Accession Rules and Trade Agreements:

The Case of the WTO

by Eric W. Bond*, Stephen Ching**, and Edwin Lai**

* Department of Economics, Penn State, University Park, PA 16802

**Department of Economics and Finance, City University of Hong Kong

I. Introduction

When the General Agreement on Tariffs and Trade was initially signed in 1947 there were 23 contracting parties. By the end of 1998 the World Trade Organization had 134 members, with another 30 countries having applied for admission. The current membership accounts for almost 65% of world population and 90% of world trade, with those countries in the application process accounting for an additional 30% of population and 8% of trade (Langhammer and Lucke (1999)). Thus, if the current applications are successful the multilateral trading system will have been expanded to include virtually all of international trade.

Of course, this process has not been without controversy as the recent negotiations for China's entry suggest. Countries applying for membership complain that members attempt to extract unusually severe commitments for membership. On the other hand, member countries are concerned that entrants are free riding on the results of previous rounds of tariff negotiations. The purpose of this paper is to examine how an accession process for a trade organization like the WTO affects the distribution of gains from expanding the agreement between the member countries and the acceding country. The analysis in this paper will focus on two aspects of expanding a trade agreement. The first is the role of the most favored nation (MFN) principle, which requires that the member countries extend tariff reductions negotiated in previous rounds to the acceding country. Member countries are allowed to discriminate against countries that are not members of the agreement, so entry to the agreement may be valuable for outside countries in order to obtain MFN treatment. However, the extension of MFN treatment can also create losses for the member countries because the cost of tariff reductions previously negotiated may rise when they are extended to new countries.

The second issue is the role of the principal supplier rule, under which trade negotiations between members are conducted by having the principal supplier of a product makes requests of importing countries for tariff concessions. If outside countries are principal suppliers of products, then

the tariff reductions of the member countries may not have made reductions on products that are of interest to the non-member countries. The principal supplier rule suggests that a major benefit of membership is the ability to participate in negotiating rounds, since this will give the outside country the ability to propose tariff reductions on its export products.

Our research is related to several strands of the international trade literature. Caplin and Krishna (1987) were the first to analyze the strategic aspects of the MFN principle in trade negotiations. They provided examples of how the MFN principle could affect trade negotiations in a simultaneous bilateral bargaining game, and also provide an example of how it can affect payoffs when countries are engaged in a sequential alternating offers bargaining game. More recently, Bagwell and Staiger (1999b) emphasize the role of MFN as eliminating bilateral opportunism between the member countries. Bilateral opportunism arises because when one country makes a tariff concession to another, it may affect the value of a concession that has already been made with a third country. Countries may refuse to negotiate on a bilateral basis because of the concern that once the negotiations have been concluded, the partner will make new deals with other countries that reduce the value of the concession received. Bagwell and Staiger argue that by incorporating an MFN principle and a reciprocity rule, the GATT eliminates the bilateral opportunism problem.[1] Our approach to thinking about the accession process is similar in the sense that we argue below that the accession process attempts to compensate countries for losses that may result from entry of a new member. Our analysis differs however in that we are concentrating on how the rules of GATT affect the distribution of the gains from expanding membership between the member countries and the acceding countries. In particular, we emphasize the role played by the pattern of trade in such negotiations.

Our work is also related to the literature that models the non-cooperative approach to coalition formation. For example, Seidmann and Winter (1998) and have developed models of the bargaining process for coalition formation, and then analyze the conditions under which such processes will result in

formation of the coalition including all players (eg. global free trade). Our emphasis is slightly different in that our process for adding members to the coalition is intended to capture the GATT rules for accession, including the application of the MFN principle and principal supplier rules to the negotiation process.

Section II of the paper presents a review of the WTO accession process. The purpose of this review is to argue that the WTO accession process can be modeled as a Nash bargaining game between the acceding country and the members, with the threat points in the bargaining game being determined by the previous round of negotiations. Section III analyzes the bargaining game in a 3 country trade model where each country imports one good from the other two countries. This model is useful for analyzing the role of the MFN principle, since countries can potentially discriminate between supplying countries in setting their tariff rates. We show that in this model there is a tendency for member countries to negotiate tariff rates that are too high relative to the efficient tariffs because of the spillover of the benefits of tariff reductions to outside countries. The accession process may favor either the member or acceding countries in this case, depending on the level of transport costs. Transport costs play a significant role because they determine the extent of discrimination that can be practiced against non-members, and hence the extent to which outsiders can free ride on tariff reductions by members. Section IV consider the bargaining game in a 3 country model where each country exports a good to the other two countries. This model is useful for analyzing the principal supplier rule of GATT negotiations, since the tariff reductions that will be negotiated under a trade agreement will only reflect the export interests of the member countries. We show that in this case the agreements between members tend to result in too much liberalization on goods imported from members. The fact that the interests of the acceding country exporters were not reflected in the negotiation will put them at a strategic disadvantage in the accession negotiations.

II. The WTO Accession Process

The basis of the GATT negotiation process is the MFN principle, which requires that a tariff reduction that is negotiated between two member countries be extended to all other members. Thus, one of the benefits to a country from becoming a WTO member is that it receives access to member country markets at MFN rates negotiated in previous negotiating rounds. In addition, the country can have trade disputes with other countries adjudicated under the WTO dispute settlement process and can participate in future rounds of tariff negotiations. Member countries expect that a new entrant will pay for these benefits upon entry by making concessions on its tariffs to member countries. In particular, the extension of concessions to a new entrant may substantially alter the costs of previous concessions, since entry of imports from a new member may reduce profits in politically powerful import-competing producers in member countries. Thus, one goal of the accession process is to ensure that existing members will not be made worse off as a result of the entry of a new member. The purpose of this section is to illustrate how the accession process that has evolved since 1947 deals with theses issues, and to use these rules to suggest a simple bargaining model for analyzing the accession process.

A. The Accession Procedure

The 1947 GATT specified two ways in which a country can become a contracting party. Under Article XXXIII of the GATT Agreement, a party can accede to the agreement on "terms to be agreed between such government and the contracting parties," with decisions of the members being taken by a two thirds majority. The 1947 agreement did not spell out the details of the accession process, so the current accession process used by the WTO is one that has evolved over time in response to applications of member countries. A second route to membership is contained in Article XXVI:5(c), which provides that a territory of a contracting party that attains autonomy can be sponsored for membership by the contracting party. This has been the primary route of entry for newly independent countries. Of the 128 countries that were GATT members in 1995, 64 had succeeded to membership under Article XXVI:5(c)

and 45 had acceded under Article XXXIII.

