop the subscript i.

The equilibrium of a game of alternating offers can be represented as the solution to the Nash bargaining if there is an exogenous, constant risk of breakdown of negotiations in each round (Binmore, Rubinstein, and Wolinsky [1986]). We do not specify the institutional structure which might imply a game of alternating offers, but we would argue that the "give-and-take" that such a game is meant to represent is a key feature of the interaction of politicians and lobbyists. An exogenous risk of breakdown can be justified by noting first that the transfers and contributions between politicians and interest groups are widely considered not to be in the social interest. Hence, as discussed in the introduction, both the transfers and the process by which they are worked out are often hidden, and exposure of the process to the cold light of day might well bring it to an abrupt halt.

A key feature of the bargaining process is that neither side has all the bargaining power, that is, neither side can make a "take-it-or-leave-it" offer. This is in contrast to the menu-auction approach of Grossman and Helpman (1994) and Dixit, Grossman, and Helpman (1997), in which interest groups present the government with a "menu" of contributions in exchange for different levels of the

[9] Note that we include the value of transfers to the organized factor owners to properly reflect the fact that if the government raises and transfers a certain amount in a lump-sum form using T the only cost in terms of social welfare is the revenue lost in collection. That is the social marginal cost of T is $1 - 1/(1-\beta)$.

policy instrument (transfers in our model), which the government can only accept or reject, with the latter implying a reversion to the status quo. At the other extreme, is the veto player model of Drazen (2002) that assumes the government chooses the policy vector, which interest groups can either accept or reject. Our assumption that neither side has all the bargaining power is necessary for the key results and highlights the importance of considering alternatives to the extremes represented by the government or lobby as veto players.

3 Efficient Transfers

We begin with the case in which there are no production externalities and restrict the transfer policy space to include only lump-sum transfers. We first show that when the only possible transfer available is the most efficient one, the government optimally chooses to cap it below the unconstrained solution.

3.1 Equilibrium without caps

Figure 1 illustrates the unconstrained solution. The vertical axis denotes contributions to the politician, the horizontal axis transfers to the lobby. The line V^0 represents the lobbies' reservation utility, i.e. when it makes a zero contribution and receives no transfer. From (4) and (5), the lobby is indifferent between a contribution and an efficient transfer of the same amount so the slope of V is unity since we are assuming that $\alpha \longrightarrow 0$. Any movements towards the southeast leave the lobby better off. The government's reservation utility is denoted by G^0. It is upward sloping because the negative effect of a transfer paid to the lobby must be compensated by an increase in the contribution received. Movements to the northwest improve the government's welfare. If the marginal rate of substitution of contributions for transfers is lower for the government then the lobby at the origin then lobbying will be "politically efficient". This is satisfied given our assumption on Ψ.[10]

The segment $g^m v^m$ in Figure 1 that defines the contract curve is horizontal because G and V are quasilinear in T. Therefore, provided the transfer is in the range $[T^0, T^1]$, that is provided that the the lobby and government respectively are assured their reservation utilities, the unconstrained contribution level, C^N, is simply determined by the following efficiency condition

$$\begin{aligned} \frac{G_T}{G_C} &= \frac{V_T}{V_C} \\ \Psi'(C^N) &= \frac{a\beta}{1-\beta} \end{aligned} \tag{8}$$

[10] The precise condition is $a\beta/(1-\beta)\Psi'(0) < 1$.

where G_T, etc. are partial derivatives. Thus, as expected, the equilibrium level of contributions decreases if the weight that the politician places on social welfare increases or the cost of collecting taxes increases.

To determine the equilibrium level of the lump-sum transfer we must consider the division of the surplus that arises from the Nash bargaining solution.

$$\begin{aligned} &Max_{G\geq g^0, V\geq v^0}\ U = (G-g^0)^{\gamma}(V-v^0)^{1-\gamma} \\ &\text{s.t. } G = g^m - \frac{a\beta}{1-\beta}(V-v^0) \end{aligned} \tag{9}$$

The solution is illustrated in Figure 2. Given that the Pareto frontier is linear the solution can be written as

$$g^N - g^0 = \gamma(g^m - g^0) \tag{10}$$

$$v^N - v^0 = (1-\gamma)(v^m - v^0) \tag{11}$$

Of the total surplus that is potentially available to the government over its reservation utility, it receives a share proportional to its bargaining power, γ. Similarly for the lobby. It is then simple to solve for the bargained level of the efficient transfer, T^N.

3.2 Optimal caps on efficient transfers

We now allow the government to cap the efficient transfer. No alternative transfer policies are yet available, an assumption which we relax in the next section. The timing of actions is the following. In the first stage the government chooses the cap T^c to maximize its objective function, $G(C^{Nc}(T^c), T^{Nc})$. In the second stage the government and lobby bargain over the contribution C^{Nc} and the level of the transfer $T^{Nc} \leq T^c$, taking the cap as given. Our objective is to show that the subgame perfect equilibrium level of the cap T^c strictly binds, i.e. that the government is *strictly* better off by setting a cap below the unconstrained transfer previously derived.

Solving backwards suppose that the cap is given by T^c in Figure 3. The contract curve is now defined by the kinked segment $g^{mc}v^{mc}$. Note that if the cap is greater than or equal to T^0, the transfer consistent with government utility level g^m, then the government can still assure the lobby its reservation utility, v^0, and therefore the government's maximum utility is unchanged relative to the unconstrained solution. For the cap to be binding it must be strictly less than T^1, the transfer consistent with lobby utility v^m as shown in Figure 1. This implies that to maintain the government

at G^0 the lobby can no longer achieve v^m.

At the point where the cap binds, the lobby can only be made better off by reducing its contribution to the government. Relative to the unconstrained solution it is feasible to find solutions such as N^c, which leave the government better off then N. We now show that such a binding cap is not only feasible but is the optimal cap chosen by the government in the first stage of this game.

Proposition 1 ***:***

In the absence of alternative transfer policies to lobbies the government chooses a cap on the efficient transfer that is strictly binding at (C^N, T^N) *iff neither player has all the bargaining power.*

Proof:

Sufficiency:

Suppose that $\gamma \in (0,1)$. We need only show the existence of a cap such that $T^c < T^N$ and $G(C^{Nc}, T^{Nc}) > G(C^N, T^N)$. The solution is illustrated in Figure 4. We first show that the constrained Pareto frontier is strictly concave. On the basis of that, we then show that $g^{Nc} > g^N$.

The constrained Pareto frontier in Figure 4 coincides with the original one for $T \leq T^c$ and thus its slope is simply $\frac{G_T}{V_T}$ up to point (C^N, T^c). From (8) we have $\frac{G_T}{G_C} = \frac{V_T}{V_C}$ at (C^N, T^c) so that $\frac{G_T}{V_T} = \frac{G_C}{V_C}$. The rest of the constrained frontier is strictly interior to the unconstrained frontier and has a slope of $\frac{G_C}{V_C}$, reflecting the ratio of changes in welfare as contributions change. Moreover, $\frac{G_C(C^N)}{V_C} = -\Psi'(C^N) > -\Psi'(C < C^N) = \frac{G_C(C<C^N)}{V_C}$, from the definitions of G and V as well as $\Psi'' < 0$, so the constrained frontier is strictly concave. Now define point A in Figure 4 as the intersection of the constrained frontier and $G = g^N$. Since the constrained frontier is strictly concave and $g^{mc} = g^m$ for $T^c \geq T^0$ (see Figure 3), the segment connecting g^m and A is everywhere below the constrained Pareto frontier.

Consider then an auxiliary problem where the Pareto frontier is defined by the straight line through g^m and A, which has some slope m. For *any* linear Pareto frontier the government equilibrium utility is $g^N - g^0 = \gamma(g^m - g^0)$ (from (10)). Since the straight line through g^m and A is a rotation of the original Pareto frontier inwards around g^m, and since $g^m - g^0$ and γ are unchanged in the auxiliary problem, the equilibrium government utility is also unchanged. Therefore the first-order condition for this auxiliary problem in 9 implies $-\frac{U_V}{U_G}|_A = m$ Strict concavity of the constrained frontier implies that at A, $m > \frac{G_C}{V_C}|_A$, the slope of the constrained frontier at A. Therefore, the equilibrium point N^C lies to the northwest of A, implying $g^{Nc} > g^N$.

Necessity.

If $\gamma = 1$ then the unconstrained solution is $g^m \equiv Max_{C,T}G$ s.t. $V = V^0$. The equilibrium transfer is $T^N(\gamma = 1) = T^0$. A strictly binding cap entails that the government's utility is now $g^{mc} \equiv Max_{C,T}G$ s.t. $V = V^0$ and $T^c < T^0$, the extra constraint implies that $g^{mc} < g^m$.

