

The Roles of Transfers and Participation Constraints in Trade Negotiations

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Abstract

By extending the logic of common agencies to international institutions, this paper shows the importance of studying the transfer process among groups within a country as well as among countries in trade negotiations. The consideration of difficulty or facility in transfers as well as the consideration of individual rationality constraint is essential for understanding the incentive mechanism in trade talks under an international organization. In this simple model of asymmetric information, we show that a transfer process uses up additional resources in order to realize the intended transfer. Costly transfers render the internal and international adjustment difficult, and they tend to deter the progress of trade liberalization.

The theory of common agency has been successfully applied to analysis of government policies (e.g., Dixit (1997); Dixit, Grossman and Helpman, 1994) and policy choice of the euro zone (Dixit 2001). Under apparently reasonable conditions of individual rationality, free transfers, and incentive compatibility, the theory tells us that the common agency will serve the welfare of its principals. In other words, a government, as an agent, will serve the welfare of various interest groups, its principals; and the European Central Bank (ECB) will serve the interests of its member countries through maximizing the Benthamian contributions from the agents. Can this approach be generalized to other international institutions such as the IMF, the IBRD, the ILO and the WTO?

We answer this question in the affirmative. While a government plays the role of a common agent for domestic pressure groups, international organizations play the same role for their member states. We also show, however, that the difficulty of implementing transfer payments across countries and participation constraints for

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countries (individual rationality condition) can seriously constrain the effectiveness of such international as well as domestic institutions. The implementation of transfer payments can be impeded, even blocked, by the asymmetry of information about the amounts affecting the analysis of common agency in both international as well domestic situations.

The effectiveness of common agency has been proved under the following three conditions:

- (1) No exit condition: A principal does not have the option to exit, that is, she or he will stay as a member even if the decision does not satisfy her (his) individual preferences.
- (2) The free side-payments condition: Principals can give and receive side payments free of cost among themselves and the agent; so that the individual rationality of the participants is always satisfied.
- (3) The incentive compatibility condition: Principals are motivated to reveal their true preference to the common agent, and principals are motivated to reveal their true preferences to their agent.

We do not discuss questions related to the incentive compatibility condition (3) in the manner described here, but ask the related question how transfers are possible under asymmetry. Condition (1) and (2) are related in the sense that under (2) it is implicitly assumed that every principal will end up satisfying the individual rationality condition.

If the common agency theory were extended to an international economic institution in a straight forward manner, it should be expected to approximate a harmonious and efficient state for the world, particularly when consumers' interests are fully taken into account by their governments. In fact, the WTO appeared to be on the verge of a break-down in Cancun, and the Kyoto Protocol faces high hurdles including the United States' refusal to ratify it. We suggest that at the root of these disturbing observations lies the difficulty of making transfers across pressure groups within a country, and across countries in the world economy; and that these difficulties prevent the participants from satisfying their individually rational participation constraints. An international organization may help realize the transfers, but only with limited effect. We explore the reasons why governments and international organizations often fail to function as an effective common agency as the theory would predict. We do so by focusing on the difficulty of making direct transfers among the principals.

Coate and Morris (1995), and Dixit and Londregan (1995) analyze political, social, and economic barriers to direct transfers. Transfers are often channeled in more subtle and therefore more costly forms. For example, outright transfers are suspect because they are not clearly distinguishable from bribes, and both politicians and voters resort to more indirect forms such as projects, and celebrations (Coate and Morris, 1995).

Or, lump-sum transfers to compensate for the loss of welfare arising from policy changes will involve additional cost for informational and political reasons (Dixit and Londregan, 1995). By abstracting various elements in Dixit and Londregan (1995), we propose a simple theory in which the asymmetry of information among principals and agents impedes transfer payments in both international as well as domestic domains. When the agent does not know exactly each constituent's loss or gain resulting from a policy action, it is led to over-compensate or under-tax most principals, rendering the whole scheme infeasible.

Later in this paper, we adapt the idea of the two-level games (Putnam, 1988) of tariffs, and introduce a two-level game of the world economy, incorporating the cost of implementing transfer payments. The function of an international organization is limited by the difficulty of transfers among domestic groups as well as among nations.

