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Non-Preferential Trading Clubs

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Abstract: This paper examines the welfare implications of non-discriminatory tariff reforms by a subset of countries, which we term a non-preferential trading club. We show that there exist coordinated tariff reforms, accompanied by appropriate income transfers between these countries, that unambiguously increase the welfare of these member countries while leaving the welfare of non-members unaltered. These tariff reforms are chosen to maintain world prices at their pre-club levels and, in this respect, the trading clubs act in a Kemp-Wan-like manner. In terms of economic policy implications, our results show that there exist regional, MFN-consistent arrangements that lead to Pareto improvements in world welfare. Open regionalism is an example of such trading arrangements.

JEL code: F15. Keywords: Trading clubs, non-preferential tariff policies, open regionalism, customs unions, Kemp-Wan proposition.

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1. INTRODUCTION

In his seminal book on "The Theory of Customs Unions", Meade (1955) addressed the following question: *when is a customs union involving only small tariff changes beneficial?* This question has been central to the literature on the economics of preferential trading arrangements, a survey of which has recently, and elegantly, been presented by Panagariya (2000) in the Journal of Economic Literature.[1]

The present paper asks a somewhat different question, viz.: *when is a trading club involving only small tariff changes beneficial?* With the difference between the two questions being only on customs unions vs. trading clubs, it is important here to clarify this difference. We define a trading club as a set of countries that choose to coordinate their tariff reforms and intra-club transfers, while a customs union is a set of countries that choose free internal trade, common external tariffs and intra-union transfers. Thus, by definition, the customs union is a preferential trade arrangement, while a trading club is not.

While academic research has only focused on well-defined preferential trading arrangements (customs unions and free trade areas), interest has been given to non-preferential trading arrangements by the policy debate concerning open regionalism. The present paper is the first to provide a theoretical justification for the advantages of open regionalism.

Open regionalism, embraced by the Asian Pacific Economic Cooperation (APEC) at its inception in 1989, was defined by its stronger advocates as trade liberalization by a group of countries based on an unconditional most-favoured-nation (MFN) principle.[2] In his discussion of open regionalism, Bergsten (1997) argues that an un-

[1] Bhagwati, Krishna and Panagariya (1999) provide a compendium of the major papers that have fashioned this literature.

[2] See, for example, Elek (1992).

conditional MFN trade liberalization will create benefits for non-members, who will then have a reduced incentive to reciprocally liberalize their trade.[3] Based on this free-riding problem of non-discriminatory tariff reductions, it is argued that open regionalism needs to be redefined before it can be proven operational.[4] What the present paper shows is that open regionalism (non-preferential trading clubs in our terminology) can be designed in a way that does not induce any free-riding by non-members.

By combining tools from multilateral tariff reform theory[5] and features of the Kemp-Wan mechanism[6] for the creation of welfare improving customs unions, we show that non-preferential trading clubs can be designed so that the countries that are members of the club are better off and the countries outside the club are not worse off. Within a many country, many commodity general equilibrium model of trade we prove a result that characterizes the necessary and sufficient conditions for a strict Pareto improvement in club welfare and that constitutes the first main formal contribution of this paper. Careful interpretation of this result (lemma) leads to a number of propositions that spell out the implications of our non-preferential trading clubs. These propositions show that, under weak conditions, a trading club can obtain a strict Pareto improvement in club welfare, while maintaining the welfare levels of all other countries at their pre-club levels. A sequence of such welfare improvements exists while ever the prices in the member countries are not all equal. In particular, our results show that the limit of such a sequence of trading-club equilibria is an equilibrium that is conditionally Pareto optimal for the club members. Moreover,

[3] See also Panagaryia (1999) for a similar view.

[4] In particular, Bergsten (1997) argues in favour of a conditional MFN principle, whereby APEC countries liberalize their trade with countries that also do the same.

[5] See, for example, Hatta and Fukushima (1979), Fukushima and Kim (1989), Turunen-Red and Woodland (1991, 2001) and Neary (1998).

[6] See, for example, Kemp and Wan (1976) and Ohyama (1972).

this conditionally Pareto optimal trading club equilibrium is shown to be welfare equivalent to the Kemp-Wan customs union - our second main formal contribution. Overall, the paper argues that there exist regional, *MFN-consistent*, arrangements that lead to Pareto improvements to world welfare.

The essential idea of using tariff policy to keep world prices fixed was originally used in the context of customs unions. It was first mentioned by Kemp (1964) and Vanek (1965) and later rigorously employed by Ohyama (1972) and Kemp and Wan (1976, 1986). More recently, McMillan (1993) and Srinivasan (1997) have proposed the rewriting of Article XXIV of the General Agreement on Tariffs and Trade on the basis of the Kemp-Wan mechanism for customs union formation. While the Kemp-Wan mechanism involves the setting of the union's common external tariffs to ensure that world prices are unchanged, it also requires the vector of external trade between the union members and the rest of the world to also remain unchanged. The latter property of the mechanism follows from the first if the countries outside the customs union remain passive following its formation.

Aspects of the Kemp-Wan mechanism have appeared in some studies outside the customs union context. First, Bagwell and Staiger (1999) have elegantly employed the "keeping-world-prices-fixed" idea in explaining the economics of GATT negotiations. They showed that negotiated tariff changes made under the principles of reciprocity and non-discrimination, the two pillars of the GATT, lead necessarily to fixed world prices, thus eliminating the incentive for aggressive use of optimal tariffs to generate favourable terms-of-trade effects. Unlike the Kemp-Wan mechanism, however, there is no restriction on the length of any (individual country or aggregate) trade vector, since all countries are assumed to participate in the negotiations. Second, Ohyama (2002) uses the Kemp-Wan mechanism in designing free trade areas that lead to

Pareto improvements in world welfare, thus extending the Kemp-Wan-Ohyama result for customs unions to free trade areas.

In the present paper, we make use of both aspects of the Kemp-Wan mechanism but our application is in yet a different area - that of trading clubs. We use the Kemp-Wan mechanism in our model of trading clubs to show that open regionalism can be made to work for the benefit of the world community.