If $\gamma = 0$ then the second stage Nash bargaining solution is $G^{Nc}(T^{Nc}, C^{Nc}) = G^0(0, 0)$. The government is therefore indifferent among all values of T^c, which implies that there exist $T^c \geq T^N$ (that is, caps that are not strictly binding) that are subgame perfect equilibria. □

To understand the basic intuition for this result, we return to the interpretation of the Nash bargaining solution as representing the equilibrium of an alternating offers game. The cap limits the maximum utility a lobby can obtain from dealing with the government. Moreover, by setting a cap that binds at the unconstrained Nash solution the government credibly commits to transferring less than T^N in exchange for C^N. It is this commitment to a lower transfer that explains why the cap improves the government's bargaining position.

The proposition also illustrates the importance of allowing for a more general distribution of bargaining power between the government and the lobby. There is no strict gain for the government from setting a cap if it has neither all nor none of the bargaining power. Thus political economy approaches that focus on take-it-or -leave-it offers by the government or by the lobby completely miss the insight in this proposition.

4 Inefficient Transfers

We now increase the policy space to allow for transfers that are not lump-sum. We show that the government continues to set a cap on the efficient transfer and, more importantly, that the equilibrium will feature redistribution that makes use of the relatively inefficient transfer policy alongside a binding cap on the efficient policy.

4.1 Production subsidies

An inefficient transfer is typically in the form of a unit production or export subsidy, a price support, etc. Inefficient transfers are thus not lump-sum, but are instead conditional on the outcome of a particular economic variable and therefore affect economic decisions. Take the case of a production subsidy. Even in the absence of lobbying, a welfare maximizing government may want to use the

production subsidy as a way to correct a production externality. If that externality is time-varying, it will not be optimal to permanently cap the subsidy at a maximum rate below what is necessary to fully correct the production distortion in certain states of nature. Lump-sum transfers on the other hand are not used to address any meaningful economic distortion since, by definition, they are not conditional on any economic variables. Thus the government may optimally want to commit to set a cap on the lump-sum transfers but not on distortionary transfers. In doing so it leaves itself open to credible lobby offers of contributions in exchange for further transfers using the distortionary policies, which are also less efficient transfer policies. Importantly, the inefficient transfer policy will be used even in states when that externality is *not* present.

Allowing transfers to be made by less efficient means dilutes the gain the government obtains when it caps lump-sum transfers. Therefore, if the inefficient policy had no economic function, the government would find it optimal to cap it at zero. Of course in practice it may not be possible for the government to commit to a cap of zero on every single policy it could conceivably enact that affects a lobby positively. There may be several reasons for this, here we focus on a specific one. In order to motivate the optimality of not capping the inefficient transfer at zero, we consider the case of a production subsidy, which the government wants to be available in those states in which a production externality is present. Hence, we return to the case of two states, with and without the production externality.

We assume that the government is unable to set a cap which varies across states and is constrained to set a non-state-contingent cap if it sets one at all. There are several rationales for this assumption. First, in reality the government will be unable *ex ante* to fully specify all states of nature, so that an assumption of fully state-contingent caps is simply unrealistic. Moreover, it may be too costly to do anything other than set caps *ex ante*. Hence, it seems reasonable to assume non-state-contingent caps if it is costly to change the cap, for example, if it is written in law, and there are many possible states. The assumption may also capture the fact that countries may be constrained because of previous international agreements that can only be broken at a cost.[11]

We further allow the organized sector to bargain with the government over transfers only in the normal state ($\rho = 0$) where no externality is present. In the "good" state ($\rho = 1$), the subsidy is set at the socially optimal level and there is no trade of contributions for transfers. The key reasons for this are to make the driving force for our results as clear as possible and to distinguish them

[11] For example if the country has signed up to the WTO's code on subsidies it may have trouble in justifying very large increases in certain types of subsidies, even if it appeals to some externality. This is particularly relevant if there are many states of nature and/or they are not verifiable by foreign countries.

from the standard results on disguised transfers, as for example in Tullock (1983) or Coate and Morris (1995). That is, it is well known that when a policy has a social value it may be used in a world of asymmetric information to make transfers to special interests in place of a more efficient transfer instrument. As argued in the introduction, the social benefit of the policy allows the transfer component to be "disguised", so that this type of a transfer may arouse less opposition than a more transparent one. Since our bargaining channel leading to the use of inefficient transfers in a political equilibrium is fundamentally different, we eliminate the possibility of disguised transfers by the stark assumption that there is no bargaining over transfers in the state where an externality is present, while inefficient transfers are used in a state in which it is *known* by all that they serve no social purpose. A further argument for ruling out lobbying in the state when the externality is present is that the "inefficient" transfer t can actually be an efficient transfer policy relative to T, in the sense we define below. Hence, limiting bargaining over transfers to the state where there is no externality, so that t is an unambiguously inefficient transfer policy relative to T in a well-defined sense will serve to sharpen our key result. With this objective we only allow the organized sectors to bargain with the government in the state when no externality is present.

4.2 A formal definition of inefficiency

Before considering the nature of the equilibrium, we provide the following definition and lemma about an inefficient transfer policy.

Definition: *Policy t is an inefficient transfer policy relative to T iff there are no joint political gains from trade between the government and lobby by lowering T and increasing t above the social welfare maximizing level of t. That is $\{T^*_\rho, t^{ext}_\rho\} \equiv argmax_{T,t}(G_\rho((\bar{C},.)+V_\rho(\bar{C},.))$ and t^{ext}_ρ* is defined by $G_{\rho t}(t^{ext}_\rho,.) = 0$.

The social welfare maximizing value for t is zero in the absence of externalities. This definition then requires that, for $t \geq 0$, no joint gains are possible from using t as a transfer to partially replace T, the lump-sum transfer. This is a reasonable definition of inefficiency and one we want to hold in order to clearly show how the bargaining mechanism is driving the result. (Graphically this definition can be represented in a two–dimensional figure in $T-t$ space where the lobby indifference curve cannot lie below a government indifference curve if both go through the same T at $t = 0$, as in Figure 5.)

As shown in the following lemma this definition holds true only for the state in which no production externality is present. Intuitively the definition does not hold when $\rho = 1$ because the marginal social

cost of increasing t around the social optimum is close to zero but the marginal benefit to the lobby is strictly positive if this lobby produces an externality and is therefore already receiving the subsidy.

Lemma 1: *t is inefficient relative to T iff $\rho = 0$.*

Proof:

Sufficiency: Consider the case when $\rho = 0$. We obtain $t_0 = 0$ from

$$t_0^{ext} : G_{0t} \equiv -a[\beta\pi_0'(p + \hat{t}_0) + t_{i0}\pi''(p + t_0)]/(1 - \beta) = 0 \tag{12}$$

Deriving a contract curve in $T - t$ space for any given contribution level the definition requires that such a curve contain no points such that $t > 0$. For this to true, it must be the case that $t > 0$ implies no gains from bargaining. This requires:

$$-\frac{G_t}{G_T}|_{dG=0} < -\frac{V_t}{V_T}|_{dV=0} \tag{13}$$

$$[\pi_0'(p + \hat{t}_0)\beta + t_0\pi''(p + t_0)]/\beta > \pi_0'(p + \hat{t}_0) \tag{14}$$

$$t_0\pi''(p + t_0) > 0 \tag{15}$$

This is always satisfied given the convexity of the profit function. Note that these equations imply that at $t_0 = 0$ we have $G_t/G_T = V_t/V_T$.

