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*Generalized versus Preferential Tariff Reduction: A Note on the Welfare Implications***

In general, two divergent approaches seem to prevail in the debate about the impact of developed countries' agricultural trade policies on less developed countries. According to one, the existence of trade barriers is definitely harmful for less developed countries' economies, and a *generalized* reduction of the level of protection of developed countries' agricultural sectors is promoted as a powerful tool capable of stimulating less developed countries' exports. Supporters of this approach in developed countries are, in large part, traditional exporters of agricultural products. The United States' position before the United Nations Conference on Trade and Development (reluctant about the implementation of a preferential import tariff reduction for less developed countries' exports) and in the General Agreement on Tariffs and Trade meetings (in support of an extension of the Most Favoured Nation principle to a much larger set of agricultural commodities) may be seen as representative of this first approach. The same position has been taken very firmly by the World Bank (1986).

A second alternative view does not see protectionist agricultural policies as necessarily harmful to less developed countries. A *preferential* tariff reduction – one that increases market access for less developed countries' exports without reducing the nominal level of the barriers faced by other developed countries' exports – is suggested as an effective instrument to increase less developed countries' exports. Among developed countries, this approach has in general been embraced by the traditional importers of agricultural commodities. The European Community is probably the most representative supporter of this point of view. Its approach in the United Nations Conference on Trade and Development has been opposite to that of the United States. The European Community has shown a relative openness (with an eye, of course, to the interests of its domestic producers) toward the Generalized System of Preferences principle.

In both cases it seems that developed countries tend to argue that the trade policy scenarios which are optimal for less developed countries are those that they perceive as desirable for themselves.

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This paper presents the main results of a comparative evaluation, on theoretical grounds, of the welfare effects of a preferential tariff reduction for agricultural exports from less developed countries versus the effects of a generalized tariff reduction. From a methodological point of view, the main original feature of the paper is that in the model used for the analysis, countries' positions on the world market are not set *a priori*. Instead, countries are allowed to switch from one side of the market to the other as the price changes.

It will be shown that: (a) a developed importing country willing to help less developed countries' growth is *always* better off by doing so through a preferential tariff reduction than through a generalized tariff reduction; (b) a developed exporting country is *always* better off if the developed country that is importing uniformly lowers its tariff rather than if a preferential tariff reduction takes place; and (c) a developing country which is the recipient of the preferential tariff is *always* better off under a preferential tariff reduction than under a generalized tariff reduction. In addition, some other interesting results are discussed, such as the possible existence of multiple feasible equilibrium solutions, and the paradoxical case of an exporter made better off by the imposition of a tariff by an importer.

THE BASIC MODEL

The analysis is based on a one-commodity, three-large-countries world model. All the results are derived in a partial equilibrium framework. In addition, a fixed exchange rate, zero transportation costs, linear demand and supply curves and perfect competition on both the domestic and the world markets are assumed.

Throughout the paper, country A is the developed importing country the effects of whose alternative trade policy choices on the market equilibrium are to be evaluated. These policy options are: (i) the imposition of a non-discriminatory import tariff (NDT), (ii) the implementation of a preferential trade policy by granting free access to the imports from a preferred country, leaving a (discriminatory) tariff (DT) on the imports from a third, non-preferred, country; and (iii) complete trade liberalization (FT). Country C will be granted preferential treatment, while country B will be the non-preferred country.

In making its trade policy choice, country A is assumed to be maximizing a welfare function (W_a) whose arguments are its 'market specific social welfare' ($MSSW_a$, defined as the sum of the producers' and consumers' surplus (CPS) and of the tariff revenue (TR), assumed to be redistributed to producers and consumers as a lump sum transfer), and countries B (W_b) and C's (W_c) welfares which are defined as the sum of their producers' and consumers' surplus:

$$W_a = W_a(MSSW_a, W_b, W_c)^1; \quad (1)$$

$$W_b = CPS_b; \quad (2)$$

$$W_c = CPS_c. \quad (3)$$

Furthermore, it is assumed that country A's behaviour is *always* such that its welfare function is maximized, and that in doing so country A is implicitly taking into account the effects of policy reactions² by countries B and C to its own policy.

The impact on country A's welfare of these reactions is supposed to have been made endogenous into W_a as part of the W_b and W_c effects. In addition, the presence of W_c as one of the arguments of country A's welfare function reflects non-economical values that country A attaches to the other country's welfare.