The remaining of this paper is organized as follows. Section 2 sets up the framework that we use and derives the necessary and sufficient conditions for obtaining a strict Pareto improvement in trading club welfare. The Kemp-Wan-like construction, whereby world prices are kept fixed, ensures that a Pareto improvement in world welfare is achieved. Section 3 presents a number of propositions on piecemeal tariff reform by a trading club and also provides a novel diagrammatic exposition of these propositions. We demonstrate that the limiting case of a sequence of strict Pareto improving reforms by the club is conditionally Pareto optimal for the club. In section 4, we compare our conditionally optimal trading club with the Kemp-Wan customs union and establish the welfare equivalence of these two (conceptually different) regional arrangements.[7] Section 5 provides concluding remarks and links our theoretical results to several policy issues, including the philosophical bases for tariff reforms espoused by APEC and its open regionalism concept and the issue of the adherence of regional trading agreements to the WTO rules.

2. PARETO WELFARE GAINS IN TRADING CLUBS

The focus of this paper is on the welfare implications of tariff reform by a trading club. According to our definition, a trading club is a group of countries that agree to coordinate their non-discriminatory tariff policies and to undertake internal income

[7] While our optimal trading club is a non-preferential trading club, the Kemp-Wan customs union is a preferential one.

transfers. As such, a trading club differs from a preferential trading club, as defined by Kemp (1969), that provides preferential tariff rates to club members and hence is essentially discriminatory in its tariff policies. Special cases of a preferential trading club are free trade areas and customs unions, both of which completely eliminate taxes on internal trade.

As will become clear below, our trading club will be assumed to take on some essential aspects of a Kemp-Wan customs union. The following sub-section provides a specification of the model and the subsequent one provides a characterization of the necessary and sufficient conditions for the existence of strict Pareto improvements in the trading club.

2.1. The Model of World Trade. We consider a perfectly competitive general equilibrium model of the world, consisting of K nations trading in L internationally tradeable commodities. Following Turunen-Red and Woodland (1991), the model may be expressed as:

$$\sum_{k \in K} S_p^k(p^k, u^k) = 0 \tag{1}$$

$$p^{\intercal} S_p^k(p^k, u^k) = b^k,\ k \in K \tag{2}$$

$$\sum_{k \in K} b^k = 0, \tag{3}$$

in terms of the world price vector p ($p^{\intercal}$ denotes the transpose of a vector) and the domestic price vectors p^k for each country $k \in K$.[8] In this specification, $S^k(p^k, u^k) \equiv G^k(p^k) - E^k(p^k, u^k)$ is the net revenue function, being the difference between the gross domestic product function G^k and the consumer expenditure function E^k. Also, $S_p^k(p, u^k) \equiv \nabla_p S^k(p, u^k)$ denotes the gradient of the net revenue function with respect to prices and represents the vector of compensated net export functions for nation

[8]The notation K is used to denote the set of countries as well as the number of countries.

k. The specification of the technologies and preferences is very general. The national production possibilities sets satisfy minimal conditions such as convexity and allow for joint production and intermediate inputs, while the preferences also satisfy minimal conditions.[9] However, in this and the subsequent section, differentiability is assumed to permit the differential tariff reform analysis. Conditions sufficient for the existence of equilibrium for this tariff-distorted world economy are implicitly assumed.[10]

Equations (1)-(3) consist of the market equilibrium conditions, the budget constraints for each country and the world budget constraint. The market equilibrium conditions express the requirement that the net exports of countries, $x^k \equiv S_p^k(p^k, u^k)$, sum to the zero vector, meaning that world markets clear. The budget constraints state that the value (at world prices) of net exports (the balance of trade) must be matched by a transfer of income abroad, b^k. In our atemporal world, the national budget constraints are simply the requirements of zero current account balances. The world budget constraint require these transfers abroad to sum to zero over all countries.

It is implicit in this formulation of the model that there is just one consumer in each country, who receives a transfer from the government and has utility u^k.[11] The model is expressed in terms of domestic and world prices. These are connected by tariffs, which may be expressed in specific terms, whence we may write $p^k =$

[9] See, Diewert (1972) for a specification of the conditions on technologies and preferences underlying the revenue and expediture functions. Woodland (1982) also spells out these specifications and the properties of the revenue and expenditure functions.

[10] See, for example, Sontheimer (1971) for such conditions and a proof of existence of equilibrium in a tariff-distorted model of world trade.

[11] It is relatively straightforward to extend the model, at the cost of added notational complexity, to handle multi-household economies. In the case of multiple households, Pareto improvement may be ensured by assuming the existence of lump sum income transfers between households and the national governments. Alternatively, under appropriate assumptions, commodity taxes may be used to carry out internal Pareto-improving redistributions. See, for example, Diewert, Turunen-Red and Woodland (1989, 1991) and Dixit and Norman (1980).

$p^k(p, t^k) \equiv p + t^k$.[12]

In this paper, countries will be divided into two groups - those that wish to form a trading club and those that do not. The set of countries that form the trading club is denoted by K^M, while K^N is the set of non-club countries. Let $u = (u^M, u^N)$, $t = (t^M, t^N)$, and $b = (b^M, b^N)$ be obvious partitions of the vectors u, t and b into elements for club members (M) and non-member countries (N). The initial equilibrium, before the club is formed, is arbitrarily given and characterized by $(p, u) = (p_0, u_0)$ and $(t, b) = (t_0, 0)$. The initial equilibrium might, of course, be a Nash equilibrium in a non-cooperative tariff game but this interpretation is not essential. The post-club equilibrium involves the club members setting their own non-discriminatory tariffs and a system of intra-club income transfers.

2.2. Preliminary Lemma on Pareto Gains. The purpose of this sub-section is to characterize the conditions that are necessary and sufficient for obtaining a Pareto improvement in world welfare. Attention is restricted to policy initiatives by a subset of countries that we refer to as a trading club. According to our definition, a trading club chooses to undertake coordinated tariff reforms and intra-club transfers of income.

Attention is further restricted to a trading club that is assumed to behave in a Kemp-Wan-like manner in the sense that it coordinates its policy reforms to ensure that the world prices of traded goods are unaltered. As a consequence of this restriction on its choice of policy, the volume of trade with the rest of the world will also be unaltered provided that the countries in the rest of the world do not alter their tariff policies as a result of the club's activities. This passive policy behavior on the part

[12] The model may also be specified in terms of ad valorem tariff rates rather than specific (unit) tariff rates.

of the rest of the world will be assumed.[13] The task is to characterize the conditions whereby all members of the club gain in welfare. Given that the rest of the world's trading environment is unchanged, those countries will be unaffected by the club's policies. The outcome will be a strict Pareto improvement for the club, no change in welfare for the rest of the world and, hence, a semi-strict Pareto improvement in welfare for the world.