Necessity: Consider the case when $\rho = 1$. The optimal level of subsidy to address the externality is given by:

$$t_1^{ext} : G_{1t} = 0$$

For $t \geq t^{ext}$ to be inefficient, it must be the case that when $t \geq t^{ext}$,we have:

$$[-\frac{G_{1t}}{G_T} \leq -\frac{V_t}{V_T}]_{t \geq t^{ext}} \tag{16}$$

$$[\frac{G_{1t}}{a\beta/(1 - \beta)} \leq -\pi_{i1}'(p + \hat{t}_1)]_{t \geq t^{ext}} \tag{17}$$

But since $G_{1t}(t = t^{ext}) = 0$ by the definition of t^{ext} and $\pi_1'(p + t = t^{ext}) > 0$, condition (17) cannot hold. Hence, t is *not* inefficient in state $\rho = 1$.□

4.3 Equilibrium with inefficient transfers

The timing of the two-stage game is as follows. Before ρ is observed the government chooses caps for the transfers in order to maximize the expected value of its objective over the states. That is it commits to a maximum level of the lump-sum transfer, T^c, and subsidy rate, t^c. As argued above, this choice is not state contingent. Once the caps are chosen the state is revealed. If $\rho = 0$ the government and lobby bargain over the level of contributions and transfers. If $\rho = 1$ the government simply chooses the level of transfers and subsidies to maximize its objective.[12] For simplicity of exposition, we assume that all sectors are organized into lobbies.[13]

We now analyze the equilibrium. Recall that given the additive separability of the government and lobby objectives in each sectorial variable and the fact that $\alpha_i \longrightarrow 0$ we can analyze the problem for each sector independently and hence drop the subscript i. We begin with the second stage. When $\rho = 1$, the choice of T, t and C in the second stage is straightforward. The value for C chosen by the lobby and T chosen by the government are necessarily zero, since we do not allow bargaining for transfers when externalities are present. When the cap on t is binding, then $\hat{t}_1 = t^c$. The value for t_1 if the cap does not bind is given by:

$$\hat{t}_1 : G_{1t}(\hat{t}_1, .) = 0 \tag{18}$$

$$G_{1t} \equiv -a[\beta\pi_1'(p^c + \hat{t}_1) + t_1\pi''(p^c + \hat{t}_1)]/(1-\beta) + N\pi''(p + \hat{t}_1)\phi'(\pi_1'(p + \hat{t}_1)) \tag{19}$$

The first set of terms defining G_{1t} represent the social marginal cost of increasing the subsidy in terms of the cost of raising the revenue and the production distortion caused. The second term represents the social marginal benefit arising from the externality due to the extra production.

Consider now the equilibrium in the second stage when $\rho = 0$. We represent the solution for this state in Figure 6 and formally derive the key properties of the equilibrium in the proposition below. The dashed line in Figure 6 represents the Pareto frontier when $\rho = 0$ if there were no caps set on T. In this case the frontier is identical to the one derived in Figure 4. If the government sets a cap on T alone then Figure 6 is identical to Figure 4 up to the cap level, T^c because, as we show in lemma 1, T is more efficient than t and thus it will be the policy used until the cap binds. Any further transfers by the government to the lobby must then occur in the form of the production subsidy provided that

[12] In the appendix we present a formal definition of the equilibrium.

[13] In an unorganized sector, no transfer would be made in the normal (no externality) state, while the transfer when the externality is present would be at the socially optimal level. Thus a binding cap on transfers to an unorganized sector would have no role.

the optimal cap for t is strictly positive, which we show in lemma 2 below to be the case. The Pareto frontier when a cap is set on T and the production subsidy is used is concave for small values of t.[14] This implies that the government gains from setting a cap on T as shown in proposition 1. In proposition 2 we show the concavity formally but intuitively it is due to the following. First, because the subsidy is inefficient relative to the lump-sum transfer the Pareto frontier when t is used lies below the dashed line. Second, this inefficiency disappears when $t_0 = 0$ and thus the slopes of the Pareto frontier when there is no cap on T and the new frontier are identical at $t_0 = 0$, as shown in lemma 1. We now show the preceding points formally.

4.3.1 Optimal caps

Consider now the first stage. The optimal cap on the production subsidy is chosen to maximize the government's expected welfare. If p is the probability of the state with the externality occurring, then the optimal cap is given by:

$$t^c : p\frac{dG_0}{dt^c} + (1-p)\frac{dG_1}{dt^c} = 0 \tag{20}$$

where $dG_0/dt^c \equiv G_{0C}C_{0\tilde{t}^c} + G_{0T}T_{0\tilde{t}^c} + G_{0t}t_{0\tilde{t}^c}$ and similarly $dG_1/dt^c \equiv G_{1C}C_{1\tilde{t}^c} + G_{1T}T_{1\tilde{t}^c} + G_{1t}t_{1\tilde{t}^c}$.[15] In state $\rho = 1$, both T and C are zero by assumption, regardless of any cap set on t^c, so the second term simplifies to $(1-p)G_{1t}t_{1\tilde{t}^c}$. The socially optimal level of the subsidy to correct the externality is given by $W_{1t} = 0$, where we denote this level in sector i by t_1^{ext} . Note that since the government receives no contributions in state $\rho = 1$, $G_{1t} = W_{1t}$.

The possible values of the cap on the inefficient transfer may be summarized by the following lemma.

Lemma 2: *If there is a non-zero probability of a positive production externality then the equilibrium level of an ex ante cap set by the government on the production subsidy is positive and no greater than the optimal level to correct the externality, that is* $t^c \in (0,\, t_1^{ext}]$.

Proof:

Consider first the upper bound on the cap. In each sector, the optimal cap t^c is chosen to satisfy

[14] In the figure drawn we implicitly assume that the Pareto frontier when T is capped and t used is everywhere concave. This is not essential for the results, concavity for small values of t is sufficient.

[15] The first-order condition for the optimal cap on the lump-sum subsidy will take a similar form, as in equation (23) below.

(see the discussion after equation (20)):

$$t^c : p\frac{dG_0}{dt^c} + (1-p)G_{1t}t_{1\tilde{t}^c} = 0 \tag{21}$$

Consider the government's optimum subsidy in state $\rho = 0$. We know that $\frac{dG_0}{dt^c} \leq 0$ for any positive level of the cap t^c, because if the government were to choose a cap only when $\rho = 0$ it would choose $t^c = 0$ so that none of the policy substitutes for T. If $p > 0$ and $\frac{dG_0}{dt^c} < 0$, then (21) implies that $G_{1t}t_{1\tilde{t}^c} > 0$, so that at the optimal level of the cap, welfare in state $\rho = 1$ could be increased by raising t^c. Therefore $t^c < t_1^{ext}$. If $\frac{dG_0}{dt^c} = 0$ exactly, then $G_{1t}t_{1\tilde{t}^c} = 0$, which implies that $t^c = t_1^{ext}$.

To show that the cap must be strictly positive when $p < 1$, note that this requires:

$$p\frac{dG_0}{dt^c} + (1-p_i)G_{1t}t_{1\tilde{t}^c} > 0 \tag{22}$$

at $t^c = 0$ and $T^c = \hat{T}^c$. Since $G_{1t}t_{1\tilde{t}^c} > 0$ at $t^c = 0$, it is sufficient to show that $\frac{dG_0}{dt^c} = 0$ at $t^c = 0$ and $T^c = \hat{T}^c$. This may be shown by noting:

$$\begin{aligned}
\frac{dG_0}{dt^c} &= \frac{dG_0}{dt} \\
&= \frac{dG_0}{dT} \\
&= \frac{dG_0}{dT^c} \\
&= 0
\end{aligned}$$

where all the derivatives are evaluated at $t^c = 0$ and $T^c = \hat{T}^c$. The first and third equalities follow from the fact that when a cap on a transfer is strictly binding, a marginal increase in the cap implies an equivalent increase in transfer, with equivalent effect on utility. The second equality follows from the efficient and inefficient transfers being substitutes at $t = 0$, that is where the two types of transfers are marginally equally efficient. The last equality follows from the first-order condition for T^c in equation (23) below. □

We are now ready to show that the government gains by putting a cap on the efficient transfer and that in the resulting equilibrium, the inefficient transfer is used. More importantly we show that strictly positive values of the inefficient transfer are used in equilibrium. The basic intuition for the cap on the efficient transfer policy is similar to that in Proposition 1. The government gains from the commitment to make a lower offer. In fact the choice of a cap for T is independent of the state

of nature with an externality, since there is no bargaining over transfers in that state, and thus the previous proposition applies directly after we show the constrained Pareto frontier is concave. With the preceding definitions we can state the following proposition.

Proposition 2 *:*

Consider an economy with two states of nature, one with a production externality, $\rho = 1$, and the other without, $\rho = 0$. If the government can choose a cap on each of its transfer policies to organized groups that is common across states of nature then the political equilibrium when $\rho = 0$ will feature:

a. a cap on the efficient transfer, T, that is strictly binding iff neither player has all the bargaining power; and

b. transfers using the relatively inefficient transfer policy, t.

Proof:

a. T^c binds when $\rho = 0$ iff the government does not have all the bargaining power.