Country A's welfare monotonically increases as its MSSW increases. In addition, country A's welfare is positively related to country C's welfare because of a concern of country A for country C's economic growth, (while country A is indifferent to increases in country B's welfare). The same welfare decreases (due to retaliation in other markets, for example) when country B's and/or C's welfare decreases because of country A's policies. These assumptions about country A's welfare function may be synthesized as follows:

$$\begin{aligned} \delta W_a / \delta \text{MSSW}_a &> 0; \delta W_a / \delta W_c > 0; \\ \delta W_a / \delta W_b^+ &= 0; \delta W_a / \delta W_b^- > 0. \end{aligned} \quad (4)$$

Consistent with the partial equilibrium nature of this paper, the impact of country A's three alternative trade policies on countries B and C is evaluated by tracing the changes in those countries of the sum of consumers' and producers' surpluses associated with the market under scrutiny.

An evaluation of the policies' impact on the world as a whole cannot be realized because of the assumptions made about country A's welfare function, which are needed to make country A's trade preference policy choice consistent with a welfare optimizing behaviour.³

To simplify the analysis, no trade policy intervention is assumed to be implemented by countries B and C in the market considered.⁴ In the basic scenario, country A is maximizing its welfare function by imposing a non-discriminatory per unit import tariff. Given this reference scenario, two policy changes are discussed: (i) country A eliminating the tariff, and (ii) country A eliminating the tariff on its imports from country C, but leaving the tariff level unchanged on its imports from country B. These policy changes will be treated as determined exogenously and may be thought of as induced by two different modifications of the parameters of country A's welfare function. In addition, it is assumed that country A grants the preferential treatment to country C under the condition that it does not arbitrage; that is, country C is not allowed to act *at the same time* on both sides of the market. Hence, whenever necessary, country C imposes a prohibitive tariff either on its imports from country B or on its exports to country A.

To introduce the basic tools used throughout the analysis, the market equilibrium in the case of no trade policy intervention (under the hypothesis that country C is a net exporter) is depicted in Figure 1. Domestic and world prices are expressed in the same unit, which, given the assumption of a fixed exchange rate, may be any of the three domestic currencies or a linear combination of them. In Figure 1a the three countries' excess demand/supply functions (E_i) are represented. For each country the excess function is obtained by horizontally subtracting the domestic inverse demand function from the domestic inverse supply function. Positive values on the horizontal axis will account for exports, negative values for imports. Country A's closed economy domestic equilibrium price, for example, is OC. If the world market equilibrium price is higher than

OC, country A is a net exporter; if the equilibrium price is lower than OC, country A is a net importer. In Figure 1b the world excess demand and supply functions are presented. They are given by the lines MNWQ and GHIL, respectively. Both imports and exports will now be read on the positive portion of the horizontal axis. The world excess supply function is obtained by summing horizontally the portions of the domestic excess functions which lie in Figure 1a to the right of the vertical line. The world excess demand function is given by the mirror image of what is obtained by summing horizontally the portions of the domestic excess functions lying in Figure 1a on the left of the vertical line.

Traditionally, when excess demand and supply functions are used, each country is considered as acting *only on one side* of the world market, either as an exporting country or as an importing one, regardless of the price level. No switching is allowed from one side of the market to the other as the price changes. However, any country will be willing to move from the importers' side to the exporters' side given a sufficiently high increase of the world equilibrium price. A switch in the opposite direction, of course, will always be possible if there is a sufficiently large decrease of the world price. In both theoretical and empirical research analysing trade policy changes, the no-switch hypothesis induces relevant distortions whenever (a) in the reference scenario one or more countries have a degree of self-sufficiency close to one, and/or (b) a far from marginal change in the world market equilibrium price is considered.

The free trade equilibrium in the world market is given by the intersection of the world excess demand and supply functions. In Figure 1b the world market equilibrium price is OP, which is the domestic equilibrium price in each of the three countries as well. The traded quantity is OX_1 . Country A, the only importer, imports OX_a (which is equal to OX_1). Countries B and C export OX_b (which is equal to OR) and OX_c (which is equal to RX_1), respectively. Country A's gains from trade (that is, the net gains in terms of consumers' plus producers' surplus accrued by country A through international trading) are given by the area PSM in Figure 1b, which is equal, by construction, to area CDP in Figure 1a. Country B's gains from trade equal area GPZ (which is equal to area AFP), country C's equal area HSZ (which is equal to area BEP).