Our partial equilibrium trade model of tariff determination uses only a small number of sectors and policy instruments. In order to highlight the crucial role of transfers, we make the model as simple as possible. This simple structure allows us to demonstrate clearly the basic logical structure implied in the model of agencies with explicit attention to participation constraints (cf. Saijo and Yamoto, 1999) and the difficulty or the ease of making transfers. The interactions between the transfer possibilities across nations and those within a nation present a series of interesting observations.¹

1 A Simple Model of Mutual Tariff Determination

We start with simple partial equilibrium analysis of an international negotiation on tariff rates. Country 1 is a developing country and Country 2 is industrialized. The developing country exports agricultural good A and the industrialized country exports manufactured good M . Tariffs are the only policy instruments available to influence trade. The industrial country imposes tariff t_a on good A , and the developing country imposes tariff t_m on good M . There is no room for export subsidies for either good. The bliss levels of tariffs for the two countries from the point of view of domestic producers are a for the agricultural good in the industrialized country and m for the manufactured good in the developing country. Note that t_m is the only strategy for the developing Country 1, and t_a is the only strategy for the industrialized Country 2. An international institution like the World Trade Organization (WTO) exists and we call it an International Trade Organization (ITO). [See Figure 1 for the setting of the world economy.]

The objective of the developing country of a similar size is to minimize the sum of losses to its two sectors. Consumers' welfare is ignored at the beginning because the consumers are too numerous, and the per capita effect of policy is so small that it does

¹Similar properties can be generalized, we conjecture, to a general equilibrium model of trade talks (e.g. Grossman and Helpman, 1995).

not justify the cost of organizing to influence government policy. This assumption will be relaxed later. The national loss function is thus composed of the loss to the manufacturing sector due to imports and the loss to the agricultural sector arising from the Country 2 tariff on the agricultural good. In other words, the first term represents the damage to the manufacturing sector when the tariff level deviates from the optimal level m , and the second term represents the damage to the agricultural sector when the tariff in its trading partner, the industrialized country, deviates from zero. The benefit of joining the ITO, or of joining the club by itself, is neglected at the beginning. Formally, the loss to Country 1 can be written as follows:²

$$L_1 = \gamma_{11}(t_m - m)^2 + \gamma_{12}t_a^2, \quad (1)$$

where γ 's are the weights of the losses to the two sectors.

Similarly, the objective function of the industrial country is expressed as the sum of the loss of the manufacturing sector by the tariff of the developing country and the loss of the agricultural sector due to the deviation of the tariff on agricultural good from the most desired level a

$$L_2 = \gamma_{21}t_m^2 + \gamma_{22}(t_a - a)^2 \quad (2)$$

We begin with the simple case where $\gamma_{11} = \gamma_{22} = 1$, and $\gamma_{12} = \gamma_{21} = \gamma$:

$$\begin{aligned} L_1 &= (t_m - m)^2 + \gamma t_a^2, \text{ and} \\ L_2 &= \gamma t_m^2 + (t_a - a)^2. \end{aligned}$$

In the absence of an international organization, the developing country, Country 1, gains by making t_m equal to m , and the agricultural sector of Country 1 when the tariff rate of the industrial Country 2 is equal to zero. Similarly, the agricultural sector of the industrial country, Country 2, gains by making the tariff rate t_a equal to a , and when the tariff rate of Country 1 on manufactured good is equal to zero. Therefore, the non-cooperative behavior yields the Nash equilibrium, with the tax instruments taking values $t_m = m$ and $t_a = a$, and the total loss to the world equals $\gamma(m^2 + a^2)$.

This loss creates the opportunity for a global trade organization to take an agency role. Grossman and Helpman (1995) discuss the situation where an international institution works "as if" it were a common agency. One of the reasons they do not treat an international trade organization as a common agency may be that substantial transfer payments across countries are rarely possible. Given Dixit's (2001) treatment of the European Central Bank as a common agency, it is only a short step to treating other international organizations as a common agency. We proceed to take exactly that step. Both countries offer incentive schedules to induce the international organization to set the appropriate bounds on tariffs. In this paper, we abstract away

²Krugman and Obstfeld (2003, Appendix to Chapter 9) suggest that the welfare loss is expressed by a quadratic form.

from the question of incentive compatibility within the principal-agent relationships and focus on the role of transfers: The participating countries truthfully reveal the marginal benefits and costs of the decision of the international organization.