In the political equilibrium $\hat{T}^c$ must satisfy the following FOC

$$p\frac{dG_0}{dT^c} + (1-p)\frac{dG_1}{dT^c} = 0 \tag{23}$$

$$G_{0C}C_{0T^c} + G_{0T} + G_{0t}t_{0T^c} = 0 \tag{24}$$

where $\frac{dG_0}{dT^c} \equiv G_{0C}C_{0T^c}+G_{0T}T_{0T^c}+G_{0t}t_{0T^c}$ as above and similarly $\frac{dG_1}{dT^c} \equiv G_{1C}C_{1T^c}+G_{1T}T_{1T^c}+G_{1t}t_{1T^c}$. To derive the second line, note that $\frac{dG_1}{dT^c} = 0$ since the optimal values of the three policies are independent of T^c, i.e. $C_{1T^c} = T_{1T^c} = t_{1T^c} = 0$. This follows from $C_1 = T_1 = 0$ and $\hat{t}_1 \leq \hat{t}_1^c$ but not a function of T^c as is clear from (18). Note further that $T_{0T^c} = 1$ since a marginal increase in the cap T^c will induce an equivalent increase in the transfer. Therefore, in choosing T^c the government only considers $\rho = 0$. But after $\rho = 0$ is realized the method to determine the government's decision to cap T is exactly parallel to the one in proposition 1. Thus, to show the gain from capping T, a proof similar to that in proposition 1 applies provided that the Pareto frontier for $\rho = 0$ is strictly concave when T^c binds and t is available.

The slope of the Pareto frontier is $\frac{G_T}{V_T}$ if T^c is not binding. If T^c binds then any further increases in the utility of the lobby must take place via changes in contributions being exchanged for t, since as we will see $t^c > 0$ when the externality is sufficiently important. Thus,if T^c binds, the slope is $\frac{G_t dt - G_C dC}{V_t dt - V_C dC} = \frac{G_t}{V_t}$ since the equilibrium definition requires t and C to be set efficiently when $t_0 < t^c$,

i.e. for $\frac{Gt}{G_C} = \frac{Vt}{V_C}$. Therefore we have

$$\lim_{t\to 0} \frac{G_t}{V_t} = \frac{G_T}{V_T} \tag{25}$$

$$> \frac{G_t}{V_t}|_{t>0} \tag{26}$$

where the first equality is due to the definition of G and V. (See the proof of the inefficient policy lemma. Note that a key element of the proof is that as $t_o \to 0^+$, $\frac{G_t}{V_t} = \frac{G_T}{V_T}$, that is, the utility frontier for efficient and inefficient transfers has the same slope.) The inequality follows from the definition of t being inefficient relative to T. Thus the constrained Pareto frontier is strictly concave and we can apply the proof of proposition 1 to show that $\hat{T}^c$ binds.

b. $\hat{t}_0 > 0$ in equilibrium follows from Lemma 2. □

The proposition shows that if the government can cap the efficient policy it will do so even in the presence of alternative less efficient policies. This is perhaps not surprising given proposition 1, since the intuition is in fact the same: the cap allows the government to credibly commit to a lower offer. The observation that as $t_0 \longrightarrow 0^+$, $G_t/V_t = G_T/V_T$, was important to show that the frontier is strictly concave when we allow for production subsidies.

The second part of the proposition is less obvious. Why is the government making inefficient transfers in equilibrium? Why not simply increase the cap and make a similar value transfer using the efficient policy? Doesn't that leave the lobby better off and thus willing to make a higher contribution , which in turn would leave the government better off? This argument captures only the increase in the Pareto set from relaxing the cap. However, this will not translate into an increase in government welfare because relaxing the cap reduces the government's ability to make a credible offer of a low transfer, as shown in proposition 1. Thus the government will not relax the cap.

This is the key conceptual result. By constraining what it is able to offer interest groups, the government can improve its bargaining position in the trade of contributions it covets for the subsidies that interest groups desire. In the presence of such a constraint, the partial substitutability of a second inefficient transfer for the more efficient type of subsidy ensures that it will be used in equilibrium. If the second type of transfer were as efficient as the first, it would simply make the cap ineffective. It is the very inefficiency of the second transfer relative to the first that partially "protects" the gain in the bargaining position the government achieves with the cap; substituting efficient transfer for inefficient subsidies, that is, loosening the cap only erodes that gain.

If inefficient subsidies served no purpose other than as a way of transferring income to special interests, the government would be even better off if it could cap them at zero, since their existence only weakens the government's bargaining position relative to the case where only an efficient, capped transfer exists. However, even in this case in which the government would find it optimal to prohibit use of inefficient transfers that a lobby can benefit from , it is quite unlikely that it can do so. If the lobby finds one transfer policy that is not subject to a cap then the government can no longer credibly commit to a total transfer of T^c. If the inefficient subsidy increases social welfare in some states of nature and the government cannot selectively prohibit its use, (that is, make a cap conditional on which state of nature is realized), it will not be optimal to cap the transfer at zero, even if the government could do so.

Since the subsidy is not inefficient at $t_0 = 0$ the *equilibrium* value of the inefficient transfer in state $\rho = 0$ (that is, when it when it has no social value) is not zero. When the efficient transfer is exactly T^c and $t_0 = 0$, the inefficient policy is a perfect substitute for T. Therefore we know that since the cap on T is binding a positive use of t will create joint gains to the government and lobby, which brings forward contributions in exchange for a strictly positive level of t. It is crucial to note that in equilibrium the level of t is strictly positive and thus it is strictly less efficient than the original transfer despite it being a perfect substitute at $t_0 = 0$.

4.4 Export subsidies

Our result in proposition 2 applies to a broader set of policies than production subsidies, as the following corollary shows. In particular it is interesting to consider the implication of our result for trade policy, which is universally used to redistribute income towards particular factor owners even though it is inefficient relative to lump-sum transfers. As Rodrik (1995) points out in his review the use of trade policies as a form of redistribution remains an important unanswered question in trade. One particularly important transfer policy for developed countries is export subsidies in agriculture. Our previous result applies directly to export subsidies under the following conditions.

Corollary: *If good i is exported when $t = 0$ and trading costs and import tariffs on i are zero then a production subsidy is equivalent to an export subsidy and therefore proposition 2 provides an explanation for the use of export subsidies as a form of redistribution*

The corollary follows simply from the fact that an export subsidy is exactly equivalent to a production subsidy under the conditions outlined. Since we have assumed this is a small country

the domestic consumers continue to purchase the good in the world market at p provided there are no international trading costs nor import tariffs on i, so demand for i remains unchanged after a production subsidy. This implies that any extra production due to the subsidy is exported and thus the production subsidy is equivalent to an export subsidy.

5 Social Welfare Effects of Caps

The ability to commit to caps does not lower and in general raises the government's utility. What about social welfare, which is only part of the government's objective? Does the ability by the government to commit to caps does also raise social welfare?

A simple way to see that welfare must increase is to note that while caps raise the government's utility G, they lower the equilibrium contribution C that the lobby is willing to make, and hence the component $\Psi(C)$, that is, the utility the government derives from contributions. Since government utility is the sum of social welfare W (weighted by a) and $\Psi(C)$, if caps induce a fall in the latter and a rise in total utility, then social welfare W must rise.

It is also instructive to demonstrate this result by considering the effect on social welfare directly. When the only form of transfer is lump-sum payments, a cap on these transfers will clearly increase social welfare. The only effect of the cap on consumers is via the taxes they must pay to finance transfers. The fall in the equilibrium level of transfers relative to the unconstrained solution that is induced by the cap reduces taxes. Since taxes are costly to raise, the cap unambiguously increases social welfare.

If an inefficient form of transfer is also available, but is not capped, the cap on the efficient form of transfer will still increase social welfare. Since a binding cap on lump-sum transfers induces the use of inefficient transfers in place of efficient ones, the cap no longer determines the *total* level of transfers. However, since inefficient transfers (at any positive level) are an imperfect substitute for efficient transfers from the point of view of lobbies, the fall in efficient transfers from the unconstrained to the capped level will be only partially offset by an increase in inefficient transfers in equilibrium. Hence the cap induces a fall in total transfers. Since total transfers fall when there is a binding cap on efficient transfers, the argument in the previous paragraph applies. The fall in total tax collection in equilibrium implies lower total collection costs and thus higher social welfare. On the other hand, due to the substitution of inefficient transfers for the capped efficient ones, the level of transfers in this case will be above T^C so that the welfare gain from the cap is smaller than when inefficient transfers were not available.

The case of a production subsidy that is capped is more difficult, but here too the ability of the government to cap the production subsidy will increase social welfare. Suppose, consistent with Lemma 2, the cap on the production subsidy is below t_1^{ext}, the optimal subsidy to correct the externality. In this case there are offsetting effects. Raising the cap on the production subsidy increases social welfare in the state in which the externality is present, but lowers it in the state where it is absent, since a higher cap on the subsidy serves only to increase the transfer made to the lobby in this state. From the argument in the previous two paragraphs, we know that this alone serves to lower social welfare. To see that the ability by the government to put a binding cap on the production subsidy nonetheless raises social welfare, consider a binding cap t^c that is marginally below t_1^{ext} . Since at t_1^{ext} , the derivative of social welfare with respect to t is zero, the loss from restricting the subsidy in state $\rho = 1$ is second order. In contrast, the gain to restricting the inefficient transfer in state $\rho = 0$ is first order, since for strictly positive values of the subsidy, there is a first order gain from lowering the subsidy. Therefore, a cap on the subsidy must raise welfare.