THE ANALYSIS

The basic scenario is the one in which country A imposes a non-discriminatory tariff (NDT). The two policy options to be considered here are: country A eliminating the tariff (FT), and country A eliminating the tariff with respect to its imports from C only, leaving a discriminatory tariff on its imports from B (DT). Regardless of its policy choice, country A is assumed to be a net importer. Country B is assumed to be a net exporter. Four different cases, covering all possible scenarios with respect to the position on the market of country C, the beneficiary country, are possible: country C (a) being an importer whatever policy country A implements; (b) being an exporter whatever policy country A implements; (c) being an importer if A imposes a non-discriminatory tariff and in the free trade scenario, but being able either to move to the exporter's side or to act as an importer when A imposes a discriminatory tariff on its imports from

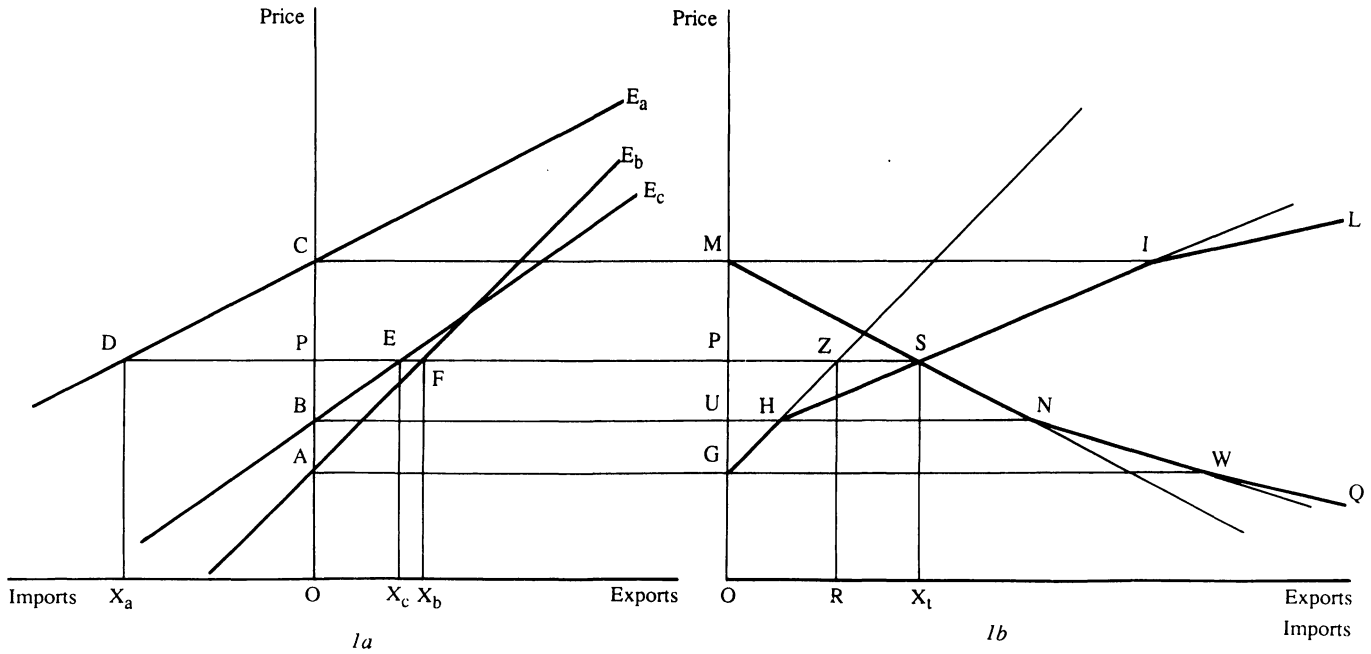


FIGURE 1 *Three country world trade equilibrium*

B; (d) being an importer when A imposes a non-discriminatory tariff, an exporter if free trading occurs, and being able to act either as an exporter or as an importer if A imposes a discriminatory tariff on its imports from B.