Let us suppose that an international trade organization (ITO), something like the WTO,³ sets the maximum levels of tariffs for both goods (i.e., for both countries) at T_m and T_a , so that $t_m \leq T_m$ and $t_a \leq T_a$. It is clear from the set-up that the industrial sector of the developing country, Country 1, gains if t_m is set equal to T_m , and the agricultural sector of Country 1 gains when the tariff rate of the industrial country, Country 2, is equal to zero. Similarly, the agricultural sector of Country 2 gains if the tariff rate t_a is set to T_a and its manufacturing sector gains when the tariff rate of Country 1 on manufactured good is zero.

Even though our main purpose is to introduce the costly transfers into the model, we start from the conventional assumption of costless transfers between nations. If the ITO is the common agency of the two countries along the standard line of analysis by Bernheim–Whinston (1986), Dixit–Grossman–Helpman (1997) and many others, Country 1 will signal its intentions by offering a schedule $-L_1 + \text{Const.} = -[(t_m - m)^2 + \gamma t_a^2] + \text{Const.}$. Similarly, Country 2 will signal its intentions by offering a schedule $-L_2 + \text{Const.} = -[(t_a - a)^2 + \gamma t_m^2] + \text{Const.}$. Then, the ITO sets the maximal allowable level of tariffs by minimizing the cost

$$L_1 + L_2 = [(T_m - m)^2 + \gamma T_a^2] + [\gamma T^2 + (T_a - a)^2], \quad (3)$$

with respect to T_m and T_a . Under the assumption of costless transfers, countries do not need to worry about the participation constraints because costless transfer will always create the situation where individual rationality is satisfied. Accordingly, they do not need to worry about the breakdown of the ITO, and set the tariff levels at permissible maximums, $t_m = T_m$ and $t_a = T_a$. The optimal tariff levels for the ITO are

$$T_m = m/(1 + \gamma), \text{ and } T_a = a/(1 + \gamma). \quad (4)$$

Country 1, which used to incur the loss of $L_1^0 = \gamma a^2$, will now incur the loss because now $t_m = T_m m$

$$L_1 = \left[\frac{\gamma}{\gamma + 1} \right]^2 (m^2 + \gamma a^2). \quad (5)$$

Country 2, which used to incur the loss of $L_2^0 = \gamma m^2$ by putting $t_a = T_a a$, will incur the loss of

$$L_2 = \left[\frac{\gamma}{\gamma + 1} \right]^2 (\gamma m^2 + a^2). \quad (6)$$

The ITO decision reduces the total world loss of the world from $\gamma(m^2 + a^2)$ to $(\frac{\gamma}{1+\gamma})\gamma(m^2 + a^2)$.

³We use the word ITO to make clear that this is not the actual WTO. Needless to say, ITO is neither equal to the “International Trade Organization,” an organization that was supposed to be born with the GATT but turned out only to be a dream.

The reduction in losses may not be positive for each participating country. For the above solution to be a genuine common agency solution, it must also satisfy the individual rationality constraint or the participation constraint for each country. That is, for Country 1, the change in loss must be positive or it should receive sufficient transfer payments from Country 2 to make the net change positive.

$$L_1^0 - L_1 = \gamma a^2 - \left[\frac{\gamma}{\gamma + 1} \right]^2 (m^2 + \gamma a^2) = - \left[\frac{\gamma}{\gamma + 1} \right]^2 m^2 + \gamma \left[1 - \left(\frac{\gamma}{\gamma + 1} \right)^2 \right] a^2 \geq 0 \quad (7)$$

This inequality does not necessarily hold. If m is much larger than a , the above inequality is violated. Unless sufficient transfers are made, Country 1 may lose by following its decision to join the ITO. In other words, if the optimal level m (which equals to the initial level) of tariffs is high, the developing country will lose by participating in the ITO unless it receives compensating transfers.