6 Conclusions

Why do governments use inefficient policies to make transfers to special interests? This question has long puzzled researchers in public economics, political economy and trade policy. There are several explanations for the use of inefficient transfers. In this paper we present an alternative argument that relies on two features of the interaction between the government and special interests that we think are general, pervasive and important. First, this interaction can be characterized as one where the two parties bargain over what they have to offer to each other. Second, the government has the ability to commit to some limits on the types and/or levels of the policies that it will later bargain over.

In such a world, a key consideration is the bargaining position of the government relative to the lobbies. The government will find it beneficial to limit the power of lobbies in such a way that it receives the benefits it wants from the lobbies at a lower cost. One such mechanism is for the government to commit itself to offer less, that is, to try to cap the amount of resources it will transfer to lobbies. As we demonstrated, this commitment increases the welfare of the government because it improves its bargaining position. However, if the government caps the use of one instrument, lobbies will find other, generally less efficient ways to bargain with the government. Hence, equilibrium redistribution is characterized by the use of inefficient instruments. If such instruments serve no social purpose, the government will also want to prohibit their use, but it will certainly find it

impossible to eliminate every sort of conceivable transfer to special interests.

If the inefficient transfer has a social value at some point in time, such as a production subsidy to correct an externality, the government will not find it optimal to prohibit its use. However, it is then impossible to effectively forbid its use as a redistributive device. In our model we assume that the production subsidy can only be used as an inefficient transfer in states of nature in which it is known by all that no production externality is present. This assumption makes clear that the use of inefficient ways of transferring income to special interests is completely independent of any motive related to lack of transparency and imperfect information.

We chose a specific application to demonstrate a general mechanism that appears to be commonly used in practice by governments: restraining the amount they can offer in a subsequent bargain. A similar rationale can potentially explain the choice of inefficient transfer policies other than production and export subsidies. It can also apply in different political economy settings provided that the key bargaining elements are present. Finally, we believe that our results highlight an important methodological issue about the interaction of governments and interest groups. Currently the most common approach to this interaction is the one developed by Grossman and Helpman (1994) and Dixit, Grossman, and Helpman (1997), where lobbies have all the bargaining power and make take-it-or-leave-it offers to the government. In contrast our results are only possible if *neither* party has all the bargaining power. This strongly suggests that there is a high value to investigating alternative approaches to the interaction between governments and interest groups. That is the more general aim of our line of research.

References

Acemoglu, D. and J. Robinson (2001), "Inefficient Redistribution," *American Political Science Review* 95, 649-61.

Baron, D. (1991), "Majoritarian Incentives, Pork Barrel Programs, and Procedural Control," *American Journal of Political Science* 35, 57-90.

Becker, G. (1983), "A Theory of Competition among Interest Groups for Political Influence," *Quarterly Journal of Economics* 98, 371-400.

Becker, G. and C. Mulligan (1998), "Deadweight Costs and the Size of Government," NBER working paper 6789.

Binmore, K., A. Rubinstein, and A. Wolinsky (1986), "The Nash Bargaining Solution in Economic Modelling," *Rand Journal of Economics* 17, 176-88.

Bruce, N. and M. Waldman (1991), "Transfers in Kind: Why They Can Be Efficient and Nonpaternalistic," *American Economic Review* 81, 1345-51.

Coate, S. and S. Morris (1995), "On the Form of transfers to Special Interests," *Journal of Political Economy* 103, 1210-35.

_____ (1996), "Policy Conditionality," PIER Working Paper 97-013, University of Pennsylvania.

Dixit, A., G. M. Grossman, and E. Helpman, (1997) "Common Agency and Coordination: General Theory and Application to Government Policy Making." *Journal of Political Economy* 105(4), 752-69.

Dixit, A. and J. Londregan (1995), "Redistributional Politics and Economic Efficiency," *American Political Science Review* 89, 856-66.

Drazen, A. (2002). "Conditionality and Ownership in IMF Lending: A Political Economy Approach," *IMF Staff Papers* 49 (Special Issue), 36-67.

Fiorina, M. (1981), "Universalism, Reciprocity, and Distributive Policymaking in Majority Rule Institutions," in J. Crecine, ed., *Research in Public Policy Analysis and Management*, vol. 1, Greenwich, CT: JAI Press.

Grossman, G. M. and E. Helpman (1994), "Protection for Sale," *American Economic Review* 84, 833-50.

Kalai, E. and M. Smorodinsky (1975), "Other Solutions to Nash's Bargaining Problem," *Econometrica* 43, 513-18.

Rodrik, D. (1986), "Taxes, Subsidies, and Welfare with Endogenous Policy," *Journal of International Economics* 21, 285-99.

_____ (1995), "Political Economy of Trade Policy," in Gene M. Grossman and Kenneth Rogoff, eds., Handbook of International Economics, Vol. 3. Amsterdam: North-Holland, pp. 1457–94.

Shepsle, K. and B. Weingast, (1981), "Political Preferences for the Pork Barrel: A Generalization," *American Journal of Political Science* 25, 96-112.

Tullock, G. (1983), *Economics of Income Redistribution*, Boston MA: Kluwer-Nijhoff.

Weingast, B., K. Shepsle, and C. Johnsen (1981), " The Poltical Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics," *Journal of Political Economy* 89, 642-64.

Westcott, P., C. E.Young, and J. M. Price (2002) "The 2002 Farm Act: Provisions and Implications for Commodity Markets", Agriculture Information Bulletin no. 778.

Wilson, J.(1990), "Are Efficiency Improvements in Government Transfer Policies Self-Defeating in Political Equilibrium," *Economics and Politics* 2, 241-58.

A Formal Definition of the Political Equilibrium

In this appendix we provide a formal definition of the political equilibrium with two states in section 4 when there are $i = 1, ..., N$ interest groups.
The set $(\{\hat{T}_i^c\}, \{\hat{t}_i^c\}, \{\hat{T}_{i\rho}\}, \{\hat{t}_{i\rho}\}, \{\hat{C}_{i\rho}\})$ for $\rho = 0, 1$ and $i = 1, ...N$ forms a subgame perfect Nash equilibrium of this game if and only if
1. Caps:

$$(\hat{T}_i^c, \hat{t}_i^c) \equiv \arg\max_{T_i^c, t_i^c} \sum\nolimits_{\rho} p_{i\rho} G_\rho(\hat{C}_{i\rho}(T_i^c, t_i^c), \hat{T}_{i\rho}(T_i^c, t_i^c), \hat{t}_{i\rho}(T_i^c, t_i^c)) \text{ all } i \tag{27}$$

where $p_{i\rho}$ are the state probabilities for sector i.

2. Levels of T, t and C
a. $\rho_i = 0$

$$(\hat{C}_{i0}, \hat{T}_{i0}, \hat{t}_{i0}) \equiv \arg \max_{(G_0, V_i) \in \Omega} (G_0 - g_0^0)^\gamma (V_i - v_i^0)^{1-\gamma} \tag{28}$$

where $\Omega \equiv \{(G_0, V_i) \in P^e : G_0 \geq G_0^0, V_i \geq V_i^0\}$ [Pareto frontier]
and

i. $g_0^0 \equiv \max_{T_i \geq 0, t_i \geq 0}\{G_0(C_i, T_i(T_i^c, t_i^c), t_i(T_i^c, t_i^c))\}$ [Threat point for government]
ii. $v_i^0 \equiv \max_{C_i \geq 0}\{V_0(C_i, T_i, t_i\}$ [Threat point for lobby]
iii. $(G_0, V_i) \in P^e$ iff
$(G_0, V_i) \in P$ [the set of feasible utilities for the problem]
and
$\nexists\ (G_0, V_i)$ s.t. $T_i \in [0, \hat{T}_i^c]; t_i \in [0, \hat{t}_i^c]$ [Defining constrained efficiency] and
a. $G_0(C_i, T_i, t_i) \geq G_0(\hat{C}_{i0}, \hat{T}_{i0}, \hat{t}_{i0})$ and $V_i(C_i, T_i, t_i) > V_i(\hat{C}_{i0}, \hat{T}_{i0}, \hat{t}_{i0})$ or
b. $G_0(C_i, T_i, t_i) > G_0(\hat{C}_{i0}, \hat{T}_{i0}, \hat{t}_{i0})$ and $V_i(C_i, T_i, t_i) \geq V_i(\hat{C}_{i0}, \hat{T}_{i0}, \hat{t}_{i0})$.