Only one case ('d' above) is discussed in detail here, but the results for all the four scenarios describing the different possible positions in the market of the beneficiary country are presented in Table 1.⁵

The starting scenario is characterized by country A imposing a non-discriminatory per unit tariff on its imports. The amount of this tariff is supposed to be optimal with respect to its welfare function. In Figure 2a the trade liberalization is represented. The world excess supply and excess demand are expressed as functions of country A's equilibrium price. The no-tariff excess supply is given by the line D'E'F'. The portion D'E' coincides with the lowest part of country B's excess supply. At equilibrium prices greater than OS' country C is willing to become an exporter as well. This determines the change in the slope of the world excess supply at E'. The tariff imposed by country A is equal to DD', and is introduced in the market specification through a parallel upward shift of the D'E'F' curve to DEF.⁶ The excess demand curve needs to be modified as well to take into account the fact that country B's exports to country C do not face any tariff. This is accomplished by modifying the excess demand curve from the no-tariff one (AB'C') to the one represented by the line ABC.

At the equilibrium, the domestic price in country A is equal to OP_a . Countries B and C's domestic price equals $OP_{b,c}$. The volume of trade is equal to OT. Country B Exports OI_a to country A and I_aT to country C. Country B's gains from trade are given by the area P_aGD , or, equivalently, by $P_{b,c}ND'$. Country C's gains from trade are equal to the area BHG. In country A, producers' and consumers' net gains from trade (under the assumption that the tariff revenue is allocated among them as a lump sum transfer) are given by the area $AHRP_{b,c}$.

Now assume that country A eliminates the tariff across the board due to a change in the weights attached to the arguments of its welfare function. The trade liberalization drives the equilibrium from G to G'. A is now the only importer (the volume of its imports being equal to OT'), while B and C are both exporting (OE_b' and $E_b'T'$, respectively). The equilibrium price in all three countries equals OP' . In the particular setting represented in Figure 2a, country C, which is exporting under the free trade option, is made better off by the imposition by the importing country of a non-discriminatory tariff (notice the area of the triangle BHG is bigger than that of the triangle E'H'G'), with a result which may appear counter-intuitive. The imposition of the tariff causes a price decrease which makes country C move from the exporters' side to the importers' one, and this switch is such that its welfare increases. Analogously, another possible result (not shown here) is that an importing country could be made better off by a trade liberalization. In this case, the elimination of the tariff drives the price up and this price increase makes the country switch from the importers' side to the exporters' one with an increase in welfare. All these possible outcomes are implicitly neglected in those empirical and theoretical research models which do not allow countries to move from one side of the market to the other as the price changes.

The trade liberalization makes country B definitely better off, its welfare increasing by the area $P'H'NP_{b,c}$. The sign of the change of country A's MSSW

is ambiguous. This change is given by the difference between the area of the triangle $HG'V$ and that of the rectangle $P'VRP_{b,c}$.

An interesting outcome is obtained when we consider the trade preference policy option. Moving from a non-discriminatory tariff to a discriminatory one (assuming the amount of the tariff remains unchanged) only affects the representation of the excess supply curve (Figure 2b), now given by $DE''F''$. This change is needed in order to make the exports from country C not subject to country A's tariff. In this case country C has to choose between two distinct feasible market equilibria in which it is trading on different sides of the market. A choice would be required at this point under the assumption that country C cannot *at the same time* export to country A and import from country B, thereby cheating on the trade preference granted by country A. Country C must choose between two alternative feasible market equilibria: one in which it acts as an exporter, making use of the trade preference (in this case the market equilibrium in Figure 2b will be in G''); the other in which it acts as an importer, choosing not to use the preferential treatment granted by country A, (the market equilibrium will be in G). The choice is made on the basis of its welfare associated with the two possible outcomes. In the specific case represented in Figure 2b, country C is better off by capitalizing on the preferential treatment granted (the area $E''G''H''$ is greater than the area BGH). However, in another case, the other alternative might have been more profitable.

The impact on country B of the implementation of the trade preference policy is a function of country C's choice. If country C chooses to make use of the preference and to become an exporter, country B is definitely worse off, its welfare decreasing by the area $NMP''P_{b,c}$. If country C finds it more profitable not to move to the exporters' side, country B's welfare remains unchanged, and the non-discriminatory tariff scenario and the discriminatory tariff one are equivalent. The free trade policy scenario is preferred by country B whatever country C's policy choice is when the preferential trade policy is implemented (Table 1).