By the same token, Country 2 must satisfy its own individual rationality constraint, which is violated if a is much larger than m .

$$L_2^0 - L_2 = \gamma m^2 - \left[\frac{\gamma}{\gamma + 1} \right]^2 (\gamma m^2 + a^2) = - \left[\frac{\gamma}{\gamma + 1} \right]^2 a^2 + \gamma \left[1 - \left(\frac{\gamma}{\gamma + 1} \right)^2 \right] m^2 \geq 0. \quad (8)$$

Figure 2A illustrates the case when both conditions (7) and (8) are satisfied, and 2B or 2C shows the case where (7) or (8) is not satisfied. That is, if the degree of agricultural protection is much larger in Country 2, Country 2 will lose by following the decision of the ITO. Needless to say, one or the other or both countries will gain; both cannot lose simultaneously.

Let us consider the case when Country 1 loses by joining the club. When $(L_1^0 - L_1)$ is negative, it is difficult for the ITO to function as a mediator, or as a common agent unless the transfer payment $Y \geq L_1 - L_1^0$ is paid from country 2 to 1. Whenever one country loses, some transfer payments are required. Therefore, in order for the ITO to function properly for the welfare of the world, the role of transfers is critical. In the next section we examine conditions for transfers to be feasible.

2 A Simple Derivation of the Cost of Transfer

Now our model departs from the standard common agency literature and from the trade war literature in an important respect. We explicitly consider the cost of transfers among pressure groups (or among countries). In this section, we present a simple justification for the statement that transfers involve additional costs. We focus on the political-economy element among many other reasons in order to derive the cost or the dead-weight loss incurred in the transfer process. We dwell on the observation that politicians cannot observe the losses and gains to various parties. This property was implicitly treated in the Dixit and Londregan (1955) model along

with other elements. We focus on a single factor in their model as the cornerstone of our formulation.

Each organization consists of many individual economic agents. Even in international organizations, the number of participating nations can exceed scores if not hundreds. A crucial assumption is that the national government (or the international organization) does not know the exact amount of the loss from trade negotiation incurred by each individual member of a pressure group (or nation). Conversely, the government (or the international organization) also does not know the exact amount of the gain to each individual of a pressure group (or nation). By assuming this asymmetry of information between the government and those who will be receiving or paying a piece of the lump-sum transfer, we obtain the following seldom-noticed results.

In our example, Country 1, “a developing country,” has two sectors, agriculture and manufacturing. Initially, the manufactured good is heavily protected at the tariff rate m optimum for the sector. Under the tariff rate m , the price is P_m^0 and the protected manufacturers in this country enjoy the producers’ surplus P_m^0CN shown in Figure 3A. Under the ITO agreement, the tariff rate on manufactured goods is reduced to t_m , and the price level drops to $P_m^1 < P_m^0$. The producer surplus is reduced to area P_m^1AN , and Country 1 loses surplus given by the area of echelon $P_m^0CAP_m^1$.

On the other hand, suppose Country 1 gains from the reduction of agricultural tariff in the industrialized Country 2. The domestic price of the agricultural good in Country 1 increases from P_a^0 to P_a^1 ($P_a^0 < P_a^1$), and the producers’ surplus increases from area $P_a^0A^0B$ in Figure 3B to area GDB . The gain to Country 1 is the area of echelon $P_a^1CAP_a^0$.

The conventional argument is that transfers resolve the distributional conflict between the agriculture and the manufacture sector as long as the gain $P_a^1CAP_a^0$ is larger than the loss $P_m^0CAP_m^1$. Our claim in this paper that if one takes into account the political-economy aspect of the information asymmetry, the incumbent government must pay much more than the tax they can collect to implement the transfers.

For simplicity, let us assume that the government is a common agency motivated by the contributions that reveal true losses and gains to groups, and that the incumbency is determined by the majority voting rule. Distributing the total loss $P_m^0CAM^1$ equally among the manufacturers will leave about more than one-half of them over-compensated while the others are under-compensated for the consequences of tariff reduction. If the manufacturer casts votes to elect the government, the government which does not know the losses of individual manufacturers must spend more than the total amount of $P_m^0CAM^1$. If the government gives subsidies of HP_m^1 equally, as indicated by the shaded area, then the voters along VV' will not support the government. The shaded area must be financed from elsewhere in order to secure the votes of all the manufacturers.