Specifically, the club is to choose domestic price vectors p^k, a vector of transfers b^M and a vector of utilities u^M that generate the same external trade vector as before, satisfy the aggregate balance of trade restriction at the same world prices as before and provide greater utility for all union members. Since the club's balance of trade restriction automatically holds ($p_0^\intercal x_0^M = -p_0^\intercal X^N(p_0, t_0^N) \equiv 0$) due to the price homogeneity properties of the foreign net export functions and since transfers are available, only the internal market equilibrium conditions are constraining for the club.

Given the requirement that the aggregate trade vector with the rest of the world is set at its the pre-club value, x_0^M, the internal market equilibrium condition may be expressed as

$$\sum_{k \in K^M} S_p^k(p^k, u^k) = x_0^M. \tag{4}$$

We now consider whether it is possible to alter the domestic prices and utilities so that this system of equations remains satisfied and every member country experiences a strict gain in utility. If so, a strict Pareto improvement has been established. It will

[13] As Richardson (1995) demonstrates via an example, the Kemp-Wan proposition may break down if the rest of the world alters its tariffs strategically. To counter this observation Kemp and Shimomura (2001) have provided a second "elementary proposition on customs unions" whereby the union chooses, not a common external tariff vector, but a common external *tariff function* that leaves the union's offer surface unchanged and thus ensures a strict Pareto improvement for the union irrespective of the response by the rest of the world. Both Richardson's critique and the Kemp and Shimomura response apply also to our analysis of trading clubs.

be shown, under certain assumptions, that a strict Pareto improvement in welfare for club members is possible if and only if there are price differentials among club members.

To proceed further, we differentiate the club market equilibrium conditions (4) totally to get

$$\sum_{k \in K^M} S^k_{pp}(p^k, u^k)dp^k + \sum_{k \in K^M} S^k_{pu}(p^k, u^k)du^k = 0, \tag{5}$$

where $S^k_{pp} \equiv \nabla^2_p S^k(p, u^k) = \nabla_p S^k_p(p, u^k)$ is the substitution matrix for country k, measuring the response of compensated net outputs to changes in prices, and $S^k_{pu} \equiv \nabla_{pu} S^k(p, u^k) = \nabla_u S^k_p(p, u^k)$ is a vector of 'income' effects for country k, measuring the response of compensated net outputs to changes in utility. We consider whether a solution to this system exists with $du^k > 0, \ k \in K^M$. To obtain our main result, the following assumption on technologies and preferences is made.

Assumption A: *(i)The club member countries' substitution matrices S^k_{pp} have maximal rank $N-1$. (ii) The club members' expenditure functions are strictly increasing in utility, that is, $S^k_u \equiv \nabla_u S^k(p, u^k) \ < 0$.*

Using this assumption, we obtain the following result that identifies the necessary and sufficient conditions for the attainment of a strict Pareto improvement in welfare for the club members.

Lemma: *Let Assumption A hold at the initial pre-club equilibrium. A strict Pareto improvement in club welfare exists if, and only if, domestic price vectors are not all the same (up to a factor of proportionality), i.e. $p^k \neq \alpha p^j$ for some j and k.*

Proof. We are concerned with whether a solution to the linear system (5) exists with $du^k > 0, \ k \in K^M$. By Motzkin's theorem of the alternative, as expressed in Diewert, Turunen-Red and Woodland (1989, p. 212), a solution exists if and only

if there does not exist a solution λ to the dual system

$$\lambda^{\intercal}[S^k_{pu}\ (k \in K^M)] < 0,\ \ \lambda^{\intercal}[S^k_{pp}\ (k \in K^M)] = 0, \tag{6}$$

where the inequality $x < 0$ means that vector x is semi-negative (all elements are non-positive and at least one element is negative).

(i) Let $p^k \neq \alpha p^j$ for some j and k. Since Assumption A holds, the equation system $\lambda^{\intercal} S^k_{pp} = 0$ only has the nontrivial solution $\alpha^k p^k$ $(\alpha^k \neq 0)$ and the equation system $\lambda^{\intercal} S^j_{pp} = 0$ only has the nontrivial solution $\alpha^j p^j$ $(\alpha^j \neq 0)$. For both equation systems to hold, as in the second part of (6), we need $\alpha^k p^k = \alpha^j p^j$ whence $p^k = (\alpha^j/\alpha^k)p^j$, which contradicts the assumption that $p^k \neq \alpha p^j$. Thus, (6) has no solution for λ and so, by Motzkin's theorem of the alternative, a strict Pareto improvement in union welfare exists.

(ii) Let all domestic prices be equal up to a factor of proportionality, that is $p^k = \alpha^k p^0$ where p^0 is the common price vector. Thus, $\lambda = p^0$ solves the equations $\lambda^{\intercal} S^k_{pp} = 0$ for all $k \in K^M$. Also, $\lambda^{\intercal} S^k_{pu} = p^{0\intercal} S^k_{pu} = (1/\alpha^k) p^{k\intercal} S^k_{pu} = (1/\alpha^k) S^k_u < 0$ for all $k \in K^M$ since $S^k_u < 0$ due to the assumption that the consumer expenditure functions are increasing in utility (part (ii) of Assumption A). Thus, there is a solution λ to (6) and hence, by Motzkin's theorem of the alternative, there does not exist a strict Pareto improvement in union welfare. ■

Before discussing this Lemma, some remarks on the nature of Assumption A and on the possibilities for its relaxation are in order.

