

# Endogenous Preferential Trade Agreements

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## Abstract

This paper shows that preferential trade agreements can emerge in an endogenous way. We use a simple international trade model where governments fix their tariffs in order to maximize social welfare. We find that when countries behave in a non co-operative way this performance leads to tariff discrimination. This result holds whether firms play a Cournot strategy or whether they follow a Stackelberg's leader-follower strategy. This paper also analyzes whether multilateralism and regionalism are complementary or substitutive processes. It is concluded that, in spite of the fact that absolute protection is reduced as a result of the economic integration process, relative protection against the rest of the world increases and, therefore, the two processes should not be considered as complementary. (JEL Classifications: F15; F14; F13.) <Key Words: Economic Integration Country and Industry Studies of Trade Commercial Policies.>

## I. Introduction

Traditionally, multilateralism and the General Agreement on Tariffs and

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Trade (GATT) have dominated trade policy. More recently however trade policy has tended to focus more on preferential trade agreements (PTAs), which are the subject of this paper. The literature on preferential trade agreements is growing, both in volume and complexity. The object of this paper is to analyze some of the implications of such agreements for the organization of the world economy.

Regional integration affects both, member and non-member countries and generally influences the nature and complexion of the relationship which exists between them both. This paper deals with two interrelated questions:

First, why do PTAs exist? In other words, why, and under what circumstances will countries have incentives to impose discriminatory tariffs on their imports? Article XXIV of GATT, which is the only exception to the most favored nation principle, permits the existence or creation of PTAs when certain criteria are met. The basic policy goal is to allow preferential trade arrangements if they constitute a genuine attempt to develop free trade within the block. It has often been stated that the goal of article XXIV was to allow trade creating rather than trade diverting PTAs. Therefore, these agreements may be understood as a way of achieving the general liberalization of the world economy.

Second, does regional liberalization lead to a general liberalization of the world economy? In other words: Are regionalism and multilateralism complementary or substitutive processes? Most economists agree that even if trade blocks are likely to produce an overall increase in trade for member countries, they in fact constitute a step backwards in the quest for multilateral free trade. In this sense, two results are possible: first, bilateral agreements may jeopardize the multilateral agreement; or second, bilateralism need not necessarily endanger the multilateral agreement, and might even enhance it. This paper not only deals with this idea, but also looks at whether the consequences of regionalism would be a world made up of a few relatively stable trade blocks or whether it would tend towards a free trade situation.

Most analysis of PTAs focus on whether they represent a step towards trade liberalization or protectionism. The work of Viner [1950], which should be considered as the reference point of economic integration theory,

captured the fundamental ambiguity of the effects of PTAs in defining the concepts of trade creation and trade diversion.

Traditionally, the formation of PTAs was justified by taking into account both static and dynamic effects. A good summary on traditional theory is Bhagwati and Panagariya [1996]. Recently Mendez-Naya [1996] justified the existence of regional integration by considering the existing economic interdependence between countries. Until now, however, most attempts to justify the formation of PTAs have assumed a certain amount of co-operation among the member countries.

This paper proves that such agreements can emerge in an endogenous way as a result of non co-operative performance among countries. That is, an individual country imposes discriminatory tariffs on its imports depending on where these imports come from. In this way, we justify the formation of a preferential trade club, what generally represents the first step in any regional economic integration process.

Our analysis is in accordance with Cooper-Massell [1965], because our objective is not to ascertain what the economic effects of a particular type of economic integration process are but to explain how it came to exist in the first place. Our result, in accordance to Cooper-Massell, is that economic integration processes should be understood as alternative commercial policies. Specifically, it is proved that two countries will have incentives to impose discriminatory tariffs and therefore to form a preferential trade club, as a way of protecting themselves against an external producer who has a cost advantage.

The model we present deals with the existing relationship between market structure and international trade. This relationship exists in both directions, that is, market structure may influence the volume and structure of international trade and international trade may influence market structure. Specifically, we analyze the extent to which multinational firms influence international trade relations. Once more, the relationship exists in both directions: multinational firms' strategies influence governments' decisions and vice versa. This reciprocal effect has been studied by several authors such as: Stopford and Strange [1991], Dunning and Robson [1988] and Rugman and Verbeke [1991].

In our model, as in that of Brander [1981] and Brander and Krugman

[1983], the existing pattern of trade among countries is the result of the strategic interaction among firms. Specifically, the rivalry of oligopolistic firms gives rise to reciprocal dumping in foreign markets. Firms apply discriminatory prices and charge lower prices abroad than at home. This strategic interaction among firms serves as an independent cause of international trade and results in two way trade in identical products.