Since this nature of transfer payments is the key to our argument, allow us to

repeat the explanation by a simple example illustrated in Figure 4. Suppose there are three manufacturers in Country 1. Suppose under the negotiated deal the price drops from P_m^0 to P_m^1 and the supply quantity drops from 3 to 2 units. The total loss of surplus to the industry = the sum of the losses to the manufacturers:

$$X = (P_m^0 A_1 GH) + (A_1 A_2 EF) + (A_2 A_3 BC) \quad (9)$$

How does the government (or ITO) allocate X among the three manufacturers if it does not have access to their private information (cost or private supply functions)? Consider three possible solutions.

Solution A: Fix the price of manufactured goods at P_m^0 . This is the initial solution before the reduction of tariffs.

Consequences: Emerge the price administration costs; black market; loss of opportunities to reallocate resources away from manufacturing. Nor does this solution put the highest cost Producer 3 out of business.

Solution B: Obtain X in equation (9) as the compensation payments for the sector and distribute it among all manufacturers in proportion to their production which will be like $P'_m S'$.

Consequences: Producers 1 and 2 would be unhappy (being worse off than before the trade negotiation), and Producer 3 would be happy (getting more than his loss). The government is voted out by 2 to 1 if the manufacturers are its only constituency.

One can do the same exercise for consumers who gain from the tariff reduction. In addition to the difficulty that arises from asymmetric information, the situation is made more complicated if the consumers are not sensitive to small changes in taxes and subsidies. Per capita changes in the welfare of individual consumers are likely to be small relative to the changes in the welfare of producers and the cost of organizing at mass scale.

There are several conventional explanations for why transfer is difficult: People are not altruistic. The government may not be viewed as a neutral arbiter by all parties. We add to these conventional explanations the importance of asymmetric information regarding individual characteristics of the transfer between payees and payers. The following features of information asymmetry and the cost of transfers are narrowly defined in this paper.

First, the loss resulting from transferring income will be maximum when the recipient industry (Country 1 manufacturing in our example) ceases to produce, and, similarly, when the paying industry (Country 1 agriculture) begins to produce; the loss triangle in Figures 3A, 3B will be the largest. A corollary to this is that the same magnitude of tariff reductions will incur smaller deadweight losses due to asymmetry of information if it were implemented in two or more steps. Gradual tariff reduction can be less costly.

Second, if the incumbent government is strong and stable, this type of transfer cost can be small because the government can afford to lose some votes in specific sectors. If the incumbent government is politically weak, it would be difficult for

the government to yield tariff concessions for the fear of losing political support by incurring large net transfer payments.

Third, with this type of deadweight burden in the process, even the governments that take full account of the gains and losses to consumers will not achieve the Pareto efficient resource allocation. Grossman and Helpman (1994) suggest, at least, implicitly, that in the absence of transfer costs, the governments that fully consider the welfare of consumers can realize the efficient state of the free trade through the common agent function of the international organization. In such a case, the ITO will try to minimize the deadweight loss by setting the tariff limits to zero. It is clear that this process cannot work under the presence of transfer costs generated by information asymmetry, as explained in this paper.

The above explanation of why transfers are difficult applies naturally to the cost of domestic transfers in a country. It also applies to international transfers if it is difficult to distinguish among the losses and gains to individual countries. International transfers are even more limited than domestic transfers. This can be seen by comparing foreign aid as a percentage of the GDP to the cost of social security, food and medicaid programs as a percent of the GDP. The capability of international institutions to effect transfers across countries is almost negligible.

3 The Effect of the Difficulty of Transfers on International Negotiation

3.1 Difficulties in transfers across countries

We now turn to the question of how the difficulty in transfer payments affects the functioning of international organizations..

Let us begin with the need as well as the difficulty of international transfers. If the optimal reactions expressed by equations (7) and (8) satisfy the individual rationality conditions, there is no need to worry about the participation conditions and no need for transfer payments. Even if they violate the participation constraints, as long as the transfer payments can be made without frictional costs, the optimal reactions can be supported by the appropriate transfers. When transfers incur additional costs, and when the optimal reactions do not satisfy the participation constraints, the ease of transfers will affect the outcome of the common agency problem.