Remark 1. *Part (i) of Assumption A implies that each member country has curvature to its net export function. It rules out, for example, the possibility of having both Leontief preferences and a pointed production possibilities frontier at the initial equilibrium, which together imply that net exports are not responsive to differential*

changes in prices. Moreover, while part (i) applies to every country, this requirement can be relaxed at the expense of a more cumbersome wording of the Lemma. All that is needed for the Lemma to hold is that there exists ***a pair of countries*** *(rather than all countries in the club) for which the domestic prices are different and for which the substitution matrices have maximal rank at the initial equilibrium.*[14]

Remark 2. *Part (ii) of Assumption A is very weak. It merely states that the consumer needs to spend more on goods to achieve a higher level of utility. This assumption is consistent with the inferiority of goods in consumption; indeed, only one good needs to be normal in consumption at each level of utility, possibly a different good at different level of utility. It is, therefore, the minimal normality assumption that can be made.*

The above Lemma establishes conditions under which a strict Pareto improvement in welfare may be achieved by a subset (trading club) of countries that choose changes in tariffs and internal transfers to ensure that the world price vector, and hence the vector of trade with the rest of the world, is unchanged. Provided that the rest of the world acts passively (does not alter tariffs) to the policy initiatives by the club, each nation in the rest of the world has unchanged utility since the world prices are unchanged. Accordingly, there is a semi-strict Pareto improvement for the world as a whole; club members gain, while all other countries neither gain nor lose. The necessary and sufficient conditions for a welfare gain are simply that the domestic price vectors of the club members are not all equal in the initial equilibrium.

[14]This part of Assumption A can be further relaxed by simply assuming that there is a pair of union members k and j such that the system $\lambda^{\intercal}[S^k_{pp} \quad S^j_{pp}] = 0$ has no solution $\lambda \neq 0$. This allows each national price substitution matrix to have less than maximal rank, implying linear dependence, but ensures that there are directions of price changes that change or 'control' net exports, thus providing the basis for effective tariff reform.

This Lemma leads to several interesting propositions concerning welfare reform, to which attention is now turned.

3. TARIFF REFORM IN TRADING CLUBS

To properly interpret the Lemma, it is important to be clear about the context and implications. The first point to note is that the trading club arranges its policy reform in such a manner that the world prices of all traded goods, and hence the vector of aggregate trade of the club members with the rest of the world, are unchanged. In this sense, the trading club adopts a Kemp-Wan approach to its policy choice. However, the second point to note is that the Lemma refers to *non-discriminatory* tariff reform by the members of the trading club. The club members each have arbitrarily given initial tariffs and choose to alter national tariffs in a non-discriminatory way. The resulting national domestic price vectors are, in general, different and there are no tariff preferences given to club members. Accordingly, the club is neither a free trade area nor a customs union. Third, an essential part of the co-ordination of tariff reforms by club members is a set of accompanying lump sum income transfers. It is these transfers that allow the club members to enjoy a strict Pareto improvement in welfare as a result of the tariff changes; every club member gains. Collectively, the club creates a more efficient allocation of resources within the club through its reform of tariffs and the transfers permit these efficiency gains to be distributed so that every country gains in welfare. Finally, because the countries in the rest of the world face the same world prices as before and, by assumption, choose to retain the same tariff policies as before, each country in the rest of the world has unchanged welfare.

Thus, we have the following proposition that follows from the Lemma.

Proposition 1. *Let Assumption A hold. Any subset of countries may form a trading*

club that undertakes a differential, non-discriminatory reform of tariffs and internal income transfers in such a way that there results a semi-strict Pareto improvement in world welfare (with a strict Pareto improvement for the club and unchanged welfare for each other country), provided the rest of the world adopts a passive policy response (the rest of the world's tariffs remain unchanged) and provided not every member of the trading club has the same (up to a factor of proportionality) domestic price vector. World prices and the vector of aggregate trade between the club and the rest of the world remain unchanged.

While this proposition bears a strong resemblance to Kemp and Wan's (1976) proposition on the formation of customs unions, the two propositions are quite different.[15] First, a Kemp-Wan customs union has internal free trade and hence tariff policies are inherently discriminatory; here the club employs non-discriminatory policies. Second, the Kemp-Wan proposition relates to a comparison of two discretely different equilibria; here the reforms are differential.[16] Third, while the Kemp-Wan proposition on customs unions establishes a weak Pareto improvement in welfare for the union members, our proposition established a strict Pareto improvement in which all members of the trading club experience an increase in welfare.

We now proceed to obtain further implications of the Lemma.

The Lemma establishes necessary and sufficient conditions for a *strict* Pareto

[15] The Kemp-Wan proposition is that any subset of countries can form a customs union agreement comprising internal free trade, a common external tariff and a set of internal income transfers to provide a weak Pareto improvement in welfare for all the countries of the world. If the initial equilibrium has sufficient distortions, the countries in the union will obtain strict welfare improvements. In either case, the Kemp-Wan customs union leaves the non-member countries as well off as before the formation of the union, an outcome ensured by setting the common external tariff such that world prices and the vector of trade between the union and the rest of the world are unchanged. See, also, Kemp and Wan (1986) for formal details on the assumptions underlying the proposition.

[16] Neary (1998) also considers a differential approach to the Kemp-Wan proposition. However, his emphasis is upon the replication of the Kemp-Wan proposition and not, as in this paper, on non-preferential trading clubs.

improvement in welfare for the trading club. This means that there exists a sufficiently small *discrete* change in member countries' tariffs and transfers that generates a small *discrete* increase in the utility levels of member countries.[17] This means further that, while ever domestic price vectors are not all the same, there is a sequence of small discrete policy changes leading to small discrete strict Pareto improving changes in club welfare. Thus, we establish the following proposition.

Proposition 2. *Let Assumption A hold. While ever the domestic price vectors of the trading club members are not all equal (up to a factor of proportionality), there exists a sequence of sufficiently small discrete changes in the tariffs and internal transfers of club members that yields small discrete strict Pareto improvements in club welfare provided the rest of the world adopts a passive policy response. At each stage in the sequence, world prices and the aggregate vector of trade between the club and the rest of the world remain unchanged.*

Figure 1 illustrates such a sequence for the case of two goods and two club members. The axes measure the amounts of the two goods. The point y is the club's aggregate production vector (assumed fixed for simplicity) while point c is its aggregate consumption vector before and after the formation of the club. The difference is the net import vector for the club, again both before and after the formation of the club. Thus, the figure reflects our adopted Kemp-Wan approach whereby the club ensures that the world price vector and, hence, the aggregate club trade vector with the rest of the world are the same before and after the formation of the club.