If country C finds it profitable to switch to the exporters' side, the impact on the sum of country A's consumers' and producers' surpluses and of the tariff revenue remains ambiguous, and is given by the difference between the sum of the areas of the triangle HSG' and of the rectangle $P_aTH''P_{a,c}$, and the area of the rectangle $H''SRU$.

Country C is never worse off under the discriminatory tariff than under the non-discriminatory one. On the other hand it may be definitely better off in the preferential trade scenario. When the discriminatory tariff and the non-discriminatory tariff options are equivalent, the free trade scenario is definitely ranked as the worst scenario. When the discriminatory tariff is clearly preferred by country C over the non-discriminatory tariff, the discriminatory tariff is definitely preferred to both the other two policy options. However, country C's relative ranking of the other two policies (non-discriminatory tariff and free trade) remains undetermined.

TABLE 1 Generalized versus preferential tariff reduction: a comparative analysis of the welfare impacts

		Country A			Country B	Country C					
		CPS	TR	MSSW	W	W					
Scenario (a)											
NDT to FT		+	-	?	+	-					
NDT to DT		=	=	=	=	=					
Rankings:	NDT	2	1	?	2	1					
	DT	2	1	?	2	1					
	FT	1	3	?	1	3					
Scenario (b)											
NDT to FT		+	-	?	+	+					
NDT to DT		+	-	?	-	+					
Rankings:	NDT	3	1	?	2	3					
	DT	2	2	?	3	1					
	FT	1	3	?	1	2					
Scenario (c)											
NDT to FT		+	-	?	+	-					
NDT to DT:											
i. C import		=	=	=	=	=					
ii. C export		+	?	?	-	+					
Rankings:		i.	ii.	i.	ii.	i.	ii.				
	NDT	2	3	1	?	?	?	2	2	1	2
	DT	2	2	1	?	?	?	2	3	1	1
	FT	1	1	3	3	?	?	1	1	3	3
Scenario (d)											
NDT to FT		+	-	?	+	?(i:-,ii:?)					
NDT to DT:											
i. C import		=	=	=	=	=					
ii. C export		+	?	?	-	+					
Rankings:		i.	ii.	i.	ii.	i.	ii.				
	NDT	2	3	1	?	?	?	2	2	1	?
	DT	2	2	1	?	?	?	2	3	1	1
	FT	1	1	3	3	?	?	1	1	3	?

Notes: NDT: Non discriminatory tariff
 DT: Discriminatory tariff
 FT: Free trade
 CPS: Consumers' plus producers' surplus
 TR: Tariff revenue
 MSSW: CPS + TR
 W: Welfare

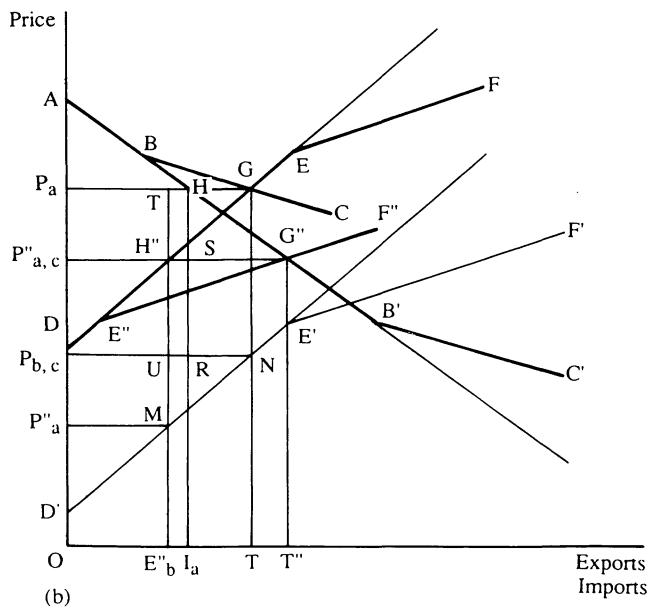
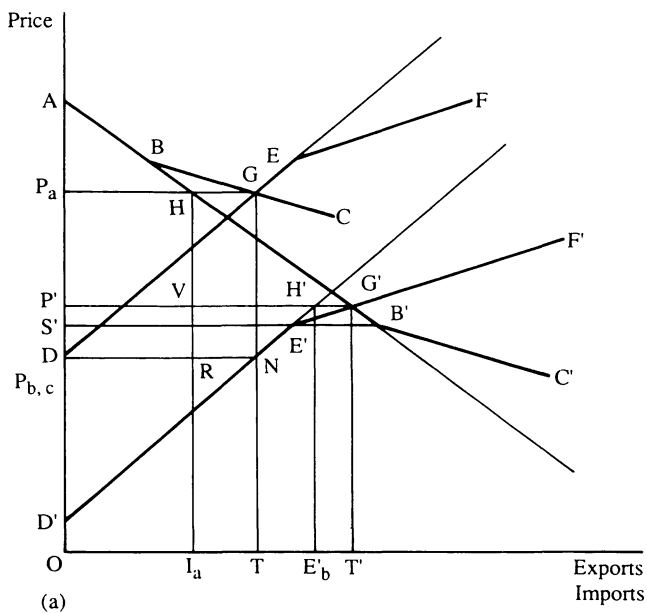