With respect to the effects of economic integration on the general liberalization of the economy, it is shown that when two countries, which form a preferential trade club, decide to increase the level of economic integration among themselves by setting tariffs in a co-operative way, the levels of both, internal and external tariffs decrease. This result would seem to indicate that regionalism leads to a liberalization of the world economy. However it can be argued that although external tariffs decrease this reduction is not as great as the comparative reduction in internal tariffs and thus "relative" protection increases. Therefore, following Sapir [1993] it can be said that the world economy is experiencing strategic integration or closed regionalism. The analysis of the effects of regionalism on general liberalization has been studied in Bhagwati [1993], Chilchilniski [1996], Winters [1994], and Westhoff, Yarbrough and Yargrough [1994], among others, and the results obtained are ambiguous.

The main results of the paper point to the fact that PTAs emerge endogenously, and regionalism and multilateralism should be understood as substitutive processes, which remains true whether firms follow a Cournot strategy or whether they follow a Stackelberg's leader follower strategy.

The paper is set out as follows: section II describes the basic model and section III analyzes both non co-operative and co-operative performances, and presents the results which are obtained.

## **II. The Model**

In order to carry out the analysis, we use a simple international trade model. We consider two symmetric countries, a home country and a foreign country, and two symmetric firms, one located in each country. It is assumed that both firms have market power and that both are producing the same homogeneous good.

It is further supposed that there is a multinational firm which has a cost advantage and is located in a third country. This multinational produces the same homogeneous good and sells it in both countries.

To summarize, the three firms (national, foreign and multinational) are selling their product in both markets (national and foreign) so the existing market structure is one of oligopoly in both markets.

The firms' profit functions are given by the following expressions:

$$\begin{aligned}\Pi_X &= PX + P^*X^* - C_S(X + X^*) - C_T X^* - T_S^* X^* \\ \Pi_Y &= PY + P^*Y^* - C_S(Y + Y^*) - C_T Y - T_S Y \\ \Pi_L &= PL + P^*L^* - C_L(L + L^*) - T_L L - T_L^* L^*\end{aligned}\quad (1)$$

where asterisks refer to the second country's variables.  $\Pi_X$ ,  $\Pi_Y$  and  $\Pi_L$  are the profits of the national, foreign and the multinational respectively and  $X$ ,  $Y$  and  $L$  the quantity sold by these firms within the home market.  $P$  represents the market price and  $T_S$  and  $T_L$  represent the first country's tariffs on the foreign and multinational firms' goods respectively.  $C_S$  is the unit cost of production for both the national and the foreign firm and  $C_L$  is the cost of production for the multinational firm, therefore constant returns to scale are assumed.  $C_T$  represents transportation costs for both national and foreign firms. It is assumed that transportation costs of the leader are included in its unit production cost and it is verified that  $C_L < C_S + C_T$ .

In order to determine market equilibrium for both countries, two scenarios are distinguished: in the first, it is supposed that firms act according to a Stackelberg's leader-follower strategy where the leader is the multinational firm. In the second, it is supposed that firms follow a Cournot strategy. In addition, it is assumed that each country uses its tariffs on imports to maximize its own social welfare.

In order to highlight the features of the analysis as simply as possible, let us consider the following welfare function:

$$W = U(Q, Z) - PQ + \pi_X + T_S Y + T_L L \quad (2)$$

where  $U(Q, Z) - PQ$  represents consumer surplus, and  $Q = X + Y + L$  the quantity sold in the home market. Consumers maximize  $U(Q, Z) = aQ - (b/2) Q^2 + Z$ , subject to the aggregate budget constrain given by:  $M - PQ - Z = 0$ , where  $Z$  represents the consumption of the rest of goods. From this function the

inverse demand function is derived:

$$P = a - b(Q) \quad (3)$$

This analysis also applies to the second country.

Our objective in the next section is to determine the optimal equilibrium tariffs and to ascertain the effects of such tariffs on the three firms' behavior in both, the Cournot and the Stackelberg scenarios.

### III. Optimal Commercial Strategies

As we have already stated, it is assumed that both countries establish their tariffs in order to maximize their welfare. Two courses of action are possible: the first would be to act in a non co-operative way, that is, when each country acts individually and establishes its tariffs in order to maximize its own welfare function. In the second, they decide to co-operate, that is, they reach an agreement and set their tariffs in order to maximize a joint welfare function.

#### A. Non Co-operative Performance: The Decision to Form a Preferential Trade Club.

In this section, it is assumed that both countries act individually in a non co-operative way.

