Regionalism as a Path to Free Trade

Monika Mrázová[*][†][‡]

University of Geneva, University of Surrey, CEP (LSE), and CEPR

July 30, 2015

Abstract

This paper analyses endogenous customs union (CU) and free trade area (FTA) formation in an oligopolistic setting with differentiated products. For both a CU and an FTA, it derives explicitly an 'Ohyama-Kemp-Wan' (OKW) external tariff such that non-members are not being hurt by trade bloc formation. It shows how this tariff depends on the degree of competition within the trade bloc and on governmental political preferences, and it provides conditions under which the welfare of trade bloc members improves. Under these conditions, trade blocs form a path to free trade.

KEYWORDS: Customs union, free trade area, common external tariff, Kemp-Wan theorem, trade liberalization, GATT/WTO.

JEL CLASSIFICATION NUMBERS: F02, F13, F15.

[*]Address for correspondence: Geneva School of Economics and Management (GSEM), University of Geneva, Bd. du Pont d'Arve 40, 1211 Geneva 4, Switzerland; e-mail: monika.mrazova@unige.ch; URL: http://www.monikamrazova.com

[†]This work has been supported by the Fondation de Famille Sandoz under the "Sandoz Family Foundation - Monique de Meuron" Programme for Academic Promotion and the Economic and Social Research Council [grant number PTA-026-27-2479]. Financial support for travel from the George Webb Medley Fund, Balliol College and Oriel College, Oxford, is also gratefully acknowledged.

[‡]Thanks to be added.

1 Introduction

The multilateral trade negotiations are stalling while regionalism is once again afoot. This trend has stimulated new interest in regionalism among the profession. However regionalism is not at all a new topic in economic literature. By showing that customs unions (CUs) can reduce the welfare both of outsiders and union members through trade diversion, Viner (1950) started an important strand of research. Academic interest in regionalism has been periodically revived by surges of regional initiatives: first in the late 1950s and 1960s and second again in the late 1980s and 1990s. The first wave of regional attempts (called 'First Regionalism' by Bhagwati (1991) or 'Old Regionalism' by Ethier (1998)), did not in the end, except in Western Europe, lead to the actual formation of many blocs. By contrast the second wave of regionalism ('Second Regionalism' or 'New Regionalism') was far more successful and it is now said that almost every country is a member of at least one bloc. As Baldwin (2006) points out: "regionalism is here to stay."

One of the current pressing questions regarding preferential trade agreements (PTAs) is how to multilateralise them?[1] In opening a conference on "Multilateralising Regionalism" on 10 September 2007 in Geneva, Director-General Pascal Lamy asked: "what the WTO might do to help avoid a situation in which these negative aspects of regional agreements prevail, and ultimately to promote multilateralisation." One of the most frequent suggestions is to revise the WTO rules governing PTA formation.[2] As Pascal Lamy pointed out: "we should not forget that we have a negotiating mandate under Doha to look at the WTO rules governing regionalism. [. . .] if we are concerned about the impact of burgeoning regionalism we should redouble our efforts here as well."

The rules governing the creation of PTAs are mainly contained in Article XXIV of the GATT. The two principal features of this article are: first, the barriers to trade imposed by the created regional agreement should not be more restrictive than the *general incidence* of the barriers imposed by the constituent countries before the formation of the union, and second, barriers to trade within the union should be eliminated with respect to *substantially all the trade*.

It has been suggested that the requirements of going all the way down to free trade within

[1] The term PTA usually designates both CUs and free trade areas (FTAs). In both of these agreements, members coordinate on the removal of internal barriers, but members of a CU coordinate on setting a common external tariff whereas members of a FTA each choose their external tariff individually.

[2] For other suggestions on how to multilateralise regionalism see for example Baldwin (2006).

the union and not raising barriers on non-members were meant to make PTA formation difficult (see for example Bhagwati (1991) or Srinivasan (1997)), but as various scholars have noted, because of its vagueness, Article XXIV has had little impact on the formation of PTAs. Most PTA formations did not respect it. As a former Deputy Director-General of the GATT, cited by McMillan (1993), said: "of all the GATT articles, this is one of the most abused, and those abuses are among the least noted." The agreement concluding the Uruguay Round of multilateral trade negotiations included an "Understanding on the interpretation of Article XXIV of the GATT" which partially clarified the meaning of Article XXIV, but as studies by for example Syropoulos (1999), Goto and Hamada (1999) and Mrázová, Vines, and Zissimos (2009) show, even if Article XXIV was respected, it would not be sufficient to prevent the harmful trade diversion of regional bloc formation. So the revision of Article XXIV continues to be of interest.