Our main concern will be the accession process under XXXIII, where entry requires negotiation of new tariff schedules for the entering parties prior to entry. Governments that enter under sponsorship of a member party have typically been covered by existing GATT tariff schedules, so the primary concern in succession is that the governments agree to continue existing commercial policies. The accession process begins with a formal notification by the applicant country that it would like to apply for membership in the WTO. Upon the receipt of this notification, the WTO creates a working party consisting of all interested member countries to consider the application.[2] Recent working parties have averaged 40 members, with a range from 23 (Syechelles) to 68 (China). The applicant then submits a Memorandum on its Foreign Trade Regime that summarizes economic data for the country and provides detailed information on its policies regarding trade in goods, trade-related intellectual property, and trade-related services. This fact-finding period serves to identify the extent to which domestic policies are in conflict with WTO requirements on foreign trade regimes. For example, domestic policies regarding state trading enterprises and agricultural subsidies must be adjusted to conform to WTO rules.

Once the fact-finding stage has progressed sufficiently, the applicant begins bilateral market access negotiations with the members of the working party. The negotiation process typically begins with the applicant offering a Schedule of Concessions and Commitments which indicates the tariff bindings and changes in domestic policy rules that the country is willing to offer to member countries. This schedule then serves as a basis for further negotiations with the member countries, which proceed on a bilateral or plurilateral basis. The negotiations surrounding accession are primarily limited to the trade policy of the acceding country: the tariff rates to be applied by the member countries on trade with each other are fixed at the MFN levels that were negotiated in the most recent round of multilateral negotiations and the accession process typically does not involve a new round of multilateral negotiations. At the conclusion of these negotiations, the working party provides a draft Decision and

Protocol of Accession that lists all of the commitments that have been agreed to by the applicant and the members of the working party. If the Protocol of Accession is approved by a two-thirds majority of WTO members, it then goes into effect 30 days after it is accepted by the applicant.

Although the process only requires a two-thirds approval of member countries, Article XXXV of the GATT gives member countries the right to notify the WTO that it will not apply MFN rates to the acceding country. This effectively requires unanimity on the part of major trading countries with respect to accession, because benefits to an acceding country would be substantially reduced if it did not obtain tariff concessions from a major country. The evolution of Articles XXXIII and XXXV provide some insights about the concerns of the contracting parties regarding accession. The original drafts of the General Agreement called for unanimity on the part of the contracting parties with regard to accession[3]. This was viewed as being too strong because it would give a country a veto over membership, particularly since objections to membership might be on political rather than economic grounds. Therefore, Article XXXIII was amended to require only a two thirds majority. However, it was also felt that a country should not be forced to enter into a trade agreement against its will, so Article XXXV was added giving countries the right to withhold MFN status. The right to withhold MFN status must be taken at the time of accession, however, and cannot be utilized once the two countries have engaged in trade negotiations. [4]

B. A Model of the Accession Process

We will model this process using a three country trade model in which countries 1 and 2 are WTO members and country 3 is an applicant. Let t_{jk}^{i} denote the tariffs imposed by country i on imports of good j from country k and T_k^i the vector of tariffs imposed by country i on imports from k. We can express the preferences of trade negotiators for country i by the function $W^i(T_2^1, T_3^1, T_1^2, T_3^2, T_1^3, T_2^3)$. We will model the multilateral trading negotiations and accession process as a two stage game. In the

first stage the member countries negotiate tariffs $\{\bar{T}_2^1, \bar{T}_1^2\}$ on trade with each other. In the second stage, the members negotiate with the non-member over the remaining tariffs. The MFN and tariff binding features of the WTO are captured by the following constraints that will be imposed on the second stage bargaining: members impose tariffs $\{\bar{T}_2^1, \bar{T}_1^2\}$ negotiated in the first stage on trade with each other and they must offer equivalent concessions (i.e. $t_{i3}^1 = \bar{t}_{i2}^1$ and $t_{i3}^2 = \bar{t}_{i1}^2$) to country 3 if it becomes a member of the agreement. The negotiations in the accession stage will be modeled using the Nash bargaining solution. The threat point in this bargaining game is the payoff that the countries would receive in the absence of a trade agreement, which is the payoff in the game in which the member countries impose tariffs of $\{\bar{T}_2^1, \bar{T}_1^2\}$ on each other and all other tariffs are chosen by countries to maximize their respective national welfare.

Several points should be made regarding our assumptions concerning the bargaining process. First, the Nash bargaining game with transfers will result in an agreement in which the parties split the surplus from the agreement equally, with the surplus from the trade agreement being the difference between the aggregate payoff under the agreement and the aggregate payoff when the trade agreement continues without country 3 as a member. One justification for taking this approach is that it approximates the solution obtained in a three player bargaining game when players can make alternating offers and unanimity is required for an agreement.[5] We view this approach as being consistent with the WTO accession process discussed above, which requires that interested parties be satisfied with the terms being offered by the acceding country before they are proposed for entry to the agreement, since interested parties must be compensated for any losses that might be incurred as a result of entry of a country.[6]

Second, our modeling of tariff instruments in the negotiation process is intended to capture those utilized in the GATT negotiation process. The fact that tariffs among existing members are held fixed indicates that the accession process does not typically involve the opening of a new multilateral

bargaining round, but is primarily concerned with concessions on trade between the acceding country and the members. We view these previously negotiated as being credibly fixed due to the lengthy negotiation process that is typically associated with a tariff round. Also, we assume that there is no coordination by GATT members on their tariffs against non-member countries which seems consistent with the way GATT negotiations proceed.

Finally, it should be noted that we take the fact that country 3 is a non-member in the first stage as exogenously given. Our purpose is not to explain why the process of expansion of the WTO was gradual, since politics and the level of development of the countries seemed to have played a significant role in the timing of their entry.[7] For example, the breakup of the Soviet Union had a significant impact on trade patterns and the desirability of GATT membership for Eastern European countries and the former Soviet Republics, so the decision of these countries to apply for membership in the 1990s rather than the 1950s can hardly be thought to result from a strategic decision about the timing of entry. In light of this assumption, it is not clear that it is appropriate to assume that negotiators in the first stage tariff negotiations take into account the potential entry of the outside country in the second stage. Thus most of our attention will be devoted into the second stage of the game in which the initial trade agreement has already been determined.

III. The Competing Supplier Model

In this section we examine a simple three country model in which each country imports one good from each of the two other countries. This model is useful for analyzing the role played by the MFN principle because a country could choose to discriminate between supplying countries in its choice of tariffs. We begin by deriving the equilibrium of the trade model and the properties of the welfare functions of the respective countries, $W^i(T_2^1, T_3^1, T_1^2, T_3^2, T_1^3, T_2^3)$, and then use these preferences to model the accession game described in the previous section.

We consider a symmetric trade model with three countries and three goods. The demand curve for good j in country i is $D_j^i = A - P_j^i$, where P_j^i is the domestic price of good j in country i. Country i is assumed to have a fixed endowment y of good i and an endowment x (where x > y) of good $j \neq i$. There is a unit transport cost of c between each country for each good. Under these assumptions, all three goods would sell for an export price of A - (2(x-c) + y)/3 in a free trade equilibrium, with country i importing good (x - y - c)/3 units of good i from each of the other countries.