Suppose that β^* is the cost of facilitating each dollar of international transfers. If the amount of transfer is Y , β^*Y evaporates. We have explained the reason for this cost in the preceding section. This cost is the excess subsidy claimed by losers and the insufficient tax paid by the gainers. It is a loss to the ITO or the government implementing the transfer but not a loss to the economy as a whole.

Assume that it is the developing Country 1 that needs to receive the transfer payments. In other words, inequality (7) is assumed to be violated. By construction

both countries do not simultaneously require transfer payments through the ITO. The ITO must minimize the following cost that includes the evaporated amount of wealth during the transfer.

$$\Gamma = [(T_m - m)^2 + \gamma T_a^2] + [\gamma T_m^2 + (T_a - a)^2] + \beta^* C_{21} + \beta^* C_{12} \quad (10)$$

where $C_{21} = \{[(T_m - m)^2 + \gamma T_a^2] - \gamma a^2\}$ if $\{[(T_m - m)^2 + \gamma T_a^2] - \gamma a^2\} \geq 0$, and
 $= 0$, otherwise.

And, where $C_{12} = \{[\gamma(T_m - m)^2 + T_a^2] - \gamma m^2\}$ if $\{[\gamma(T_m - m)^2 + T_a^2] - \gamma m^2\} \geq 0$, and
 $= 0$, otherwise.

Note that C_{21} and C_{12} can be both zero, in which case the internal minimization of (3) does not interfere with the participation requirements, and the analysis goes exactly like the standard case analyzed by many authors without transfer costs. C_{21} and C_{12} cannot be both simultaneously positive. Because the total cost without transfer cost is already minimized over the initial conditions, at least one party is better off after the ITO interventions and without transfers. An interesting case is where one of C_{21} and C_{12} is non-negative.

Let us start from the case where C_{21} is positive, that is the developing country needs to receive transfers. Then the ITO will determine T_m and T_a in such a way as to minimize

$$\Gamma = [(T_m - m)^2 + \gamma T_a^2] + [\gamma T_m^2 + (T_a - a)^2] + \beta^* \{[(T_m - m)^2 + \gamma T_a^2] - \gamma a^2\}. \quad (11)$$

Minimization is achieved when

$$T_m = \frac{1 + \beta^*}{1 + \gamma + \beta^*} m, \text{ and } T_a = \frac{1 + \beta^* \gamma}{1 + \gamma + \beta^* \gamma} a. \quad (12)$$

From these decision rules, one can see that when the international transfers are extremely difficult; that is, β^* approaches unity and all transfers are consumed during the process to realize the transfer, the value of T_a moves little from a , and the value of T_m moves little from m . The ITO can do little to help create a freer trade regime. In Figure 5, the utility isoquants of Country 1 and of Country 2 are drawn as ellipses centered on $(m, 0)$ and $(0, a)$. Assuming that the initial position is (m, a) , both the isoquants pass through (m, a) . The ITO chooses a point C on the contract curve. In our formulation, C_1 is on the line connecting the origin and (m, a) . In Figure 5A, point C corresponds to equation (4) without the need for transfers, and, in Figure 5B, point C_2 needs transfers. Then the final solution ends up at some point like D on the expressed by equation $C_{21} = 0$.⁴

⁴One would like to use another solution concept for this negotiation game, for example, the Nash bargaining solution. In that case, the question remains how the degree of bargaining strength is defined in the domestic or the negotiations.

3.2 Difficulties in the transfers among groups in the country.

Difficulties in transferring income from one interest group to another within a country create problems similar to those associated with transferring income from one country to another. Suppose the manufacturing sector in Country 1 and the agriculture sector in Country 2 are the two groups that are affected unfavorably by the ITO decisions. Our analysis of the consequences of information asymmetry in the process of transfers directly applies to this case.