Let us begin with the Stackelberg scenario. The maximization process gives in the following equilibrium tariffs:

$$\begin{aligned} TS_S &= \frac{2a - 5C_S - 3C_T + 3C_L}{8} \\ TS_L &= \frac{2a - C_S + C_T - C_L}{8} \end{aligned} \quad (4)$$

$TS_S$  and  $TS_L$  being the tariffs imposed on the follower firm and the leader respectively. These tariffs indicate that countries fix their tariffs depending on where the goods come from. Therefore, we may conclude that non co-operative performance leads to tariff discrimination, which is an interesting

result since it is one of the main characteristics of all integration processes.

From the above tariffs the equilibrium quantities and price are obtained:

$$\begin{aligned}
 XS &= \frac{2a + C_T - 5C_S + 3C_L}{6b} \\
 YS &= \frac{2a - 11C_T - 5C_S + 3C_L}{24b} \\
 LS &= \frac{2a + C_T + 7C_S - 9C_L}{8b} \\
 PS &= \frac{2a + C_T + C_S + 3C_L}{6}
 \end{aligned} \tag{5}$$

The equilibrium price and the quantities must be positive, specifically YS must be positive and thus the following expression is verified

$$a > \frac{11C_T + 5C_S - 3C_L}{2} \tag{6}$$

And given the above equilibrium values the welfare function takes the following value:

$$\begin{aligned}
 WS &= \frac{1}{576b} (244a^2 + 445C_S^2 + 253C_T^2 + 333C_L^2 - 356aC_S \\
 &\quad - 92aC_T - 132aC_L + 230C_S C_T - 534C_S C_L - 138C_T C_L) + Z
 \end{aligned}$$

A similar analysis can be carried out for the Cournot scenario and the following equilibrium tariffs are obtained:

$$\begin{aligned}
 TC_S &= \frac{6a - 9C_S - 7C_T + 3C_L}{20} \\
 TC_L &= \frac{6a + C_S + 3C_T - 7C_L}{20}
 \end{aligned} \tag{7}$$

where  $TC_S$  and  $TC_L$  are the tariffs imposed in the Cournot contexts on the foreign follower firm and the leader respectively. Again the market equilibrium can be determined and is given by:

$$\begin{aligned}
XC &= \frac{2a + C_T - 3C_S + C_L}{5b} \\
YC &= \frac{2a - 9C_T - 3C_S + C_L}{20b} \\
LC &= \frac{2a + C_T + 7C_S - 9C_L}{20b} \\
PC &= \frac{2a + C_T + 2C_S + C_L}{5}
\end{aligned} \tag{8}$$

YC must be positive and in this case it is verified that:

$$a > \frac{9C_T + 3C_S - C_L}{2} \tag{9}$$

And the associated welfare is given by:

$$\begin{aligned}
WC &= \frac{1}{400b} (164a^2 + 219C_S^2 + 171C_T^2 + 91C_L^2 - 292aC_S \\
&\quad - 76aC_T - 36aC_L + 114C_S C_T - 146C_S C_L - 38C_T C_L) + Z
\end{aligned}$$

The equilibrium tariffs obtained show that tariff discrimination exist in both scenarios. However, our objective is to analyze the extent to which countries will have incentives to form a preferential trade club. To this end the relative size of the tariffs are calculated giving:

$$TS_L - TS_S = TC_L - TC_S = \frac{C_S + C_T - C_L}{2} \tag{10}$$

Taking into account the stated production and transport costs, the above expression will always be positive. This result means that countries will in fact form a preferential trade club irrespective of which firm's strategy is followed.

Proposition 1: PTAs are the result of countries' non co-operative performance so they emerge in an endogenous way.

## B. The Effects of Cooperative Performance: Regionalism versus Multilateralism

This section deals with one of the most widely discussed facets of economic integration analysis, specifically, the extent to which regional liberalization leads to a general liberalization of the world economy, or whether in fact the reverse is true and regional liberalization impedes global liberalization.

Economic integration processes are progressive, and countries only integrate those aspects of such processes, which are needed in order to achieve a greater degree of integration. All economic integration processes therefore, are generally characterized by the following phases: preferential trade club, free trade area, customs union and finally, economic and monetary union.