We assume that country i's only trade instrument is an import tariff. Since country i is the only importer of good i and only imposes tariffs on good i, we can drop the country superscript and denote by t_{ij} the specific tariff imposed on imports of good i from country j. If $|t_{ij} - t_{ik}| \leq c$, then commodity arbitrage yields $P_i^j = P_i^i - t_{ij} - c$. This condition can then be substituted into the price conditions to solve for the equilibrium prices and imports by country i from country j, M_{ij},

$$P_i^i = A - \left(\frac{2x + y - \sum_{k \neq i} t_{ik} - 2c}{3} \right) \qquad P_i^j = A - \left(\frac{2x + y + 2t_{ij} - t_{ik} + c}{3} \right) \tag{1}$$

$$M_{ij} = \frac{x - y - 2t_{ij} + t_{ik} - c}{3} \qquad \text{for } |t_{ij} - t_{ik}| \leq c$$

Equation (1) illustrates the transmission of tariff policies between countries when transport costs are significant enough to allow price discrimination. An increase in t_{ij} will improve the terms of trade of countries i and k, but will worsen the terms of trade of country j.

If $|t_{ij} - t_{ik}| > c$, then arbitrage profits exist at the prices (1) because the exporters in the country being discriminated against can earn more by selling to the other exporting country than by selling in i. Letting j be the country against which the high tariff is imposed, arbitrage between the exporting country markets will yield $P_i^k = P_i^i - t_{ik} - c$ and $P_i^j = P_i^k - c$.[8] Solving for equilibrium prices and

import volumes in i yields

$$P_i^{\,i} = \frac{3A-(2x+y)+2t_{ik}+3c}{3}; \quad M_{ik} = \frac{2(x-y)-2t_{ik}-3c}{3}; \quad M_{ij} = 0 \qquad \text{for } t_{ij} - t_{ik} > c \qquad \textbf{(2)}$$

In this case an increase t_{ik} will reduce imports of good i from country k, and will depress the price of good i in countries j and k. Note that if $t_{ij} - t_{ik} = c$, exporters in j are indifferent between selling in i and selling in k. To simplify the following discussion, we will assume that in the event of such indifference the goods are sold in country i (which minimizes world transport costs).

It will be assumed that the trade negotiators choose tariffs to maximize a weighted social welfare function. Tariff revenue, consumer welfare, and producer welfare in the export sectors all receive equal weight (normalized to 1), while producers in the import-competing sector receive a weight of $\alpha \geq 1$. Under this assumption, the welfare in the import-competing sector will be the sum of consumer surplus, tariff revenue, and weighted producer surplus.

$$S_i^{\,i}(T_i) = \frac{1}{2}\left(A-P_i^{\,i}\right)^2 + \sum_{j\neq i} t_{ij}M_{ij} + \alpha P_i^{\,i} y \qquad \textbf{(3)}$$

Welfare of country i in its exportable sector j is the sum of consumer and producer surplus

$$S_j^{\,i}(T_j) = \frac{1}{2}\left(A-P_j^{\,i}\right)^2 + P_j^{\,i} x \qquad \textbf{(4)}$$

The welfare function will then be the sum of the sectoral payoffs, $W^{\,i}(T_1,T_2,T_3) = \sum_{k=1}^{3} S_k^{\,i}(T_k)$. This weighted social welfare function is intended to capture the idea that organized sector specific interests are able to exert influence on politicians and thus obtain policies that are favorable to their interest at the expense of consumer groups that are not organized. For example, the Grossman and Helpman (1995)

model would generate such an objective function.

In the absence of a trade agreement, the optimal tariff policy for country i is obtained by choosing t_{ij} to maximize (3). It is straightforward to show that due to the symmetry between the countries, the optimal tariff policy will have equal tariffs on imports from all partners at a value given by

$$t^N = \frac{x + (3\alpha - 4)y - c}{4} \qquad \text{for } \alpha < \frac{x - c}{y} \qquad \textbf{(5)}$$

The restriction on the weight on import-competing producers, which will be maintained throughout the analysis, ensures that the optimal equilibrium tariff is not prohibitive. Due to the separability of markets and the endowment pattern, the optimal trade policy of country i is independent of tariffs set by other countries and (5) will be the tariffs in the non-cooperative Nash equilibrium.

The welfare functions W^i reflect the standard prisoner's dilemma problem of trade policy, since all countries would gain by multilateral tariff reductions in the neighborhood of the Nash equilibrium tariff. If countries can commit to tariff rates in negotiations, then the multilateral tariff negotiations involving all three countries can be modeled as a Nash bargaining problem in which the threat point of each country is its Nash equilibrium payoff. Due to the symmetry of the countries, the solution to this problem is the tariff that maximizes $\sum_{i=1}^{3} W^i(T_1,T_2,T_3)$. Differentiating (3) yields the effect of an increase in t_{ij} on the welfare of the importing country,

$$\partial W^i/\partial t_{ij} = M_{ij}(1 - \partial P_i^i/\partial t_{ij}) - M_{ik}(\partial P_i^i/\partial t_{ij}) + \sum_{l=j,k} t_{il}(\partial M_{il}/\partial t_{ij}) + (\alpha - 1)y(\partial P_i^i/\partial t_{ij}).$$

The first two terms reflect the terms of trade effect of a discriminatory tariff change, the third term is the trade volume effect, and the final term is the political economy effect. From (4), the effect of the tariff on the exporting countries is $\partial W^k/\partial t_{ij} = M_{ik}(\partial P_i^k/\partial t_{ij})$, which reflects the effect of the tariff of country k's terms of trade. Combining these terms, the tariff levels that maximize world welfare will be

$$t^C = (\alpha - 1)y \qquad \textbf{(6)}$$

This will yield a free trade outcome in the case where import-competing producers receive equal weight with other interest groups in the national objective function. However, when $\alpha > 1$ the efficient tariffs in multilateral negotiations will be positive because of the desire of policymakers to protect domestic producers.

A. Accession Negotiations

We begin the analysis by considering the stage 2 accession game, given the tariffs negotiated by countries 1 and 2 in stage 1. In light of the symmetry in endowments across the three countries, we can restrict attention to the case in which the initial trade agreement specifies $\bar{t}_{12} = \bar{t}_{21}$. We denote this tariff imposed on trade between member countries in goods 1 and 2 as t^m. The MFN principle will ensure that if an agreement is reached, $t_{13} = t_{23} = t^m$. Similarly, country 3 must apply the same tariffs to imports from countries 1 and 2 if it becomes a member, so the tariff negotiated between 3 and the members can be denoted $t^a = t_{31} = t_{32}$. The negotiations in this accession will involve offers of tariff reductions by the acceding country in return for receiving MFN access to the member markets.