Assume that fraction β_1 of the transfer within Country 1 and that fraction β_2 of the transfer within Country 2 will be needed as additional resources to keep the balance in the respective political economies. Then the conditional non-linear programming related to equation (10) can be reduced to a fairly simple problem of minimizing the cost depending on where the solution lies. For example, if manufacturers in Country 1 and farmers in Country 2 are to receive transfers, then the ITO will end up choosing T_m and T_a to minimize

$$\Gamma = [(T_m - m)^2 + \gamma T_a^2] + [\gamma T_m^2 + (T_a - a)^2] + \beta_1(T_m - m)^2 + \beta_2(T_a - a)^2, \quad (13)$$

which yields ITO's optimal solutions.

$$T_m = \frac{1 + \beta_1}{1 + \gamma + \beta_1} m, \text{ and } T_a = \frac{1 + \beta_2}{1 + \gamma + \beta_2} a. \quad (14)$$

The degree of resistance to reduce tariffs is related to the difficulty of transfers within a country. These results are superimposed on the effect of the difficulties in achieving transfers across countries.

So far we have neglected the role of government in representing the welfare of consumers. The mutual benefits due to free trade, that is, the non-zero-sum nature of tariff negotiations can be formulated as adding a new term at least partly representing the benefit to consumers in the objective function of the ITO, for example, $\mu(t_m^2 + t_a^2)$, which will be equal to $\mu(T_m^2 + T_a^2)$. Consider the case where no cost is involved in transfers. Incidentally, the condition that the world welfare will be improved from moving the initial tariff situation to free trade is $T_m = \frac{1}{1+\gamma+\mu} m$, and $T_a = \frac{1}{1+\gamma+\mu} a$. The condition for the oft-mentioned proposition that the managed trade under the ITO is better than the initial tariff situation is $(\lambda + \mu) > 0$. These tariff levels will be obtained when the ITO takes full account of the world consumers' welfare even though each country does not take account of its own consumer welfare. If the benefits to consumers in both countries are fully accounted for, the total loss function for the ITO is reduced to

$$\Gamma = \mu(T_m^2 + T_a^2) \quad (15)$$

and the free trade situation $T_m = T_a = 0$ yields the optimal solution.

Even in this ideal condition with full representation of consumers, if we introduce the cost of transfer and participation constraints, the reader will see that a free trade

solution is difficult to achieve. For, by substituting eq. (13) into eq (13) with

$$\Gamma = \mu(T_m^2 + T_a^2) + \beta_1(T_m - m)^2 + \beta_2(T_a - a)^2$$

which yields $T_m = \frac{\beta}{\mu + \beta_1}m$ and $T_a = \frac{\beta_2}{\mu + \beta_2}a$. Both are not zero. (16)

4 The Breakdown of International Negotiation

The reason for the possible impasse in an international negotiation can be analyzed by considering a multiple country situation where $j = 1, 2, \dots, J$, are J developing countries with bliss (to the local manufacturers) tariff points m , and where $i = 1, 2, \dots, I$, are I industrialized countries with bliss (to the local farmers) tariff points a . The objective function of the ITO is

$$\Gamma = J[(T_m - m)^2 + \gamma T_a^2] + I[\gamma T_m^2 + (T_a - a)^2] + \Pi(J + I). \quad (17)$$

Π is the total benefit for the members that depends on the number of countries in the international institution. If a country wants to deviate from Nash equilibrium solutions by using the threat strategy of exit, it may not affect other countries. But if a group of countries unites and threatens to exit from the group, the threat can be effective. It remains to be seen how the resulting tariff values depend on this threat of exit. In the politics of the WTO, for example, the formation of the Group of 20 middle-income countries led by Brazil, India and others seems to have worked as a useful threat to open the agricultural market of industrialized countries.

5 Concluding Remarks

Using a simple partial equilibrium framework, in this paper we attempt to extend the logic of common agencies to international institutions. We argue that the consideration of difficulty or facility of transfer payments is essential for understanding the functioning of an international organization; that the consideration is critical if we consider the individual rationality constraint; and that the cost involved in making transfers can be derived in a simple setting where politicians do not know the gain or loss to each individual producer or each consumer from a change in trade policy trend.

Our paper implies that many issues are concealed behind the following sentence by Dixit (1997, Appendix p.160), though this is the standard procedure in the common agency literature.

“The (payment) merely acts to transfer income between the parties, for example to make sure that the agent gets enough utility to make it worth his while to participate in this activity. The interests of all parties are best served by...(maximizing) the total surplus.

We hope that our analysis has shown the importance of studying transfer processes in the international as well as the domestic economy.

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