In the context of our model it is assumed that the countries, which are forming a preferential trade club, decide to increase their level of economic integration by setting their commercial policy, specifically their tariffs, in a co-operative way. In this case, both countries set tariffs in order to maximize their joint welfare, which is the result of adding together their individual welfare functions as follows:

$$= W + W^* \tag{11}$$

In the Stackelberg scenario the following equilibrium tariffs are obtained:

$$\begin{aligned}
 TS_S^C &= \frac{-2a + 5C_S + 13C_T - 3C_L}{2} \\
 TS_L^C &= \frac{C_S + 3C_T - C_L}{2}
 \end{aligned}
 \tag{12}$$

Market equilibrium can be written as:

$$\begin{aligned}
 XC^C &= \frac{2C_T}{b} \\
 YC^C &= \frac{2a - 9C_T - 3C_S + C_L}{2b} \\
 LC^C &= \frac{C_T + C_S - C_L}{2b} \\
 PS &= 2C_T + C_S
 \end{aligned}
 \tag{13}$$

Condition (6) gives a positive value for  $YS^C$ .

And given the above values the corresponding welfare level is:

$$\begin{aligned}
 S &= \frac{1}{2b} (2a^2 + 5C_S^2 + 11C_T^2 + 3C_L^2 - 4aC_S - 4aC_T + 10C_S C_T \\
 &\quad - 6C_S C_L - 6C_T C_L) + 2Z
 \end{aligned}$$

Similarly in the Cournot case:

$$\begin{aligned}
 TS_S^C &= \frac{-2a + 3C_S + 11C_T - C_L}{2} \\
 TC_L^C &= \frac{C_S + 3C_T - C_L}{2}
 \end{aligned}
 \tag{14}$$

Taking into account these tariffs the following equilibrium quantities and price are obtained:

$$\begin{aligned}
 XC^C &= \frac{2C_T}{b} \\
 YC^C &= \frac{2a - 9C_T - 3C_S + C_L}{2b} \\
 LC^C &= \frac{C_T + C_S - C_L}{2b} \\
 PS &= 2C_T + C_S
 \end{aligned}$$

Condition (9) gives a positive value for  $YS^C$ .

The associated welfare is:

$$\begin{aligned}
 C &= \frac{1}{2b} (2a^2 + 3C_S^2 + 9C_T^2 + C_L^2 - 4aC_S - 4aC_T + 6C_S C_T \\
 &\quad - 2C_S C_L - 2C_T C_L) + 2Z
 \end{aligned}
 \tag{15}$$

In order to understand the influence of co-operation on the general liberalization of the system, the relative magnitude of tariffs imposed on the leader's goods, in both the non co-operative and co-operative situation, must be analyzed. For this purpose the signs of the following two expressions are most revealing:

$$\begin{aligned}
 TS_L - TS_L^C &= \frac{2a - 5C_S - 11C_T + 3C_L}{8} \\
 TC_L - TC_L^C &= \frac{2a - 5C_S - 11C_T + 3C_L}{8}
 \end{aligned}
 \tag{16}$$

Given conditions (6) and (9) the above expressions are positive which means that co-operation leads to a reduction in the tariffs imposed on the three country's goods in both the Cournot and Stackelberg contexts. This

result seems to indicate that because co-operation between the PTA members leads to a reduction in external tariffs then both regionalism and multilateralism should be considered as complementary processes.

This is misleading since the relative protectionism against outside countries actually increases. The change in relative protection can be analyzed as follows:

$$\begin{aligned} (TS_L^C - TS_S^C) - (TS_L - TS_S) &= \frac{2a - 5C_S - 11C_T + 3C_L}{2} \\ (TC_L^C - TC_S^C) - (TC_L - TC_S) &= \frac{2a - 3C_S - 9C_T + C_L}{2} \end{aligned} \tag{17}$$

Once more the above expressions are positive if conditions (6) and (9) hold true.

Proposition 2: Co-operation between the PTA's members leads to an increase in the relative protection against the outside, that is, the increase in regional integration obstructs general liberalization. Therefore, both processes, regionalism and multilateralism, should not be considered as complementary.

Finally, we carry out the welfare analysis. First of all, it can be said that co-operation increases both countries' welfare. Specifically the following results are obtained in the contexts under consideration:

$$\begin{aligned} C - (WC + W^*C) &= \frac{9}{200b} (2a + C_L - 3C_S - 9C_T)^2 \\ S - (WS + W^*S) &= \frac{11}{288b} (2a + 3C_L - 5C_S - 11C_T)^2 \end{aligned} \tag{18}$$

The value of the above expressions is always greater than (or equal to) zero, which confirms that co-operation is advantageous for both countries in both cases. Furthermore, the expressions show that the greater the market size and the lower the multinational cost advantage are, the greater the gains from co-operation are.

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