The payoff to a member country under an agreement can thus be expressed as $W^m(t^m, t^a) = W^1(t^m, t^m, t^m, t^m, t^a, t^a)$, and the payoff to the acceding country is $W^a(t^m, t^a) = W^3(t^m, t^m, t^m, t^m, t^a, t^a)$. Utilizing (1), (3), and (4) yields the following results:

Lemma 1: *For values of t^m and t^a that are not prohibitive,*

(a) The payoff to the representative member country, $W^m(t^m, t^a)$,

(i) is concave in t^m and attains a maximum at $\tilde{t}^m = (x + (6\alpha - 7)y - c)/7$, where $t^N > \tilde{t}^m > t^C$

(ii) is convex and decreasing in t^a

(b) The payoff to the acceding country, $W^a(t^m, t^a)$,

(i) is concave in t^a and achieves a maximum at $t^a = t^N$

(ii) is convex and decreasing in t^m for tariffs that are not prohibitive

Note that for the existing members of the agreement, the tariff that maximizes member welfare is less than the Nash value. Specifically, for country 1 the Nash tariff satisfies $\partial S_1^1(t^N, t^N)/\partial t_{1j} = 0$ for j = 2,3. In contrast, $\partial W^m/\partial t^m = \sum_{j=2,3} \partial S_1^1(t^m, t^m)/\partial t_{1j} + \sum_{j\in\{1,3\}} \partial S_2^1(t^m, t^m)/\partial t_{2j}$, where the second term reflects the effect on country 1 of an increased tariff on its exports to the partner country's market and must be negative. Therefore, the optimal value of t^m will be less than the Nash tariff. Reductions in t^m reflect reciprocal tariff reductions by members, so each of the original members benefits from reductions in the other's tariffs. Note however that the optimal tariff for the members will exceed the cooperative level defined in (4) because members do not internalize the benefits of tariff reductions on the non-member.

In the event that 3 does not become a member, country 3 will impose its optimal tariff on imports from both 1 and 2, which yields $t_{3i} = t^N$ for i = 1,2. The member countries will impose t^m on imports from the other member and will individually choose their optimal tariffs on imports from the non-member. The following result, which is proven in the Appendix, characterizes the optimal tariff imposed by the member country.

Lemma 2: *If $t^m < t^N$, the optimal tariff by a member country against the non-member is*

$$\tilde{t}(t^m) = \min \left[\frac{7t^m + x - c + (3\alpha - 4)y}{11},\ t^m + c \right] \qquad \textbf{(7)}$$

where $\tilde{t}(t^m) > t^m$ for $c > 0$.

This result shows that the member will choose to discriminate against the non-members in the absence of an agreement, although the extent of the discrimination is limited by the possibility of arbitrage. The result is illustrated in Figure 1, which shows $S_1^1(t^m, t_{13})$ for a case in which the arbitrage places a binding

constraint on the level of discrimination. $S_1^1(t^m, t_{13})$ has discontinuities at $t^m - c$ and $t^m + c$. For values outside this interval, all imports come from the favored country and the disfavored country ships its exports to the favored country. The discontinuity occurs because this transshipment is costly and uses up resources that would otherwise be tariff revenue for 1. Using (7), it can be seen that the arbitrage condition will be binding (i.e. $\tilde{t}(t^m) = t^m + c$) if the transport cost is less then the critical value c^*, where

$$c^*(t^m) = \frac{x + (3\alpha - 4)y - 4t^m}{12} \qquad \textbf{(8)}$$

Note that c^* is decreasing in t^m, with $c^*(t^N) = 0$.

In the absence of an accession agreement, the payoff to each country will be the payoff obtained when the existing trade agreement on t^m applies only between countries 1 and 2. This yields payoffs $W_D^m(t^m) = W^1(t^m, \tilde{t}(t^m), t^m, \tilde{t}(t^m), t^N, t^N)$ to the member countries and $W_D^a(t^m) = W^3(t^m, \tilde{t}(t^m), t^m, \tilde{t}(t^m), t^N, t^N)$ to the outside country. Using (1) to (4) we obtain the following characteristics of these welfare functions:

Lemma 3: *For values of $t^m < t^N$,*

(a) If $c > c^*(t^m)$, $W_D^m(t^m)$ is concave with $\frac{\partial W_D^m}{\partial t^m} = \frac{2x + (61\alpha - 63)y - 63t^m - 2c}{121}$. *$W_D^m$ attains a maximum at $\tilde{t}_D^m = (2(x-c) + (61\alpha - 63)y)/63$, where $\tilde{t}_D^m \in (t^C, t^N)$. $W_D^a(t^m)$ is convex with*

$$\frac{\partial W_D^a}{\partial t^m} = \frac{2(-3x + (2\alpha + 1)y + t^m + 3c)}{121} < 0 \text{ for } t^m \in [t^C, t^N].$$

(b) If $c < c^*(t^m)$, $W_D^m(t^m)$ is concave with $\frac{\partial W_D^m}{\partial t^m} = \frac{x + (6\alpha - 7)y - 7t^m - 6c}{9}$. *$W_D^m$ attains a maximum at $\hat{t}_D^m = (x + (6\alpha - 7)y - 6c)/7$. $W_D^a(t^m)$ is convex with* $\frac{\partial W_D^a}{\partial t^m} = \frac{2(y - x + t^m + 3c)}{9} < 0$ *for $t^m \in [t^C, t^N]$.*

These results show how the effect of preferential tariff reductions depends on the level of transport costs.

First consider the case where the arbitrage condition is not binding at t^m. By part (a) it can be seen that a tariff reduction of this type will benefit non-members for all initial tariffs not less than the efficient tariff, whereas members will benefit for all tariff reductions in the interval $(\tilde{t}_D^{\,m}, t^N]$. Tariff reductions will be less attractive for members if the arbitrage constraint is binding, since concessions to members result in equivalent concessions to non-members. If c = 0, it follows from (b) that tariff reductions will be welfare reducing for the member countries in the interval $[t^C, \hat{t}_D^{\,m}]$ and welfare enhancing for the non-members for all $t^m < t^N$.