Figure 1: (about here)

[17] If only a weak Pareto improvement were required, a zero derivative of a country's utility level with respect to the policy parameters can be consistent with increasing, decreasing or constant response to a discrete policy change.

The rectangular box formed by the origin and aggregate production point y shows the allocation of production between the club members. Thus, point Y denotes the production points for the members (with origin for the production box at y for member 2).

The rectangular box formed by the origin and the point c is the Edgeworth-Bowley box for the analysis of intra-club exchange between the two club members. Thus O^1 denotes the origin for member 1, while c (labelled O^2) becomes the origin for member 2. Point C is the initial consumption point (showing vector c_0^1 from origin O^1 and vector c_0^2 from origin O^2). Clearly, this point is Pareto sub-optimal since the slopes of the indifference curves through this point (hence initial domestic prices) are different. Consumption points that are Pareto superior to C occur in the cigar shaped area labelled PCO. Pareto optimal points that are weakly preferred to C occur on the curve labelled PO.

Beginning at the initial consumption point C, the arrowed path indicates the sequence of small discrete changes to consumption for the two single-household members of the trading club. The initial Pareto-improving tariff reform takes the club from point C to point R. The next reform moves the club from point R in a Pareto-improving direction indicated by the arrow. At each stage in the sequence, the utility level for each member country increases. As shown in Figure 1, this sequence is arranged to converge to point Q, which lies on the Pareto optimal curve labelled PO. At this point no further Pareto improvements for the club are possible, leading us to the next proposition.

If the price vectors in each of the club member countries are equal (up to a factor of proportionality) then Proposition 2 does not apply and so further strict Pareto improvements in welfare are not possible. This equilibrium with all domestic

price vectors equal is now shown to be *Conditionally Pareto Optimal* for the trading club in the sense that the equilibrium is Pareto optimal for the members of the club, given that the trading club employs a Kemp-Wan-like policy whereby world prices for traded goods are kept at their initial pre-club values. Accordingly, given the Kemp-Wan-like policy, the resulting equilibrium is Pareto optimal in that no member can be made better off without making some other member worse off.[18] In short, the term conditional Pareto optimality for the club means that Pareto optimality is restricted to club members and to a situation where the Kemp-Wan construction of fixed world prices occurs.

Thus, we have the following proposition.

Proposition 3. *Let Assumption A hold. If all members of the trading club have the same (up to a factor of proportionality) domestic price vectors then the equilibrium is conditionally Pareto optimal for the club and every member imposes a common, non-discriminatory tariff vector.*

Proof. We are concerned with whether a solution to the linear system (5) exists with $du^M > 0$ (a *weak* Pareto improvement). By Motzkin's theorem of the alternative, as expressed in Mangasarian (1969, p.34), a solution exists if and only if there does not exist a solution λ to the dual system

$$\lambda^{\intercal}[S^k_{pu} \ (k \in K^M)] \ll 0, \ \ \lambda^{\intercal}[S^k_{pp} \ (k \in K^M)] = 0, \tag{7}$$

where the inequality $x \ll 0$ means that vector x is strictly negative (all elements are negative).

[18] It should be noted that the non-existence of a strict Pareto improvement from an equilibrium is logically different from the Pareto optimality of that equilibrium. Hence, the following proposition does require proof.

By assumption, all domestic prices are equal up to a factor of proportionality, that is $p^k = \alpha^k p^0$ where p^0 is the common price vector. Thus, $\lambda = p^0$ solves the equations $\lambda^\intercal S^k_{pp} = 0$ for all $k \in K^M$. Also, $\lambda^\intercal S^k_{pu} = p^{0\intercal} S^k_{pu} = (1/\alpha^k) p^{k\intercal} S^k_{pu} = (1/\alpha^k) S^k_u < 0$ for all $k \in K^M$ since $S^k_u < 0$ due to the assumption that the consumer expenditure functions are increasing in utility (part (ii) of Assumption A). Thus, there is a solution λ to (7) and hence, by Motzkin's theorem of the alternative, there does not exist a strict Pareto improvement in union welfare. ■

This proposition shows that the equality of domestic price vectors for each club member ensures conditional Pareto optimality for the trading club. Not only are strict Pareto improvements not possible (Proposition 1), but neither are weak Pareto improvements (in which at least one member gains and none lose) possible.

It is important to recognize that this proposition does not imply that the club members have internal free trade and, hence, the club is not a customs union. Each member country employs a non-discriminatory tariff vector against trade with every other country - club members and countries in the rest of the world are treated exactly the same as far as tariff policy is concerned. Moreover, a particular implication of the common domestic prices ($p^k = p^M$ for all $k \in K^M$) is that each country must have a common tariff vector $\tau^M = p^M - p$.[19] This means that the member countries have 'harmonized' their tariff vectors.[20]

On the other hand, the club members do have a system of internal income transfers that ensure that each member country benefits from the efficiency gains arising from the harmonization of tariffs. And, similarly to the Kemp-Wan construction of a

[19] The possibility that a Pareto optimal equilibrium could be supported by tariffs was noted by Mayer (1981, p. 142).

[20] However, note that this needs to be interpreted carefully since the member countries may, and generally will, have different trade patterns. Thus, for example, one member's import duty on tennis balls equals another member's export subsidy on tennis balls.

customs union, the policy parameters have been carefully chosen to ensure that world prices are unchanged and, hence, that the volume of trade with, and utility levels in, the rest of the world are unchanged. Thus, this Kemp-Wan-like trading club that eliminates all domestic price differences is conditionally Pareto optimal for the club and the equilibrium provides a strict Pareto improvement in welfare for the club compared to the initial situation and a semi-strict Pareto improvement in welfare for the world.

In summary, it is worth emphasizing that nowhere in the above proof of the Lemma or in the statement of Propositions 1-3 was it demanded that the club's internal trade should face zero tariffs. We demanded something more general, viz. that the domestic (club's internal) prices were equal. Thus, this generalized Kemp-Wan construction for trading clubs allows for non-discriminatory tariffs and does not require the club members to form a customs union with zero tariffs on internal club trade.

4. Optimal Trading Clubs and Customs Unions

The previous section dealt with differential tariff reform in the trading club. In the present section of the paper, we change direction and focus attention upon the properties of the equilibrium for a conditionally Pareto optimal trading club. In particular, we compare this equilibrium with that of a Kemp-Wan customs union made up of the same members. This comparison leads to interesting interpretations of the Kemp-Wan customs union.