b. $\rho_i = 1$

$$(\hat{T}_{i1}, \hat{t}_{i1}) \equiv \arg\max_{T_i, t_i}\{G_1(C_i(T_i^c, t_i^c), T_i(T_i^c, t_i^c), t_i(T_i^c, t_i^c)) : T_i \in [0, \hat{T}_i^c]; t_i \in [0, \hat{t}_i^c]\} \text{ for all } i \quad (29)$$

$$\hat{C}_{i1} \equiv \arg\max_{C_i \geq 0} V(C_i(T_i^c, t_i^c), T_i(T_i^c, t_i^c), t_i(T_i^c, t_i^c)) \quad (30)$$

B Alternative Bargaining Solution Concept

The Nash bargaining solution has a direct interpretation in terms of a well specified bargaining situation with alternating offers, which can be used to describe the political interaction that we analyze, as we argue in section 2.2. Therefore that is the solution concept we focus on. However, the result in proposition 1 is sufficiently important to question if it is a special feature of Nash bargaining. We consider one of the leading alternatives, the Kalai-Smorodinsky (1975) bargaining solution, and show that the result in proposition 1 also holds in this case.

Figure 7 illustrates this point. For simplicity we consider the case where the inefficient policy is not capped, although this can be relaxed as we show in the paper. Therefore the Pareto frontiers in Figure 7 are equal to Figure 4. The KS solution is found by taking the intersection of the Pareto frontier with the ray through the points (g^0, v^0) and (g^m, v^m). From this it is obvious that the government gains even from a non-binding cap, since such a cap reduces v^m without changing g^m or the relevant part of the Pareto frontier.

Moreover, the government gains from a binding cap on T. To see this, consider the auxiliary frontier defined by the straight line through g^m and $v^{mc'}$. The absolute value of the slope of this line is the same as that of the new ray through the points (g^0, v^0) and $(g^m, v^{mc'})$, thus the two must intersect at g^{KS}, the original level of utility for the government in the absence of a cap. Since the actual Pareto frontier after the cap is concave (proposition 1) the new equilibrium value is $g^{KSc'} > g^{KS}$. Thus the government will also gain from setting a binding cap on the efficient transfer if the solution concept is that of KS.