FIGURE 2 Preferential vs. generalized tariff reduction (case "d")

CONCLUDING REMARKS

The paper's main goal was to comparatively evaluate, on a theoretical basis, the welfare implications of a preferential tariff reduction with those of a generalized tariff reduction. The analysis has been developed using a model which allows the switching of the beneficiary country from one side of the market to the other as the price changes. Some interesting analytical implications of the switching hypothesis have been outlined, such as the possible existence of multiple feasible equilibrium solutions, and the case of an exporting country made better off by the imposition of a tariff by an importing country.

With respect to the paper's main objective, the results (shown in Table I) may be summarized as follows:

- 1 Whatever the position of the beneficiary country on the world market, it will *always* be better off under a preferential tariff reduction than under a generalized tariff reduction.
- 2 In the cases labeled (a) and (c) the beneficiary country is made worse off by a generalized tariff reduction than by a non-discriminatory tariff; this result may be true as well in case (d).
- 3 From the donor country's point of view, for a given beneficiary country benefit, the cost under the generalized tariff reduction will *always* be greater than the one under the preferential tariff reduction.
- 4 The non-targeted country, under the hypothesis made in the paper (that is, that it is an exporter whatever country A's policy is), will *always* be better off in the generalized tariff reduction scenario than in the preferential tariff reduction one.

Based on the results of this analysis, we may conclude that many importing and exporting developed countries have taken positions consistent with their own self-interest when it came to advocating general rather than preferential tariff reductions as a means to assist less developed countries. However, if the interests of less developed countries alone were considered, the paper's findings suggest that there is no good reason to suppose that less developed countries would be any better off under a generalized tariff reduction than under a preferential tariff reduction.

NOTES

¹A similar social welfare function has been proposed, in a framework similar to the one considered here, by McCulloch and Pinera (1977). The arguments of the welfare function they define, however, do not contain the non-preferred country's welfare. By doing so they leave unjustifiable a donor country policy which prefers the exports from the beneficiary country without imposing a prohibitive tariff on the non-preferred country's exports.

²Only countries negatively affected by country A's policy changes are assumed to react.

³Blackhurst (1972) used the sum of consumers' and producers' welfare and of the tariff revenue to evaluate the comparative impact on the world's welfare of a preferential versus a generalized tariff reduction. However, the preferential trade policy option is not consistent with a donor country's behaviour maximizing a welfare function whose arguments are producers' and consumers' surpluses plus tariff revenue only. The consequence is that one of the following two options

must hold: (a) if the policy choices he considers are rationally justified, then a world's welfare function defined as the sum of producers' and consumers' surplus plus the tariff revenue is not given by the sum of each country's individual welfares; or (b) if the world's welfare is given by the sum of the individual countries' welfares, then the 'donor' country's preferential trade policy remains unjustifiable, because it clearly reduces the sum of domestic producers' and consumers' surpluses and of the tariff revenue.

⁴The only exception, as discussed below, will be the imposition by country C, whenever this is necessary, of a prohibitive tariff to make any arbitraging unprofitable.

⁵A detailed discussion of all cases can be found in Anania (1988).

⁶The graphic analysis expands on the work by Johnson (1957,1958). The main difference between this paper's treatment and Johnson's (as well as Blackhurst's, which makes use of Johnson's graphic representation) is given by the fact that in that model no switching from one side of the market to the other is allowed as the equilibrium price changes. As a result, the excess demand function is misspecified, leading to the identification of incorrect market equilibria.