As shown in the previous section, the equilibrium for a conditionally Pareto optimal trading club exhibits a world price vector unchanged from the initial equilibrium, common domestic price vectors for club members and a common non-discriminatory tariff vector. The Kemp-Wan customs union also exhibits an unchanged world price vector and common domestic price vectors but, by contrast, achieves these outcomes

via internal free trade and a common external tariff vector for union members. Nevertheless, the two equilibria are essentially identical as will be shown below.

Before proceeding to state the proposition establishing the equivalence between these two equilibria, it is helpful to first outline the model of a Kemp-Wan customs union and to contrast it with the model of a trading club dealt with in this paper. In the case of a customs union, there is a crucial distinction that needs to me made between internal union trade and external trade.[21,22] Defining the vector of trade of union member k within the union (U) as x^{kU} and with the rest of the world as x^{kN}, it follows that

$$x^k \equiv S_p^k(p^U, u^k) = x^{kU} + x^{kN},\ k \in K^U. \tag{8}$$

The union's internal market equilibrium condition is that

$$\sum_{k \in K^U} x^{kU} = 0. \tag{9}$$

The Kemp-Wan construction keeps the volume of club trade with the rest of the world fixed at x_0^U and so the world market equilibrium condition reduces to

$$\sum_{k \in K^U} S_p^k(p^U, u^k) = x_0^U, \tag{10}$$

similarly to a trading club.

The budget constraint for union member k is given by

$$p^{U\intercal} x^{kU} + p_0^{\intercal} x^{kN} = \beta^k,\ k \in K^U, \tag{11}$$

[21] This specification of the model of a customs union draws from Woodland (1982, pp. 352-353).

[22] There is an important exception to this statement about the need to distinguish between internal and external trade by union members. This exception occurs in a model where intra-union trade only involves a subset of goods that are not imported from the rest of the world (as in a model where each country k exports good k and imports all other goods - the so-called Meade trade pattern). In this case, non-discriminatory zero tariffs on this subset of goods by union members is equivalent to a customs union with discriminatory tariffs, since there is no external trade in these goods. See Melatos and Woodland (2002).

which is that the sum of the value of internal trades at internal union prices and the value of external trades at world prices (the balance of trade) must be matched by a transfer abroad given by β^k. The transfers are limited to union members and so the aggregate budget constraint for the union is that

$$\sum_{k \in K^U} \beta^k = 0. \tag{12}$$

This formulation of the model of a Kemp-Wan customs union differs from our model of the trading club acting in a Kemp-Wan manner in that the customs union model distinguishes between internal and external trade. Since internal trade is free in the union, this affects the tariff revenues. Nevertheless, despite this difference, our Pareto optimal trading club and the Kemp-Wan customs union equilibria are essentially identical. This is the content of the following proposition.

Proposition 4. *The equilibria arising from a conditional Pareto optimal trading club and a Kemp-Wan customs union are essentially identical. They have the same equilibrium values for utilities, prices, consumptions, productions, trades and net incomes. They differ only in that member countries have potentially different tariff revenues and transfer payments.*

Proof. (i) Let the conditionally Pareto optimal trading club equilibrium for domestic prices and club utilities be (p^M, u^M, b^M), where $u^M = (u^{kM}, k \in K^M)$ and $b^M = (b^{kM}, k \in K^M)$, when (p_0, x_0^M) is the given world price and external trade vectors. This equilibrium satisfies equation system

$$\sum_{k \in K^M} S_p^k(p^M, u^{kM}) = x_0^M \tag{13}$$

$$p_0^\intercal S_p^k(p^M, u^{kM}) = b^{kM},\ k \in K^M \tag{14}$$

$$\sum_{k \in K^M} b^{kM} = 0, \tag{15}$$

comprising the club market equilibrium conditions, budget and transfer constraints. Disaggregate the net export vectors $x^k \equiv S_p^k(p^M, u^{kM})$ into internal club and external trade vectors such that $x^k = x^{kM} + x^{kN}$ and $\sum_{k \in K^M} x^{kM} = 0$, assuming that internal trades take precedence over external trades and define $\beta^k = b^{kM} + t^{M\intercal} x^{kM}$, $k \in K^M$, where $t^M \equiv p^M - p_0$ is the club's common tariff vector. It is straightforward to show that the trading club equilibrium satisfies the system

$$\sum_{k \in K^M} S_p^k(p^M, u^{kM}) = x_0^M \tag{16}$$

$$p^{M\intercal} x^{kM} + p_0^\intercal x^{kN} = \beta^k,\ k \in K^M \tag{17}$$

$$\sum_{k \in K^M} \beta^k = 0, \tag{18}$$

which are the equilibrium conditions for a Kemp-Wan customs union consisting of the same members as the trading club (i.e., $K^U \equiv K^M$). Thus, when the transfers are adjusted to $\beta^k = b^{kM} + t^{M\intercal} x^{kM}$, $k \in K^M$, the conditional Pareto optimal trading club equilibrium may be interpreted as an equivalent Kemp-Wan customs union equilibrium for the same countries with the same external (world) price. The utility levels, net exports and domestic prices are the same; the only difference is in the transfers needed to equate incomes in the two regimes.

(ii) By a similar argument, a Kemp-Wan customs union equilibrium (denoted by superscripts U) may be re-interpreted as a conditional Pareto optimal trading club equilibrium, by an adjustment of the transfers to $b^k = \beta^{kU} - t^{U\intercal} x^{kU}$, $k \in K^U \equiv K^M$, where $t^U \equiv p^U - p_0 = t^M$ is the club's common external tariff vector.