The payoff functions described in Lemmas 2 and 3 can now be used to illustrate how the value of t^m affects the accession payoff. Let Z_i denote the transfer paid by the acceding country to country i, which can take on negative values if the members must pay to obtain tariff concessions from the outsider. We will assume that each country receives equal weight in the bargaining solution, so that we can let Z denote the transfer to the representative member country. The Nash bargaining solution to the accession game will be the values of t^a and Z that solving the following optimization problem:

$$\max_{Z,t^a} \quad \left(W^a(t^m,t^a) - W_D^a(t^m) - 2Z\right)\left(W^m(t^m,t^a) - W_D^m(t^m) + Z\right)^2 \qquad \textbf{(9)}$$

It is well known that the solution to this problem with transfers between players will involve the choice of t^a to maximize the total payoff, $W^W(t^m,t^a) \equiv W^a(t^a,t^m) + 2W^m(t^a,t^m)$. Lemma 1 can be used to show that W^W is maximized at $t^a = t^C$. The transfer level equates the surplus to the member and non-members and will be $Z = (1/3)\left[\left(W^a(t^m,t^a) - W_D^a(t^m)\right) - \left(W^m(t^m,t^a) - W_D^m(t^m)\right)\right]$. The payoff to the member country under the agreement will then be

$$V^m(t^m) = W^m(t^m,t^a) + Z = (1/3)\left[W^W(t^m,t^C) + W_D^m(t^m) - W_D^a(t^m)\right] \qquad \textbf{(10)}$$

(9) can be used to illustrate how the terms of the initial trade agreement affect the payoff to the member countries in the second stage bargaining game.

The effect of changes in t^m on the member payoff can be divided into two components: the efficiency (i.e. world welfare) effect and the bargaining strength effect, $W_D^m(t^m) - W_D^a(t^m)$. This is illustrated in Figure 2. The line AB denotes the potential divisions of world welfare $W^W(t^m,t^c)$ among the acceding country and a representative member for a given value of t^m. Reductions in t^m will shift this frontier outward for $t^m > t^C$. For a given value of t^m solution to the bargaining problem will be the point on the payoff frontier that lies on a line with slope of 1 through the threat point, since this reflects an equal split of the gains from the agreement among the three countries. The point N denotes the payoff to the respective countries in the Nash equilibrium where all countries impose t^N, which will be the payoff of the countries if the members have made no reductions among themselves (i.e. $t^m = t^N$).

We first consider how the threat points are affected by reductions in t^m in the case where the arbitrage constraint is not binding, the results of Lemma 3 can be used to show that $\left(\partial W_D^m/\partial t^m\right) - \left(\partial W_D^a/\partial t^m\right) < 0$ when evaluated at $t^m = t^N$. This means that the threat point will move along the locus NE in Figure 2, with point E corresponding to the value $\tilde{t}_D^m$ from Lemma 3 at which the member's threat point payoff is maximized. This illustrates how tariff reductions serve to shift bargaining power in favor of the members if transport costs are sufficiently high. If we start with an agreement with $t^m = t^C$, it can be shown that the transfer that solves the bargaining problem will be positive. This is another sense in which the existing agreement shifts bargaining power to the member country, since without a pre-existing agreeement the negotiation would result in a tariff of t^C for all countries with a zero transfer. The value of t^m that maximizes the payoff to the member in the accession game can be obtained by maximizing (10). Since W^W is concave in t^m and is maximized at t^C and the difference in threat points is maximized at a value of t^m exceeding $\tilde{t}_D^m > t^C$, the payoff to the members will be maximized if they engage in less than the socially optimal amount of tariff reduction in the first

stage bargaining.

In contrast, the outside country is in a better position of the arbitrage constaint is binding. Suppose that we consider the case of c = 0, in which any tariff reductions by members are automatically extended to the non-member country because price discrimination against the outside country cannot be supported. With c = 0, it follows from Lemma 3 that the payoff to the members will increase with reductions in t^m and the payoff to the acceding country will rise with reductions in t^m. The threat point will move along the locus NF in Figure 2 in this case. It can be shown by that in this case the tariff that maximizes the difference in threat points is $t^m = (x + (2\alpha - 3)y)/3 > \hat{t}_D^m > t^C$.. Again, the members impose a tariff on each other higher than the socially optimal level in the first stage.

These results can be summarized as:

Proposition 1: *The solution to the bargaining problem (9) yields*

(a) The tariff of the acceding country will be at the efficient level, $t^a = (\alpha\text{-}1)y$.

(b) If the arbitrage constraint is not binding, the payoff to members (10) will be maximized at a value of $t^m > t^C$ which will leave members better off relative to the outsider. Members must also be better off at $t^m = t^C$.

(c) If the arbitrage constraint is binding, the payoff to members will be maximized at a value $t^m > t^C$ which will be less than that to non-members if transport costs are sufficiently low.

We conclude the analysis of this case with a brief discussion of the first stage negotiations problem between the members when country 3 is not a member of the agreement. In the first period there is no possibility of an agreement with the outside country by assumption. Assuming that the endowment and preference parameters are the same in the first and second stages, the first stage the payoff to members is $W_D^m(t^m)$. If member countries are not forward looking, they would choose the tariffs $\tilde{t}_D^m$ ($\hat{t}_D^m$) as given by Lemma 3 when the arbitrage constraint is not (is) binding. If members are forward

looking and anticipate negotiations with the outside country in the first stage, they would choose the initial tariff t^m to maximize $W_D^m(t^m) + \delta V(t^m)$, where δ is the discount rate attached to the second stage payoffs. This would result in the choice of tariff that exceeded $\tilde{t}_D^m$. In the case where the arbitrage conditions are binding, the incentive to engage in first stage negotiations are weaker. In particular, with c = 0 the first stage payoff of members is maximized at $\hat{t}_D^m = (x + (6\alpha-7)y)/7$, where $\hat{t}_D^m \in (t^C, t^N)$.

IV. The Principal Supplier Model

In this section we examine a variation of the model in the previous section to consider the case in which the endowment pattern is such that country i has an endowment of x of good i and y of good $j \neq i$, where x > y. The demand curves are assumed to be identical to those in the previous section, so that in the free trade equilibrium the price in each country will be A - (x + 2y)/3 and country i will import (x-y)/3 of goods $j \neq i$. Since good i is being imported by countries $j \neq i$, we can simplify our tariff notation by letting t_i^j denote the tariff imposed by country j on imports of good i. Since there is only one supplier of a good in each market, the MFN principle will not play a role in this model and we will set transport costs to 0.

Letting P_i^j denote the price of good i in country j, commodity arbitrage for this trade pattern will ensure that $P_i^j = P_i^i + t_i^j$. This yields the following equilibrium price and imports of good i by country j, M_i^j

$$P_i^i = A - \frac{x+2y+\sum_{j\neq i} t_i^j}{3}; \quad P_i^j = A - \frac{x+2y-2t_i^j+t_i^k}{3}; \quad M_i^j = \frac{x-y-2t_i^j+t_i^k}{3} \qquad \textbf{(11)}$$

An increase in t_i^j will worsen the terms of trade of the exporting country i and will result in a shift of sales by country i from country j to the other importing country. As in the previous section, we assume

that welfare in an import-competing sector can be written as the sum of consumer surplus, tariff revenue, and weighted producer surplus. This yields

$$S_j^i(t_j^i, t_j^k) = \frac{1}{2}\left(A - P_j^i\right)^2 + t_j^i M_j^i + \alpha P_j^i y \qquad \textbf{(12)}$$

Welfare of country i in its exportable sector i is the sum of consumer and producer surplus,

$$S_i^i(t_i^j, t_i^k) = \frac{1}{2}\left(A - P_i^i\right)^2 + P_i^i x \qquad \textbf{(13)}$$

National welfare can then be written as the sum of sectoral surpluses, $W^i = S_i^i(t_i^j, t_i^k) + S_j^i(t_j^i, t_j^k) + S_k^i(t_k^i, t_k^j)$.