Proposals for reform of Article XXIV are usually related to what is often described as one of the most elegant results in international economics, namely the finding by Ohyama (1972) and Kemp and Wan (1976) that a CU formed by any arbitrary subset of countries can always be designed is such a way as to be a Pareto improvement.[3] Kemp and Wan's proof of this result is beautifully concise. The external trade vector of the CU is frozen at the pre-union level so outsiders are indifferent to the union formation. When all the internal barriers in the union are removed, the resulting competitive equilibrium is Pareto-superior and so, with lumpsum transfers, each member of the union can be made better off. The difference between the pre-union world price vector and the intra-union price vector yields the vector of common external tariffs of this welfare-enhancing CU.

This finding, that it is possible for a PTA to avoid harm to outsiders while improving members' welfare, motivates attempts to reform Article XXIV. However, there is one difficulty: the Ohyama-Kemp-Wan (henceforth OKW) proposition is an existence result only and gives no guidance on the level of the common external tariff of the welfare-improving CU. McMillan (1993) suggested revising Article XXIV's requirements in terms of trade volumes instead of in terms of tariffs. A CU would be 'GATT-admissible' if it did not reduce the volume of imports into the CU. This approach has been criticised by Winters (1997) among others, mainly for being an ex post rather than an ex ante criterion. Bhagwati (1991) proposed that Article XXIV should require the common external tariff of a CU to be set at

[3]This result is mostly known as the Kemp-Wan theorem, but has been shown by several authors. Baldwin and Venables (1995) and Baldwin (2008) trace it back to Meade (1955).

the minimum of the pre-union tariffs of the member countries. Srinivasan (1997) showed that such a requirement could harm union members. This paper, on the other hand, will show that such a requirement may not be sufficient to avoid outsiders being made worse off by CU creation. Other authors have explored the OKW tariff structure. Srinivasan (1997) characterised the OKW tariff as a weighted average of the pre-union tariffs.[4] Neary (1998) characterised a sequence of OKW tariff changes.

This paper extends the existing theory by relaxing the assumption of perfect competition. Indeed, the assumption of perfect competition is crucial in the original Kemp and Wan (1976) existence proof and most attempts to characterise the OKW tariff structure have retained this assumption. An exception is Van Long and Soubeyran (1997) who show in a model with homogeneous oligopolists that under certain assumptions the formation of a CU can be Pareto-improving. This paper extends this result to a model with differentiated goods where it shows the existence of OKW tariff and explicitly derives it. Thanks to the extension to differentiated goods, it is possible to show how the OKW tariff depends on the degree of competition: the more competitive a market is, the larger the potential trade diversion of the CU and the lower is the OKW tariff. The paper further explores the characteristics of the OKW tariff under various circumstances and, based on this analysis, it suggests a direction for reform of Article XXIV of the WTO.

The remainder of this paper proceeds as follows. Section 2 presents the basic underlying oligopolistic model of intra-industry trade and endogenous CU formation process. Section 3 derives the OKW tariff of a CU and shows how it depends on the degree of competition in the union. Section 4 explores the structure of the OKW tariff of a merger of two asymmetric CUs. Section 5 shows existence and explicitly derives an OKW tariff change à la Neary (1998) for the oligopolistic case. Finally, the sensitivity of the OKW tariff is analysed in Section 6. Section 7 concludes.

2 The model

The model used to analyse CU formation is a Brander (1981) type oligopolistic model derived by Yi (1996). This section summarises the key characteristics and results of Yi's (1996)

[4] Srinivasan (1997) derived the explicit formulation of the OKW tariff for two examples of a Ricardian model with Cobb-Douglas preferences. In a more general case of perfect competition, taking prices as exogenous, he shows that the OKW tariff can be both above or below the weighted average of pre-union tariffs.

model.[5]