Together (i) and (ii) establish the essential (in all respects except for the values of the tariff revenues and transfers) equivalence between a conditional Pareto optimal trading club and a Kemp-Wan customs union. ■

The following argument is rather heuristic interpretation of the above proof. The

Kemp-Wan customs union maintains the world price vector at p_0 (and, hence, the external trade vector at x_0^U) by setting a common external tariff vector t^U and by imposing internal free trade, while the conditionally Pareto optimal trading club also maintains the world price vector at p_0 (and, hence, the external trade vector at $x_0^M = x_0^U$) by setting a common tariff $t^M \equiv t^U$. Since, by assumption, both the union and the club impose the same tariff vector (external tariff vector for the union and the non-discriminatory tariff vector for the club), they will have the same domestic price vectors. Moreover, since the domestic prices are the same in the two regimes, each member country has the same net exports in the two regimes and, hence, market equilibrium occurs in both regimes, provided that the same utility values occur. This requires each country to have the same income under the two regimes. But will they? The fact that the customs union imposes no tariffs on internal trade while the members of the trading club do via their non-discriminatory tariff policies suggests that incomes might well be different. Certainly, this argument shows that it will generally (except in very special cases) be the case that tariff revenues are different under the two policy regimes. in the case of a trading club, internal trade in tennis balls, for example, might involve an import duty on imports into country A from country B, but the common tariff vector for the club therefore involves an export subsidy of exactly the same amount in country B. In aggregate, these trade taxes cancel for the club, but at the country level the government of A gets revenue while that of B loses revenue. In the case of a customs union, there is no revenue accruing from internal trade. It would appear, then, that household incomes would differ in the two regimes - union and club.

However, both the union and the trading club are assumed to have a full set of income transfers at their disposal. Transfers may be determined to neutralize the

tariff revenue effects and thereby to ensure that household incomes will be the same in the two regimes, hence ensuring the equivalent of the two equilibria. In the above example, the tariff revenue received by country A from its imports of tennis balls from B can be deducted from its overall receipt of income transfers as a trading club member, while country B can be compensated for its export subsidies on tennis balls trade with A by having its overall transfer income as a trading club member increased. If these transfers are undertaken, each trading club member will have exactly the same income as would accrue to it as a member of a Kemp-Wan customs union. Accordingly, the trading club equilibrium can be re-interpreted as a Kemp-Wan customs union equilibrium.

This heuristic argument may also be adapted to show that an equilibrium for a Kemp-Wan customs union may be re-interpreted as an equilibrium for a conditionally Pareto optimal trading club. Again, transfers can be adjusted to ensure that union members' incomes can be consistent with the re-interpretation as trading club members. The arguments, taken together, establish that the two equilibria are essentially identical: they have the same utility, price, consumption, production and trade vectors but members have different tariff revenues and transfers (that yield the same net incomes) in the two regimes.

Accordingly, it has been shown in Proposition 4 that a conditionally Pareto optimal trading club equilibrium can be interpreted as being an equilibrium for a Kemp-Wan customs union, the only difference being in the levels of the tariff revenues and required transfers. Apart from being of interest in its own right, this result provides the basis for an interesting and novel interpretation of the Kemp-Wan customs union. Propositions 1-4 show, under mild assumptions, that a trading club can yield strict Pareto improvements in welfare for its members, that a sequence of discrete strict

Pareto improving reforms is possible and that such a sequence ceases once domestic prices are equal up to a factor of proportionality. That limiting equilibrium is not only conditionally Pareto optimal for the club, but, by Proposition 4, it is essentially equivalent to the Kemp-Wan customs union of the same members. Thus, these propositions provide an alternative path to a Kemp-Wan customs union to that provided by Kemp and Wan (1976). The Kemp-Wan customs union can be regarded as the limiting case of a sequence of small discrete strict Pareto improvements undertaken by a non-discriminatory trading club.

One might argue, of course, that, since a conditionally Pareto optimal trading club is essentially identical to a Kemp-Wan customs union, a trading club may as well simply become a Kemp-Wan customs union. While this argument has validity, there are several advantages to it remaining as a trading club. First, the trading club may not wish, for political or other reasons, to become a union. Second, the trading club is able to maintain its non-discriminatory trade policy stance and so is able to be consistent with WTO most-favoured-nation principles. Third, the trading club might wish to undertake limited rounds of reforms and hence stop well short of attaining conditional Pareto optimality, although this would be at a welfare cost to its members. For these reasons, our modelling of the trading club seems useful.

5. Conclusions

The literature on preferential trading arrangements is one of the oldest, most extensive and highly controversial in international trade. One of the few contributions that cut through the complexity of the issues involved was the Kemp-Wan proposition on the formation of customs unions. The proof of that proposition was merely based on the application of the second theorem of welfare economics and, as such, it was ingenious — no particular structure was imposed other than adhering to the perfectly

competitive Arrow-Debreu model.

Here we do a less ingenious thing: we apply tools of differential tariff reforms and examine the welfare implications of a trading club moving along a path of non-discriminatory tariff reform that keep world prices unchanged. In doing so, we prove several interesting propositions. First, we prove that our trading club can perform such a coordinated non-discriminatory tariff reform, accompanied with intra-club transfers, that improves the welfare of each of its members without hurting the rest of the world. Second, we show that a sequence of such non-discriminatory, Pareto-improving, tariff reforms exists while ever the domestic prices of club members are different. Third, such a sequence will eventually lead to an equilibrium where member countries face the same domestic prices, but which are *not* necessarily characterized by zero internal tariffs. We call this equilibrium an optimal trading club. Fourth, it is shown that this optimal trading club is equivalent (in welfare, prices, consumption, production and trade, but not in transfers and tariff revenues) to a Kemp-Wan customs union.

Our results lead to interesting interpretations of the Kemp-Wan customs union. First, as discussed further above, the Kemp-Wan customs union may be interpreted as the limiting case of a sequence of small discrete strict Pareto improving reforms by a trading club that employs a Kemp-Wan-like mechanism for tariff reforms. A second interpretation is suggested by our proposition on the essential equivalence of conditionally Pareto optimal trading club and Kemp-Wan customs union equilibria. Specifically, the equivalence result highlights something that was not explicitly clear, viz. that the main element of a Kemp-Wan customs union, apart from the Kemp-Wan mechanism for common external tariff choice, is the existence of intra-club transfers and not the choice of free internal trade.