Figure 1: Efficient Transfers

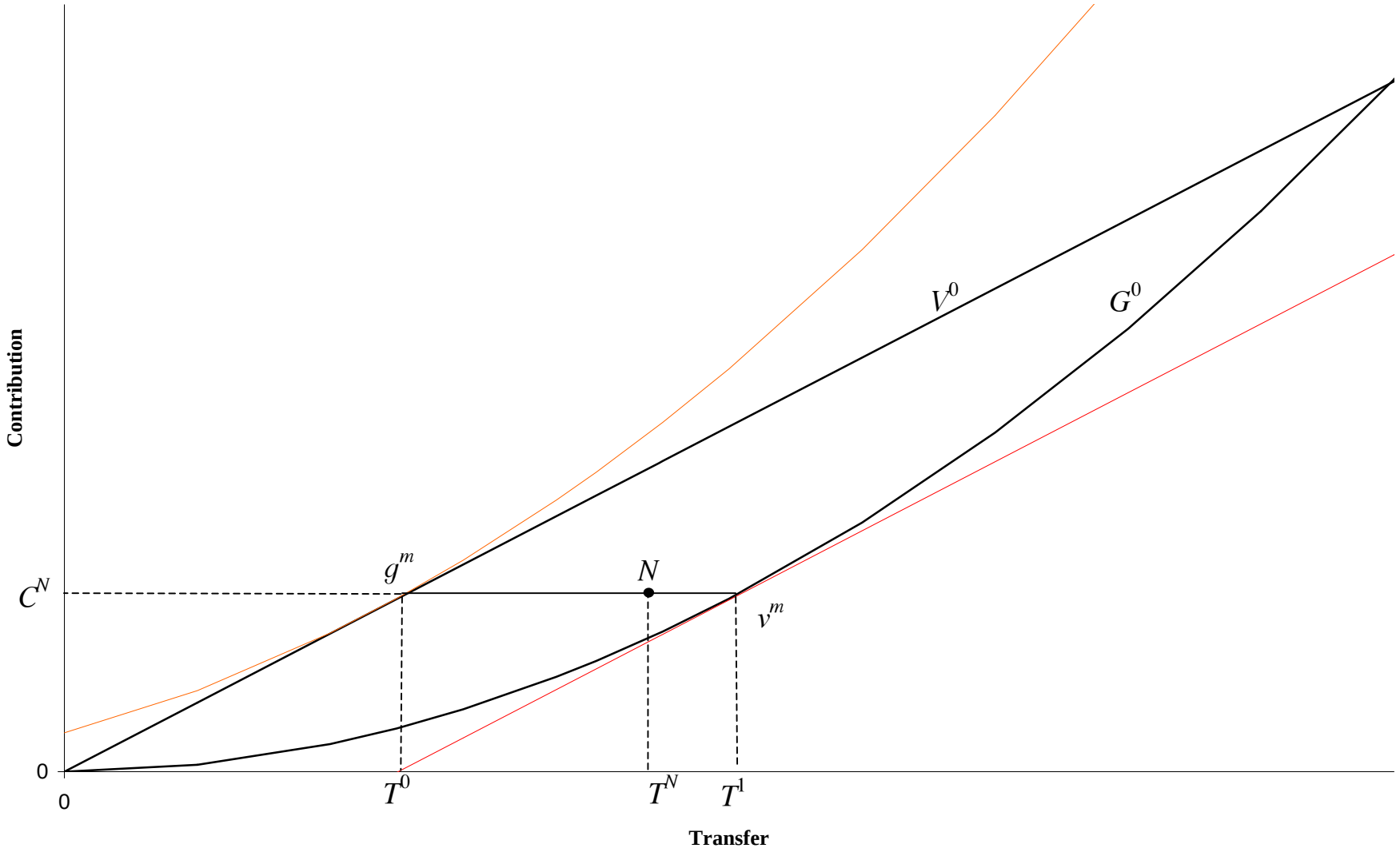

Figure 2: Bargaining Solution

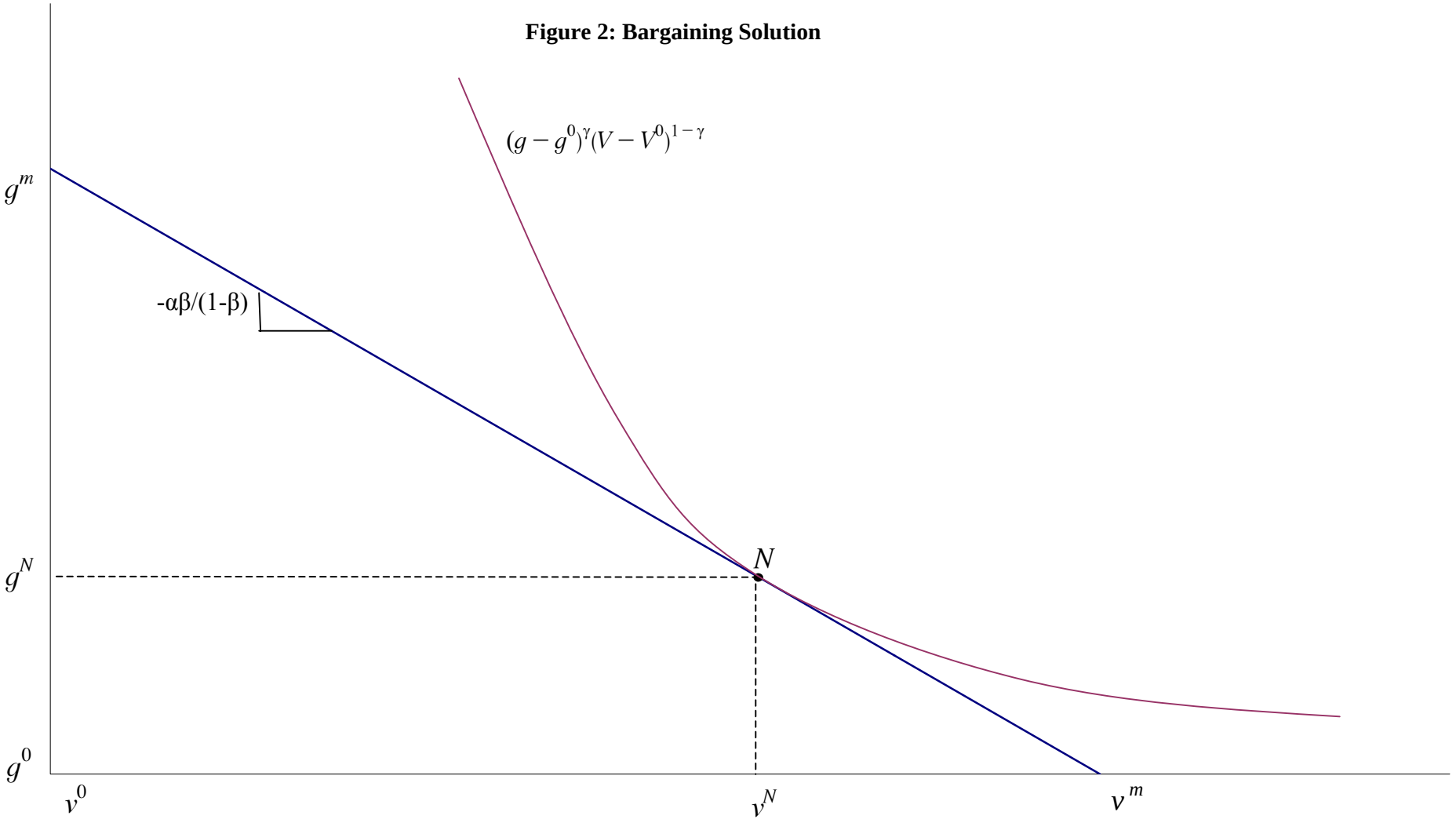

Figure 3:Cap on Efficient Transfer

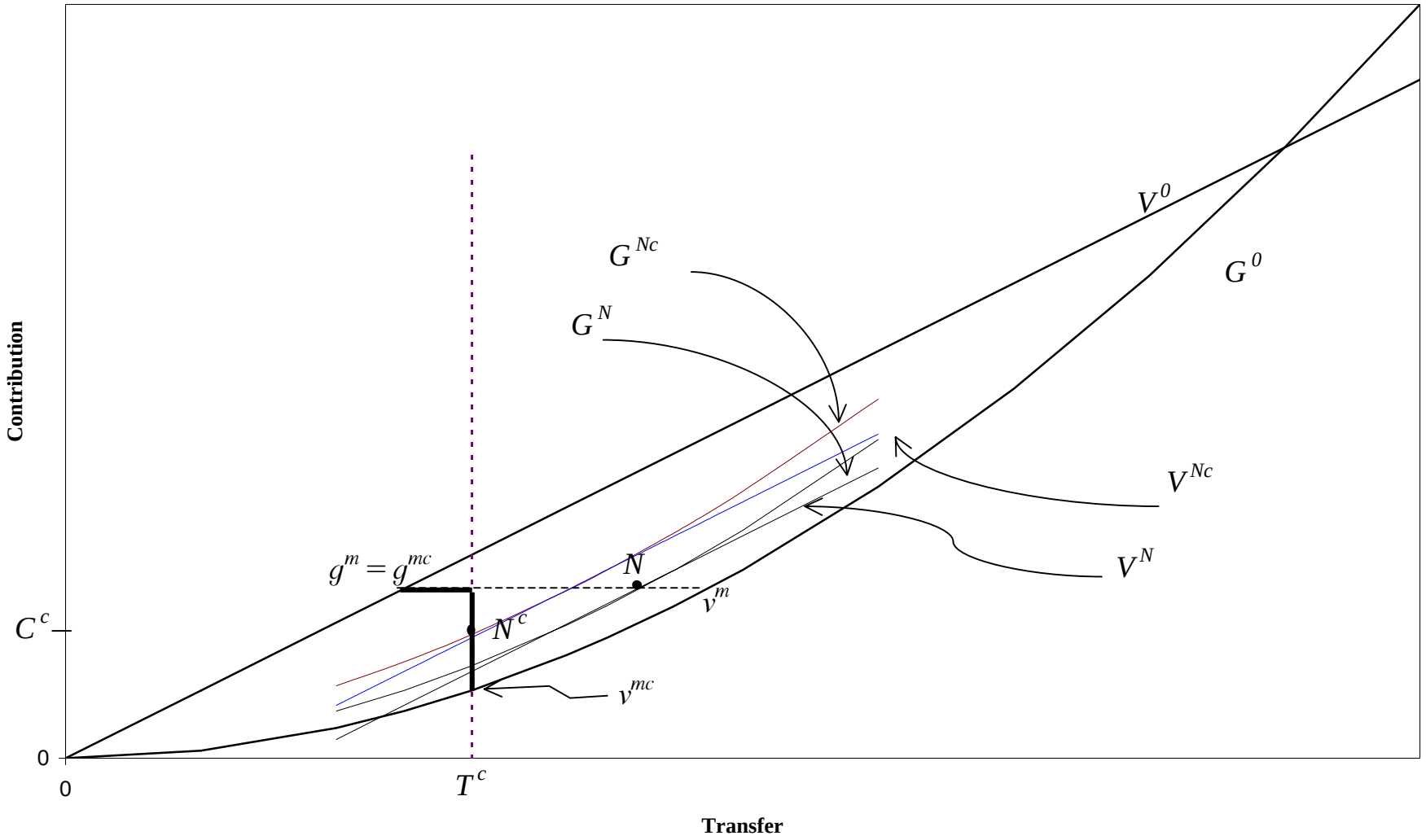

Figure 4: Bargaining Solution with Cap on Efficient Transfer