2.1 Preferences and technology

There are N countries in the world indexed by $i = 1, \ldots, N$. Each country has one firm producing one good. Consumers in country i have quasilinear-quadratic preferences of the form

$$u(\mathbf{q}_i, M_i) = v(\mathbf{q}_i) + M_i = aQ_i - \frac{1}{2}\left[\gamma Q_i^2 + (1-\gamma)\sum_{j=1}^{N} q_{ij}^2\right] + M_i \tag{1}$$

where q_{ij} is country i's consumption of country j's product, $\mathbf{q_i} = (q_{i1}, q_{i2}, ..., q_{iN})$ is country i's consumption profile, $Q_i \equiv \sum_{j=1}^{N} q_{ij}$ and M_i are country i's consumption of the differentiated and numeraire good respectively. The numeraire good is transferred internationally to settle the balance of trade and, by assumption, all countries are endowed with sufficient quantities of the numeraire good to guarantee positive consumption in equilibrium. The parameter γ is a substitution index between goods which ranges from 0 (goods are independent) to 1 (the good is homogeneous); as γ rises, goods become closer substitutes. Consumers have a taste for variety; for any given Q_i, the more balanced the consumption bundle is, the higher the utility. Maximising utility, country i's inverse demand function for country j's good is

$$p_{ij} = a - (1-\gamma)q_{ij} - \gamma Q_i = a - q_{ij} - \gamma \sum_{\substack{k=1 \\ k \neq j}}^{N} q_{ik} \tag{2}$$

There are no transportation costs in this model. Countries impose specific tariffs on imports from other countries, τ_{ij} denotes country i's tariff on imports from country j. All firms produce at the same constant marginal cost c. Country j's effective marginal cost of exporting to country i is $c_{ij} = c + \tau_{ij}$. Markets are assumed to be segmented and so firms compete by choosing quantities in each country. In country i, country j's firm will solve $\max_{\{q_{ij}\}} \pi^{ij} = (p_{ij} - c_{ij})q_{ij}$. The first order condition for this maximisation problem is

$$p_{ij} - c_{ij} - q_{ij} = 0 \tag{3}$$

In the Cournot equilibrium,

[5] For further details see Yi (1996). For other variations of this model in different contexts see for example Krishna (1998) and Freund (2000).

$$Q_i = \frac{N - T_i}{\Gamma(N)} \quad \text{and} \quad q_{ij} = \frac{\Gamma(0) + \gamma T_i - \Gamma(N)\tau_{ij}}{\Gamma(0)\Gamma(N)} \tag{4}$$

where $\Gamma(.)$ is defined as $\Gamma(k) = 2 - \gamma + k\gamma$; T_i is the sum of tariffs imposed by country i on all imported goods $T_i = \sum_{j=1}^{N} \tau_{ij}$; and where I have normalised $a - c = 1$. $\Gamma(k)$ can be interpreted as a measure of market competition in a CU of size k. The higher γ (the more goods are substitutable) and the higher k (the more firms there are), the higher the degree of competition. Note that $\Gamma(N) = 2 - \gamma + N\gamma$ represents the degree of competition in free trade (all firms compete symmetrically), $\Gamma(1) = 2$ is the case of monopoly. When goods are independent in demand, $\gamma = 0$, $\Gamma(k) = 2$, and we have the monopoly case. $\Gamma(0) = 2 - \gamma$ represents the degree of competition in monopoly less the marginal contribution of one firm.

The equilibrium quantities have standard properties. If country i increases its tariff on imports from country j, then the consumption of imports from country j and the total consumption in country i will fall, but the consumption of all other goods will increase. Furthermore, firm j's equilibrium export profit to country i can be obtained using the first order condition (3)

$$\pi^{ij} = (p_{ij} - c_{ij})q_{ij} = q_{ij}^2 \tag{5}$$

so we can also note that when country i increases its tariff on imports from country j, then export profits of country j's firm to country i fall and home firm's profits and all other firms' export profits to country i rise.

There will be two sources of gains from trade in this setting: increased variety of goods and reduced market power of domestic industry.

2.2 CUs and optimal tariffs

Country i's welfare W^i is the sum of domestic consumer surplus (CS^i), the domestic firm's profit in the home market (π^{ii}), tariff revenue (TR^i), and the domestic firm's export profits ($\sum \pi^{ji}$, $j \neq i$). The countries that form a CU are assumed to abolish tariffs among union members and set a common external tariff to maximise the aggregate welfare of members. If countries $1, ..., k$ belong to a CU of size k, they will choose their common external tariff to solve

$$\max_{\{\tau_{ij}\}_{i=1,\ j=k+1}^{k,\ \ N}} \sum_{i=1}^{k} W^i = \sum_{i=1}^{k} \left\{ CS^i + \pi^{ii} + TR^i + \sum_{\substack{j=1 \\ j \neq i}}^{N} \pi^{ji} \right\} \tag{6}$$

where $\tau_{ij} = 0$, for $i = 1, ..., k$, $j = 1, ..., k$. Yi (1996) shows that the unique optimal common external tariff of a CU of size k is