As in the previous model, an importing country will impose tariffs for two reasons: to transfer income to producers in the importing sectors and to obtain improved terms of trade on importables. The optimal tariff for country i on good j, given the trade policy of country other importing countries, is obtained by solving $\partial S_j^i(t_j^i, t_j^k)/\partial t_j^i$ using (11) and (12) to obtain

$$\hat{t}_j^i(t_j^k) = \frac{x + (6\alpha - 7)y + t_j^k}{8} \qquad \textbf{(14)}$$

Tariffs will be higher the greater is the political power of the import competing producers, and the greater the degree of comparative advantage of the exporting country, x, and the greater the tariff imposed by the other importing country, t_j^k. The latter result follows because an increase in the tariff by the other country results in a rise in the volume of exports to the i market, lowering the elasticity of export supply and raising the optimal tariff. This creates a strategic interaction between country policies in this model.

The Nash equilibrium tariffs in the case without trade agreements can be solved from (14) to be

$$t^N = \frac{x+(6\alpha-7)y}{7}$$

Mutual tariff reductions from the Nash equilibrium will be welfare improving, and the tariffs that maximize world welfare will be given by t^C as in the previous section.

We assume an initial agreement in place between countries 1 and 2 that specifies the tariff each will impose on the other's export good. We denote this tariff, which is assumed to be the same for each country from our symmetry assumption, by $t_m^m = t_1^2 = t_2^1$. These tariff negotiations would not however have specified a reduction in the tariff imposed on good 3, for which the non-member country is the principal supplier, because it is not in the interest of either member to engage in tariff reductions on this good.[9] Negotiations between the member countries and the non-member will be over the tariff to be applied by members on the non-member good, denoted $t_a^m = t_3^1 = t_3^2$, and the tariff imposed by the non-member on exports from the members, $t_m^a = t_1^3 = t_2^3$.

The welfare of a representative member country over these tariff rates can be expressed as $W^m(t_m^m, t_a^m, t_m^a) = W^1(t_m^m, t_a^m, t_m^m, t_a^m, t_m^a, t_m^a)$, and the payoff to the acceding country is $W^a(t_m^m, t_a^m, t_m^a) = W^3(t_m^m, t_a^m, t_m^m, t_a^m, t_m^a, t_m^a)$. The following results characterize the properties of the respective welfare functions with respect to these tariffs:

Lemma 4*: The welfare functions have the properties:*

(a) $W^m(t_m^m, t_a^m, t_m^a)$ *is concave in* t_m^m *and* t_a^m*, and convex and decreasing in* t_m^a.

(b) $W^a(t_m^m, t_a^m, t_m^a)$ *is concave in* t_m^a *and* convex in t_m^m *and* t_a^m.

(c) Given t_m^m, $W^W(t_m^m, t_a^m, t_m^a) = W^a(t_m^m, t_a^m, t_m^a) + 2W^m(t_m^m, t_a^m, t_m^a)$ is maximized by choosing

$t_a^m = t^C$ *and* $t_m^a = (t_m^m + t^C)/2$.

Parts (a) and (b) reflect the existence of mutually beneficial tariff reductions. Part (c) is useful in characterizing the tariffs that will be negotiated as part of the accession agreement, since our assumption

on the bargaining process ensures that the negotiated tariffs maximize world welfare as noted above. The tariff negotiated on non-member exports to the members will be the efficient tariffs that would have been chosen if there were no initial agreement in place. However, the tariffs imposed by the non-member on exports from members will only be efficient if the members are already imposing efficient tariffs on each other. This potential inefficiency arises because of the spillover between tariffs of members and non-members on member country goods.

In the absence of an agreement between the members and the non-member, there will be no agreement on good 3 tariffs so they will be at their Nash equilibrium levels. In the markets for goods 1 and 2, the outside country imposes its optimal tariff, $\hat{t}(t_m^m)$ while the members impose the agreement tariff. The payoff to the member in the absence of an agreement will be $W_D^m(t_m^m) = W^1(t_m^m, t^N, t_m^m, t^N, \hat{t}(t_m^m), \hat{t}(t_m^m))$, and the payoff to the non-member is $W_D^a(t^m) = W^3(t_m^m, t^N, t_m^m, t^N, \hat{t}(t_m^m), \hat{t}(t_m^m))$

Lemma 5 *:For the case of specialized export suppliers, the disagreement payoffs have the properties:*

(a) $W_D^m(t_m^m)$ *is concave in* t_m^m *, with* $\dfrac{\partial W_D^m(t_m^m)}{\partial t_m^m} = \dfrac{-23t_m^m - 3x + (26\alpha - 23)y}{32} < 0$ *for* $t_m^m > t^c$.

(b) $W_D^a(t_m^m)$ *is concave in* t_m^m*, with* $\dfrac{\partial W_D^a(t_m^m)}{\partial t_m^m} = \dfrac{-55t_m^m + 9x + (46\alpha - 55)y}{32} > 0$ for $t_m^m < t^N$

The results of Lemma suggest strong strategic effects of the initial agreement, since tariff reductions make the threat point of the member country better and the threat point of the outsider worse. This will lead to an unambiguous improvement in the bargaining position of the member countries.

The payoffs to the member in the second stage accession game are given by

$$V^m(t_m^m) = (1/3)\left[W^W(t_m^m, t^C, t_m^a) + W_D^m(t_m^m) - W_D^a(t_m^m)\right] \qquad \textbf{(16)}$$

It follows from Lemma 5 that $W_D^m(t_m^m) - W_D^a(t_m^m)$ is decreasing in t_m^m for $t_m^m \in [t^C, t^N]$. Therefore, the optimal value of t_m^m for the members will be less than the level that maximizes world welfare, t^C.

Note that in this case the incentives of the members are to cut the tariff on member goods below the multilaterally optimal level, because reduced tariffs among the member countries tend to reduce the payoff to the outside countries under the agreement. This contrasts with the outcome in the previous section, where bargaining power was enhanced by making tariff reductions that were smaller than the multilaterally optimal level.