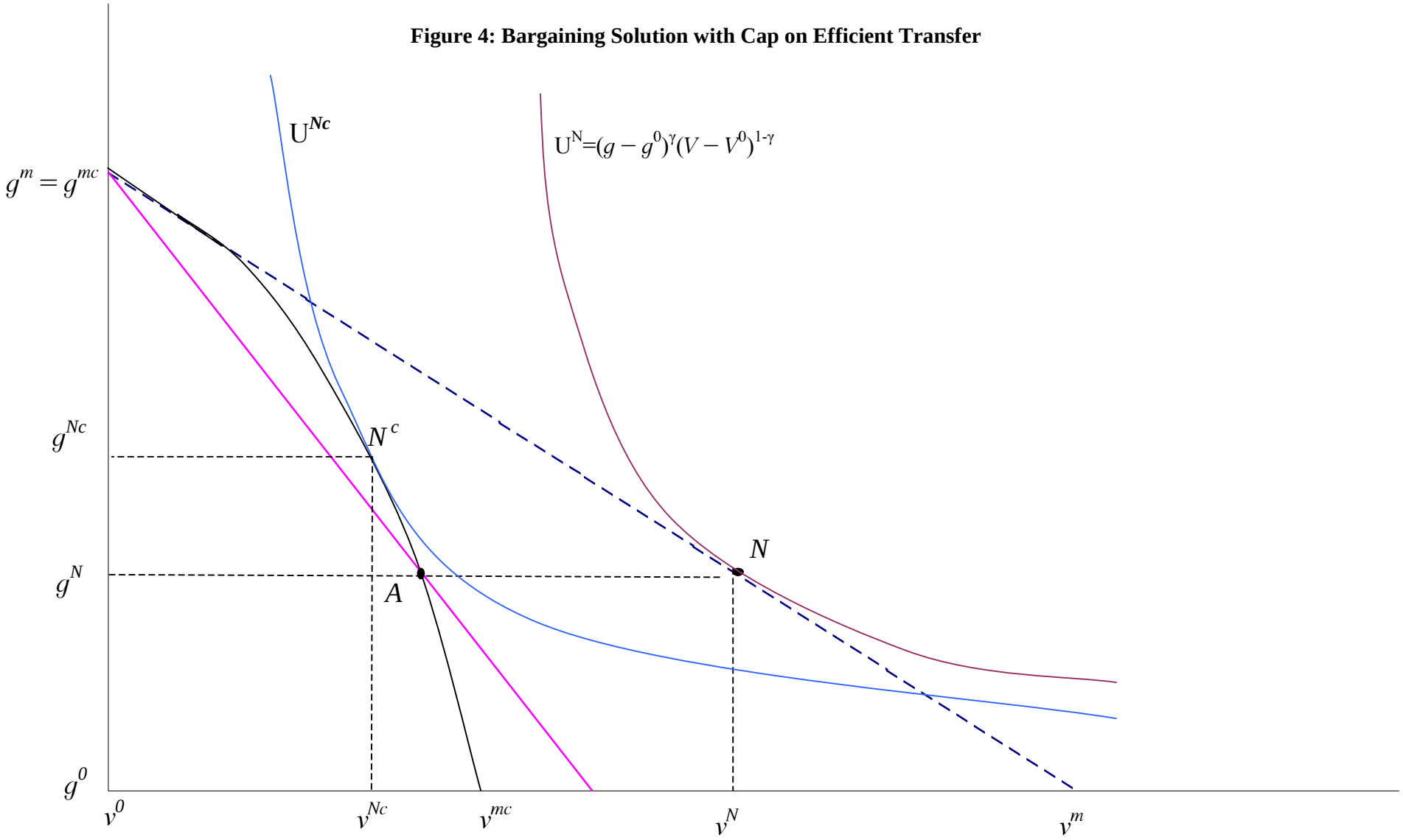

Figure 5: Definition of Inefficiency

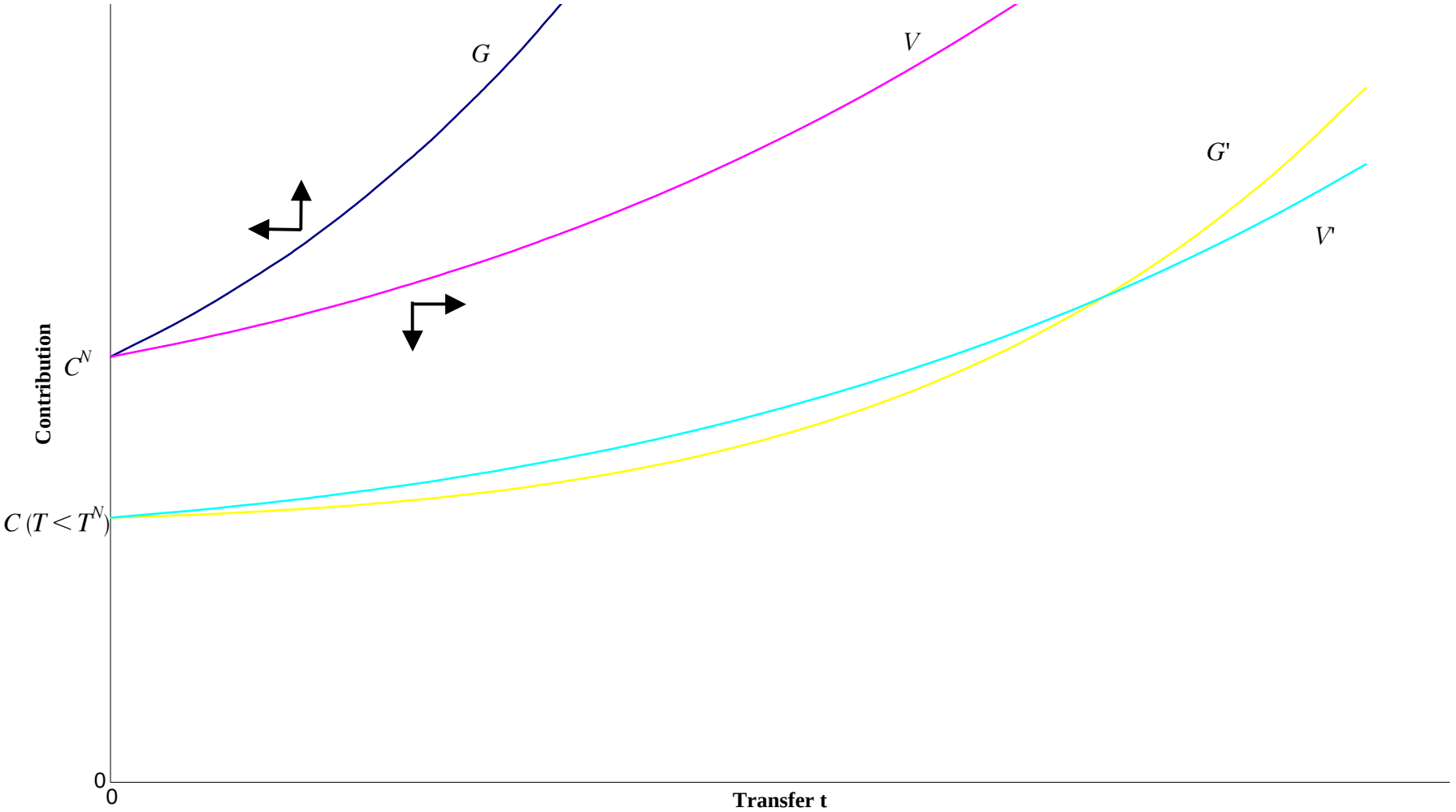

Figure 6: Inefficient Transfers- Bargaining Solution

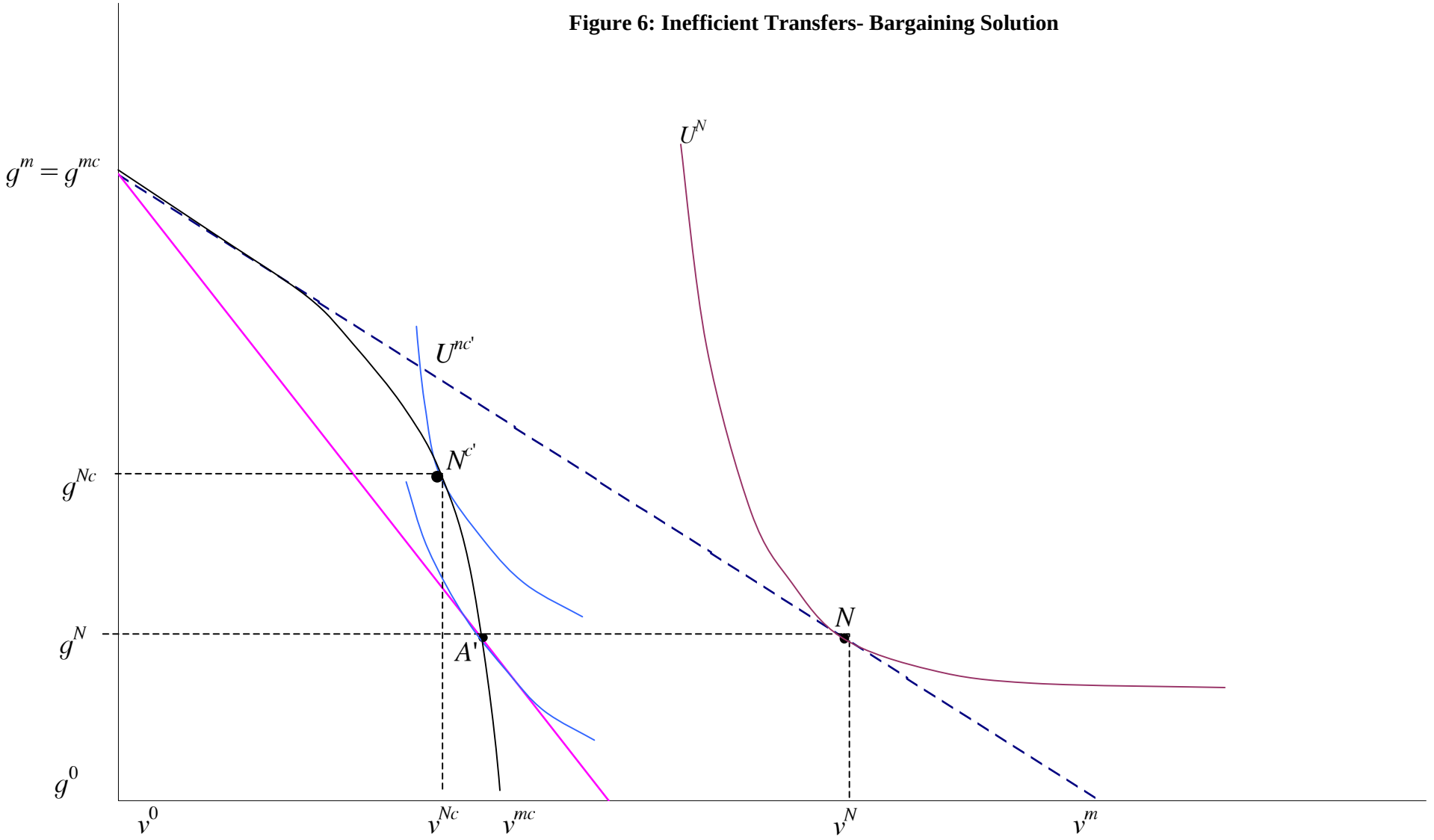

Figure 7: Kalai-Smorodinsky Bargaining