$$\tau_e(k) = \frac{\Gamma(0)\Gamma(2k)}{D(k)} \tag{7}$$

with $D(k) = \Psi(k)\Gamma(N) + \Gamma(k)\Gamma(2k)$ and $\Psi(k) = [\Gamma(0) + 1]\,\Gamma(k) - \Gamma(2k)$. Note that, in this model, the optimal tariff of a CU of size k depends *only* on k, N and γ; it does not depend on the tariffs set by the rest of the world. This property is a consequence of the assumptions of segmented markets, quasilinear preferences and constant marginal cost. As a CU expands, its external tariff varies with its size in a non-monotonic way depending on the parameters γ and N: it may initially increase, but ultimately decreases. This non-monotonicity results from γ's impact on competition and from two opposing effects of CU formation on the optimum tariff: a market power effect and a trade diversion effect.[6] Figure 1 below illustrates the variations of the Nash equilibrium tariff.

2.3 Welfare implications of CU formation

Given the fact that the Nash equilibrium tariff of a CU is only a function of the number of its members, using (4), we can now characterise the equilibrium sales in a country belonging to a CU of size k. Denote the sales of a member (*Insider*) country by $q_I(k)$

$$q_I(k) = \frac{\Gamma(0) + (\Gamma(N) - \Gamma(k))\tau_e(k)}{\Gamma(0)\Gamma(N)} \tag{8}$$

the sales of a non-member (*Outsider*) country by $q_O(k)$

$$q_O(k) = \frac{\Gamma(0) - \Gamma(k)\tau_e(k)}{\Gamma(0)\Gamma(N)} \tag{9}$$

and the total consumption in a country belonging to a size$-k$ CU by $Q(k)$

$$Q(k) = \frac{N - (N-k)\tau_e(k)}{\Gamma(N)} \tag{10}$$

[6] For a detailed discussion of the variations of the Nash tariff see Yi (1996) or Mrázová, Vines, and Zissimos (2009).

As all countries are symmetric, each CU can, with a slight abuse of notation, be identified with its size. The CU structure, which is a partition of the set of the countries, can thus be written as $C = \{k_1, k_2, \ldots, k_m\}$ where k_i is the size of the kth union. Since all members of a CU have the same level of welfare, the welfare of a country belonging to a size-k CU in a given CU structure is denoted $W(k; C)$. Yi (1996) shows that the welfare of a member of the size-k_i CU in $C = \{k_1, k_2, ..., k_m\}$ is given by

$$\begin{aligned} W(k_i; C) = Q(k_i) - \frac{\gamma}{2}Q(k_i)^2 - \frac{1-\gamma}{2}\left\{k_i\left[q_I(k_i)\right]^2 + (N-k_i)\left[q_O(k_i)\right]^2\right\} \\ + \sum_{\substack{j=1 \\ j\neq i}}^{m} k_j q_O(k_j)^2 - (N-k_i)\left[q_O(k_i)\right]^2 \end{aligned} \tag{11}$$

where the first line gives the net benefits from consumption and the second line equals the export profits of the domestic firm in non-member countries minus non-member countries' profits in the home market.[7]

Because non-member countries are only affected by the formation of a CU through their export profits to the CU, from (9), Yi (1996) shows that Nash-optimal CU formation and expansion makes non-members unambiguously worse off ($dq_O(k)/dk \leq 0$). Furthermore, Yi (1996) shows that the expansion of a CU improves the aggregate welfare of existing and new members, but not necessarily the individual welfare of all members.

2.4 Endogenous CU formation and stable CU structures

Yi (1996) models CU formation as an infinite-horizon sequential-move 'coalition unanimity game'. In this game, also called 'unanimous regionalism' game, a CU forms if an only if all potential members agree to form the union.[8] To characterise the equilibrium CU structure of this game, Yi (1996) uses a result established by Bloch (1996): the unanimous regionalism game yields the same stationary subgame perfect equilibrium coalition structure as the following 'size-announcement game'. Countries are placed on a list. Country 1 starts the game by choosing the size of the CU that it would like to form, e.g. k. Then the first

[7] See Furusawa and Konishi (2004) for a general derivation of such a decomposition.

[8] In this game, countries are ordered. The first country starts the game by proposing the formation of a CU to which it belongs. Then each prospective member is asked in turn to agree or disagree. If a proposed CU partner rejects the proposal, it has to propose another CU to which it belongs. If all prospective members agree, the CU forms and its member countries withdraw from the game. Then the first country among the remaining countries starts a new stage of the game by making a proposal.

k countries form a size-k CU and withdraw from the list. Then country $k+1$ announces the size of the CU it would like to form, and so on until N is reached. Bloch (1996) shows that this size announcement game has a (generically) unique subgame perfect equilibrium coalition structure.