Our results further suggest that there are interesting, welfare-improving trading arrangements, other than the usual preferential trading arrangements, that deserve more attention. Indeed, this is the kind of attention that APEC's open regionalism concept received in the 1990s. As mentioned in the introduction, APEC constitutes an example of a regional trading arrangement based on non-discriminatory trade practices. It is actually the first, and only, regional arrangement that promotes the concept of open regionalism, by which is meant coordinated trade liberalization by members that is non-discriminatory and therefore consistent with the most favoured nation principle of GATT. While its unconditional MFN treatment was unambiguous at its inception point in 1989, it was quickly perceived as an unrealistic path to follow.[23] In particular, it was thought to induce free-riding behaviour by the non-member countries, who will benefit from APEC's trade liberalization and will therefore have reduced incentives to liberalize their trade. The concept of conditional MFN treatment, i.e. negotiated trade liberalization based on reciprocity, was then put forward as a more operational definition of open regionalism (Bergsten, 1997).

Conditional MFN treatment is in principle what the WTO promotes through its multilateral negotiations and, perhaps because of this, the original concept of open regionalism through APEC may have lost some of its pioneering spirit. Our model of a trading club that adopts the mechanism initiated in Kemp and Wan's model of customs union formation constitutes a particular unconditional MFN tariff reform - one that by-passes the free-riding problem referred to above and thus perhaps helps (theoretically, at least) to return to open regionalism its initial spirit. By designing the tariff reform in a way that keeps world prices at their pre-club levels, we keep the welfare of non-members unchanged and therefore remove this possible incentive

[23] See Elek (1991) for a detailed account of the emergence of APEC and its guiding principles.

for free-riding. Our formulation of open regionalism, i.e. a non-discriminatory tariff reform that keeps world prices fixed, can therefore be seen as justifying a truly "unconditional MFN" form of open regionalism.

An issue that then arises is whether our particular tariff reform violates other WTO rules. Throughout the paper we have been very careful in referring to tariff reform rather than tariff liberalization. By constraining the club members' tariff reforms to ensure that world prices are unchanged, the required reforms may require some tariffs to rise and some to fall and, indeed, some trade tax rates may have to be negative (export subsidies). In this sense, the trading club members' tariff reforms may be in conflict with the written rules of the WTO. While this may be true, the tariff reforms undertaken by our trading club are, arguably, not in conflict with the spirit of the WTO rules, which is that non-participants of a new trading arrangement should not be harmed. As long as our trading club tariff reforms produces weak Pareto gains to the world community, it is therefore difficult to criticize it for being against the spirit of the WTO.[24]

In terms of economic policy implications, our results may be interpreted as emphasizing the value of coordinated tariff reforms, even if these reforms are taken only by a subset of countries and not the whole world. Open regionalism, in the form of our non-preferential trading clubs, is Pareto improving for the world.

[24]Naturally, similar remarks can be made for the original Kemp-Wan proposition on the formation of Pareto improving customs unions. Even if the Kemp-Wan customs union pursues discriminatory tariff practices, and even if keeping world prices at their pre-club level may demand the imposition of export subsidies, it is hard to argue that such polices should not be pursued because they conflict with WTO rules. On a different note, our results do not support the requirement in Article XXIV for complete free internal trade in preferential trading arrangements, provided transfers between members exist and are used appropriately.

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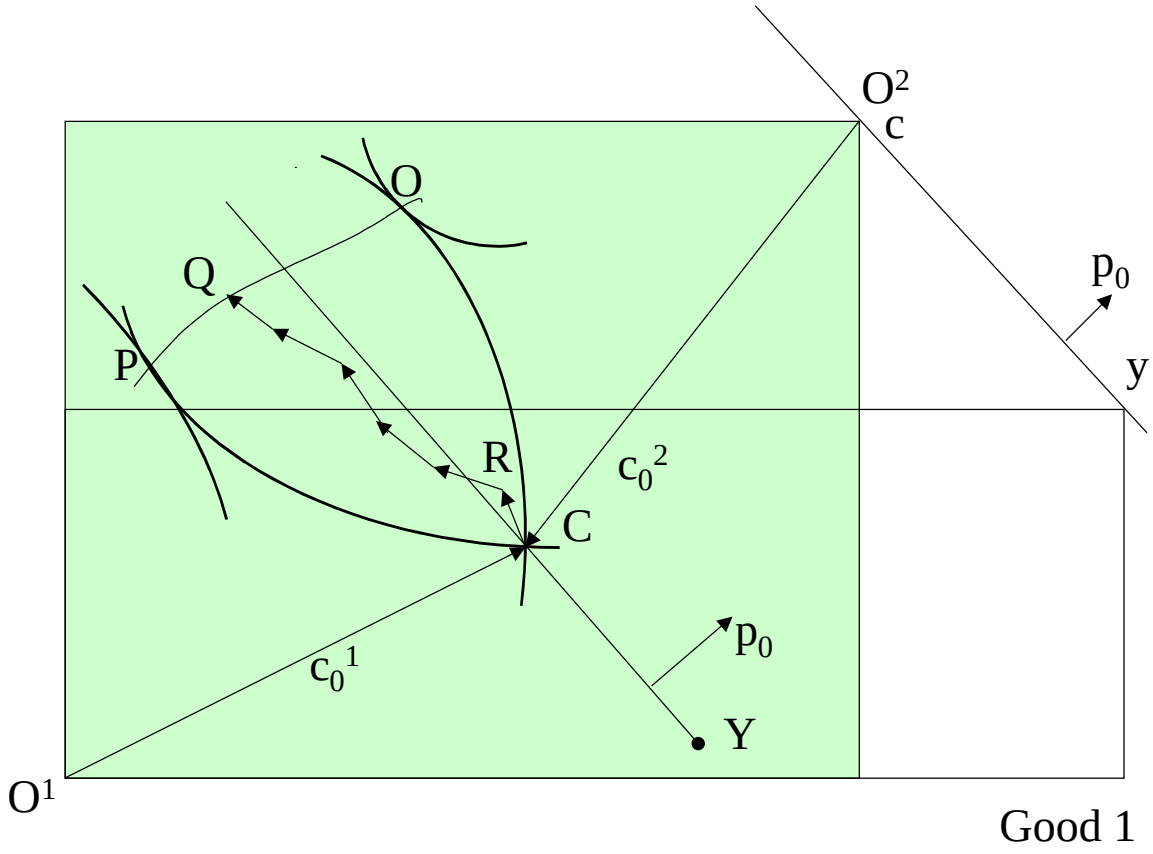

Figure 1: SPI Transition of Club to Conditional Pareto Optimality

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