V. Conclusions

This paper has shown how the MFN principle and the principal supplier rule for tariff negotiations affect the payoffs to members relative to non-members in the accession game. The results show that when transportation costs are sufficiently low, receiving MFN treatment has relatively little value for outsiders because the potential for discrimination against non-members is too low. When discrimination is possible, the amount of tariff reduction by members will tend to be less than that obtained in the socially optimal agreement. It was shown that bargaining power was in favor of the member countries when the arbitrage condition was binding, but could shift against members in cases where it was not binding. The low value of MFN treatment for member countries in some cases may indicate why countries are occasionally willing to extend it to non-member countries prior to their accession.

On the other hand, the principal supplier rule conveys considerable power to member countries because of its influence over the pattern of tariff reductions. For example, GATT historically was very slow to liberalize trade in textiles. This seemed to have reflected the fact that the GATT consisted primarily of more developed countries, so that principal suppliers of these goods were not members of the agreements. In this case, the primary benefit of entry for outside countries is the ability to influence

the course of future negotiations.

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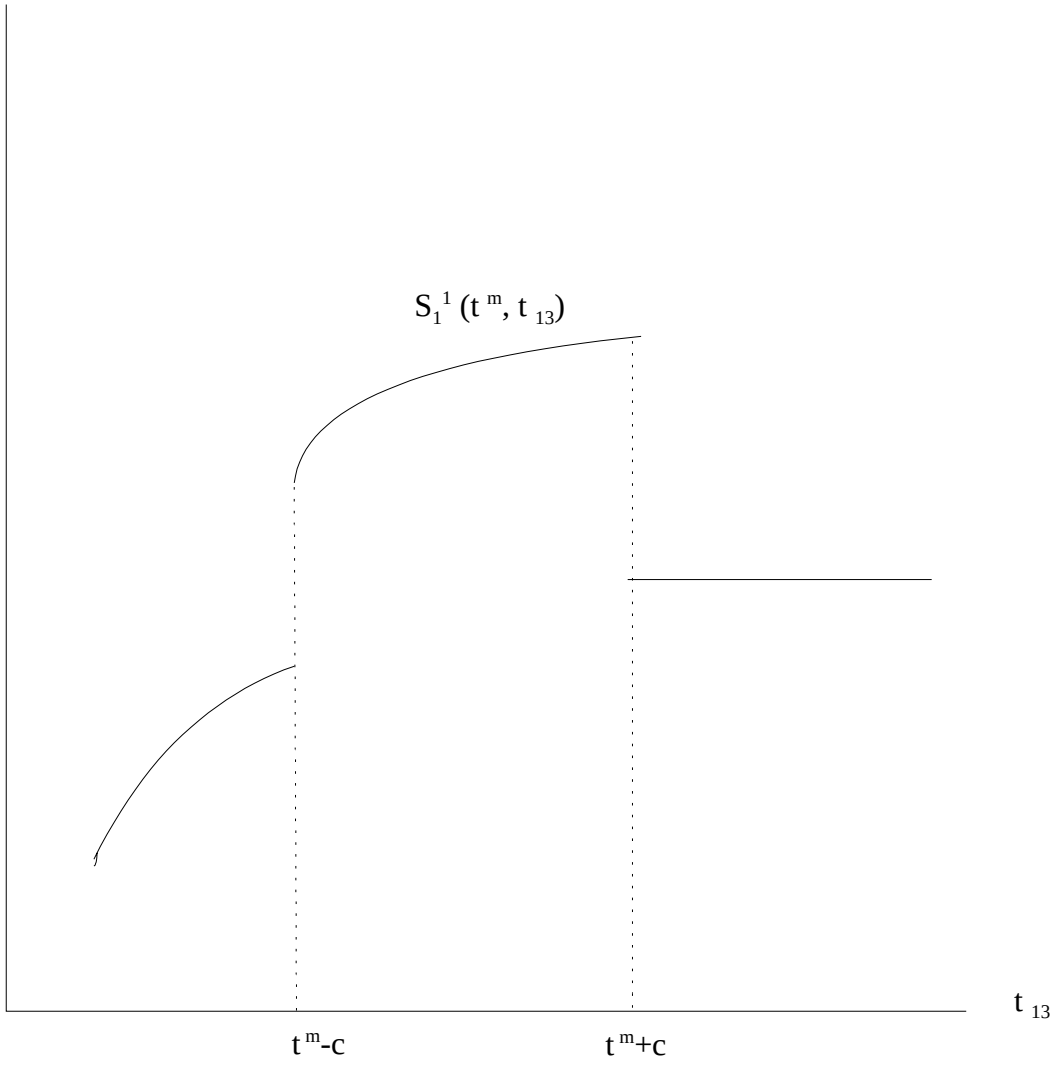