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DISCUSSION OPENING – SIEW-HOEY TAN

Giovanni Anania has presented a very lucid and stimulating exposition of the comparative welfare effects of alternative unilateral tariff reductions by donor countries. By concentrating on the welfare optimizing behaviour of one donor country, A, rather than on a global evaluation, he has succeeded in providing further interesting insights into the effects of tariff reductions.

His approach differs substantially from that of other scholars cited in his paper. The motive for A's intervention is to satisfy its domestic welfare function which explicitly takes into consideration C's welfare (the beneficiary country). For some altruistic reasons, A's welfare increases with increases in C's welfare, while it is indifferent to that of B's. Accordingly since A is the only buyer, it uses its market power by imposing an optimal tariff to achieve its welfare objectives.

He then made the innovative assumption of allowing country C to switch market positions in response to the tariff strategies pursued by A. In this manner he overcomes the distortions arising from fixing countries' positions *a priori* when they are already close to self-sufficiency levels or when the resulting price changes are large. The excess demand curve represents not only A's demand but that of the other two countries as well.

Under this integrative framework an interesting case arises in which regardless of whether A imposes a non-discriminatory tariff (NDT) or a discriminatory

tariff (DT), country C can in fact gain more as compared to a free trade scenario. With an NDT which prices C out of the export market, its ability to switch enables it to overcome the adversities of movements in the terms of trade arising from A's tariff strategy. This situation offers a fresh perspective that targeting the welfare of C need not always be via the imposition of a preferential tariff. In the case of the preferential tariff, there are two feasible market equilibria for C—it can choose to be an importer or an exporter, the choice of course being the position that maximizes its own welfare. Should it choose not to make use of the preferential treatment, it is prohibited from gaining through arbitrage. At this point, the assumption that C and B do not pursue trade policies is relaxed in the case of C.

All the interesting outcomes arise from this switching capacity. Countries B and C are also assumed to be maximizing only the producer-consumer surplus in their welfare functions. Unlike A, they do not attach non-economic values in their natural welfare. My comments refer to the earlier version of his paper. Giovanni has however just indicated that the outcomes remain, even with the relaxing of this assumption to include foreign exchange constraints.

An intriguing inference can be made from Figure 2a in which C gains from the imposition of an NDT. When C switches market position it becomes an importer, leaving B as the sole supplier. In its desire to improve its welfare and that of C's, A's NDT strategy results in a change in the market structure against its own interests. It is for this reason of avoiding changes in the market structure that Johnson's graphic analysis (cited in Giovanni's paper) does not permit market switch.

The ability of country C to switch market position also depends on what proportion of the commodity previously exported is retained for home consumption. Many less developed countries producing agricultural raw materials lack the domestic absorptive capacity for such output. It might be relatively easier for short-term crops (again assuming that employment is not an important concern) but not so in the case of tree crops. For example in the case of rubber or oil-palm cultivation, investment decisions are taken over a time horizon of 25 years, well beyond the time-frame of partial equilibrium models. Furthermore the constraints of comparative statics ignore the possibility of advances in technology which could postpone the switch from exporter to importer status. I bring this up because most developing countries are primary producers.

The switching capacity introduces the competitive dimension into the discussion of approaches to tariff reductions. Anania's conclusion that the beneficiary country would always be better off under a preferential tariff reduction while developed country exporters would always prefer NDT reductions reflects the differences in the relative competitive capacities of the two groups of countries. In fact, international competitiveness in agriculture lies at the crux of the Uruguay Round discussions. Thus more competitive producers clamour for generalized tariff reduction since preferential reduction is a less costly means for donor countries to transfer to less developed countries at the expense of the former. Targeting assistance to the less developed countries through preferential tariff reductions is not always fully effective. Developed country exporters can benefit from the donor country's tariff policy by locating its farms or plantations behind the donor's tariff walls or investing in the developing countries. Part of the benefit is thus syphoned off as proponents of free trade argue.

Overall, Anania's model provides a useful framework for understanding the impact of divergent approaches to tariff reduction and, accordingly, the interests of the groups associated with each stand. The limitations of partial equilibrium analysis notwithstanding, it would appear that a free-trade scenario would be sub-optimal for the developing countries. Special considerations toward these countries in terms of tariff strategies are, in the final analysis, fulfilling the interests of the donor countries themselves.