Figure 1

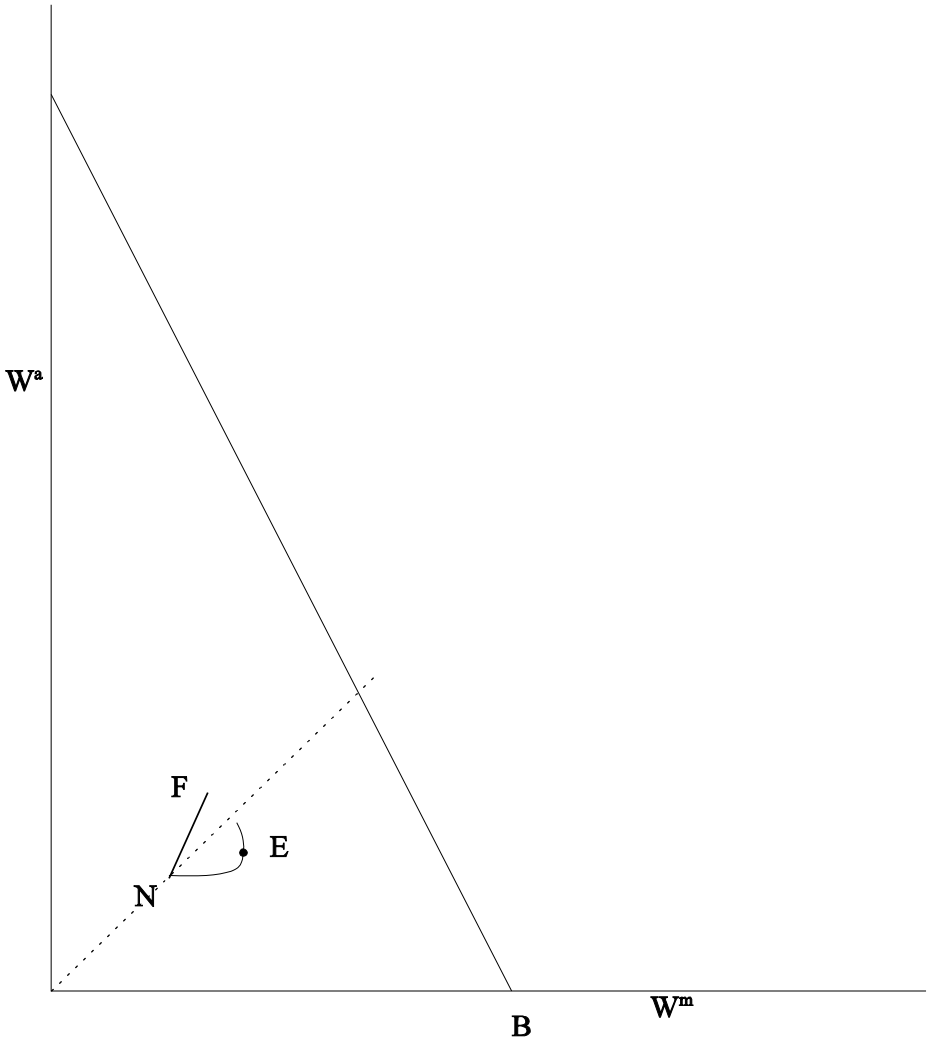

Figure 2 Bargaining Problem with Competing Suppliers

Appendix

Proof of Lemma 2: Consider the choice of t_{13} for country 1 with $t_{12} = t^m$. We first show that 1 will never choose $t_{13} < t^m - c$. For values of t_{13} in this region, country 1 imports from the non-member only and its domestic price and import level is given by (2). Substituting these values in (3) yields

$$\frac{\partial S_1^1(t^m, t_{13})}{\partial t_{13}} = \frac{1}{9}\left[2x + (6\alpha - 8)y - 3c - 8t_{13}\right] \qquad \text{for } t_{13} < t^m - c$$

It can be seen from (A.1) that $S_1^1(t^m, t_{13})$ is concave for $t_{13} < t^m - c$. Also, $t^m < t^N$ is sufficient for (A.1) to be positive on $[0, t^m - c)$. At $t_{13} = t^m - c$, 2 is indifferent between exporting to 1 and 3, so any non-negative import values such that $M_{12} + M_{13} = [2(x - y) - 2t^m - c]/3$ are possible. Since imports from 2 yield higher tariff revenue per unit these import levels are not welfare equivalent, and the highest welfare level for $t_{13} = t^m - c$ is attained where $M_{13} = 0$. Under our assumption that imports come from the highest revenue source when suppliers are indifferent, the welfare in this region takes an upward jump as illustrated by point A in Figure 1.

A similar argument can be used to rule out an optimum for $t_{13} > t^m + c$. At $t_{13} = t^m$, country 3 suppliers are indifferent between selling to 1 or 2 and imports can take on any values such that $M_{12} + M_{13} = [2(x - y) - 2t^m - 3c]/3$. Since imports from 3 have a higher tariff at this point, the highest welfare occurs where $M_{12} = 0$. For any $t_{13} > t^m - c$, we have $M_{12} = [2(x - y) - 2t^m - 3c]/3$ and $M_{13} = 0$. Therefore, welfare takes a downward jump at this point as illustrated by point B in Figure 2.

For $t_{13} \in [t^m - c, t^m + c]$ import levels M_{1j} for $j = 1,2$ are given by (1). Substituting these into (3) yields

$$\frac{\partial S_1^1(t^m, t_{13})}{\partial t_{13}} = \frac{1}{9}\left[x + (3\alpha - 4)y - c + 7t^m - 11t_{13}\right] \qquad \text{for } t_{13} \in (t^m - c, t^m + c)$$

Welfare is concave in t_{13} in this region, with (A.1) positive when evaluated at $t_{13} = t^m$ for $t^m < t^N$. Therefore, the optimal discriminatory tariff must be contained in $(t^m, t^m + c]$. If the solution is interior, its value is solved by setting (A.2) equal to zero, which yields $t_{13} = [x + (3\alpha\text{-}4) - c + 7\,t^m]/11$. If this value exceeds $t^m + c$, then $S_1^1(t^m, t_{13})$ is maximized at $t_{13} = t^m + c$, which yields (7). ||

Endnotes

1.This extends ideas developed in their (1999a) paper, which argues that the rules of GATT are an attempt to obtain efficient trade agreements between governments that have politically weighted objective functions.

2. The details in this section are drawn from WTO (1995a), which summarizes the formal procedures of the WTO accession process and WTO (1999), which summarizes the outcome of recent WTO accessions and the status of current applications.

3. For example, the initial application of this Article was between initial contracting parties to the GATT because India wanted to impose an economic boycott of South Africa and did not want to enter into trade negotiations with that country.

4. The only one case in which Article XXXV has been invoked by a significant number of countries against a new member occurred in the accession of Japan in 1955. Although Japan received the required unanimous agreement on entry, 14 countries (accounting for 40% of Japan's export sales) invoked Article XXXV against Japan. One of the major issues was the concern that Japan's low wage textile industries might wipe out existing textile producers in many higher wage member countries. By the mid 1960s, most of the major countries had extended MFN status to Japan. This followed bilateral negotiations between the countries and also the formation of a GATT agreement on trade in cotton textiles.

5. Osborne and Rubinstein (1990) show that if attention is limited to stationary strategies, the unique subgame perfect equilibrium in this bargaining game is for players to receive shares of the surplus given by $(\xi, \xi\delta, \xi\delta^2)$, where $\delta < 1$ is the discount parameter and ξ is chosen such that the shares sum to 1. The size of shares is determined by the order of moves in the bargaining game.

6. The difficulties associated with Japan's entry (noted in footnote) could be interpreted as reflecting the difficulties associated with finding such compensation when explicit cash transfers are not being used. Patterson (1966, p. 280) describes the reasons for opposition to Japan's entry as being based on the fact that since previous tariff reductions were negotiated when it had not been anticipated that Japan would enter, it was not clear whether equivalent concessions could be found for some of the member countries that would allow the member countries to sustain previous tariff reductions. In fact, the U.S. (a major supporter of Japan's entry) offered concessions to third countries to encourage them to support Japan's accession.

7. In contrast, Seidman and Winter (1999) analyze a coalition formation game in which countries make offers that specify the membership and payoffs to members of the coalition. This sequential game allows for interim coalitions, so that whether coalitions form gradually or immediately is endogenously determined. Our formulation differs in two important ways. First, they assume that while interim coalitions can affect the distribution of payoffs among coalitions, these interim coalitions cannot affect the aggregate payoff. In our analysis, the tariff bindings in the first stage will affect the final agreement. Second, they allow for all players to be negotiating in the first stage, while we impose the requirement that only countries 1 and 2 can negotiate at

the first stage.

8.Since country k is now an importer of good i it could impose a tariff on imports from j. However, we will show below that such a situation would not arise in equilibrium, so we will not introduce the additional notation required to allow for this possibility.

9.In fact, it would be in the interest of members to negotiate an increase in this tariff, since by coordinating their market power they could impose an optimal external tariff against the non-member country. We assume that such coordination does not take place, since it does not seem to be consistent with the GATT negotiations and the principal supplier rule.