Yi (1996) shows that this CU formation game leads to an asymmetric CU equilibrium structure with at most three CUs. Free trade is the equilibrium outcome only for a very limited range of parameters: for very small values of the substitution index γ. The intuition behind this result is that, when γ is small, competition in varieties is weak and the static efficiency gains of free trade outweigh the terms-of-trade benefits that would arise under CU formation even for a large CU. Thus there is a strong incentive for countries to go to free trade. But for most parameter values, free trade is not the equilibrium outcome. Most of the time, the CU formation game leads to two or three blocs of different size. World welfare is lower in these cases than under free trade.

2.5 CUs and Article XXIV-constrained tariffs

Mrázová, Vines, and Zissimos (2009) study the same CU formation game with the WTO Article XXIV constraint. This constraint prevents countries from raising their tariffs when forming a bloc. Mrázová, Vines, and Zissimos (2009) show that even with the WTO Article XXIV constraint CU formation makes non-members worse off. Article XXIV makes CU formation less attractive and slightly increases the range of the parameter γ for which free trade is the equilibrium outcome. But when free trade does not arise in equilibrium, which still happens for most parameter values of γ, the Article XXIV constraint may even reduce world welfare.

3 CU formation and OKW tariffs

More than thirty years ago, Ohyama (1972) and Kemp and Wan (1976) showed that, under the assumption of perfect competition, a CU between any subset of countries can be designed to leave non-member countries indifferent to its creation and to make member countries better off. In this section, I derive explicitly an OKW tariff in the oligopolistic model of the present paper. I show that when CUs set OKW tariffs, CU formation does not harm outsiders and makes insiders better off. The consequence of this is that the CU formation process described in Subsection 2.4 leads to free trade.

3.1 OKW tariffs in the oligopolistic model

Definition 1. An OKW tariff τ_{KW} is a common external tariff of a CU such that it keeps trade with non-members equal to the pre-union levels.

Proposition 1. *The OKW tariff of a member of a customs union of size k is proportional the pre-union tariff and inversely proportional to the degree of competition in the union.*

Proof. Exports from CU members to non-members do not depend on the CU tariff so they are not affected by the CU formation. CU formation affects the welfare of non-members only through their exports to the CU. By definition, the OKW tariff keeps the exports of non-members into the union constant. Thus we have

$$\frac{\Gamma(0) - \Gamma(k)\tau(k)}{\Gamma(0)\Gamma(N)} = q_O(k) = q_O(1) = \frac{\Gamma(0) - \Gamma(1)\tau_e(1)}{\Gamma(0)\Gamma(N)}$$

rearranging terms yields

$$\tau_{KW}(k) = \frac{\Gamma(1)}{\Gamma(k)}\tau_e(1) = \frac{2}{2 + (k-1)\gamma}\tau_e(1) \tag{12}$$

□

The OKW tariff is a decreasing function of the degree of competition, because the higher the degree of competition (the larger the CU and the larger the substitution index between goods), the harder it is for outsiders to export to the union and the more important is the potential trade diversion created by the CU and so the lower the OKW tariff. Figure 1 illustrates the variations of the OKW tariff with the size of the CU and shows how this tariff is different from the unconstrained Nash equilibrium tariff or the Article XXIV-constrained tariff.[9]

Proposition 2. *For any k, γ and N, $\tau_{KW}(k) \leq \tau_e(k)$ and $\tau_{KW}(k) \leq \tau_{WTO}(k)$.*

Proof.

$$\begin{aligned}
\tau_e(k) - \tau_{KW}(k) &= \frac{\Gamma(0)\Gamma(2k)}{D(k)} - \frac{\Gamma(1)}{\Gamma(k)}\frac{\Gamma(0)\Gamma(2)}{D(1)} \\
&= \frac{\gamma(k-1)\Gamma(0)\Gamma(N)}{\Gamma(k)D(1)D(k)}\left[\Gamma(0)\Gamma(2) + 2\Gamma(k)(4-3\gamma)\right] \geq 0
\end{aligned}$$

[9] Note that when $\gamma = 1$, the OKW tariff reduces to the expression derived by Van Long and Soubeyran (1997). Note also that the OKW tariff derived here is such that the pre-union trade is determined by Nash equilibrium tariffs, but this is not necessary. The OKW tariff would have the same form as 12 for any level of a symmetric initial tariff.

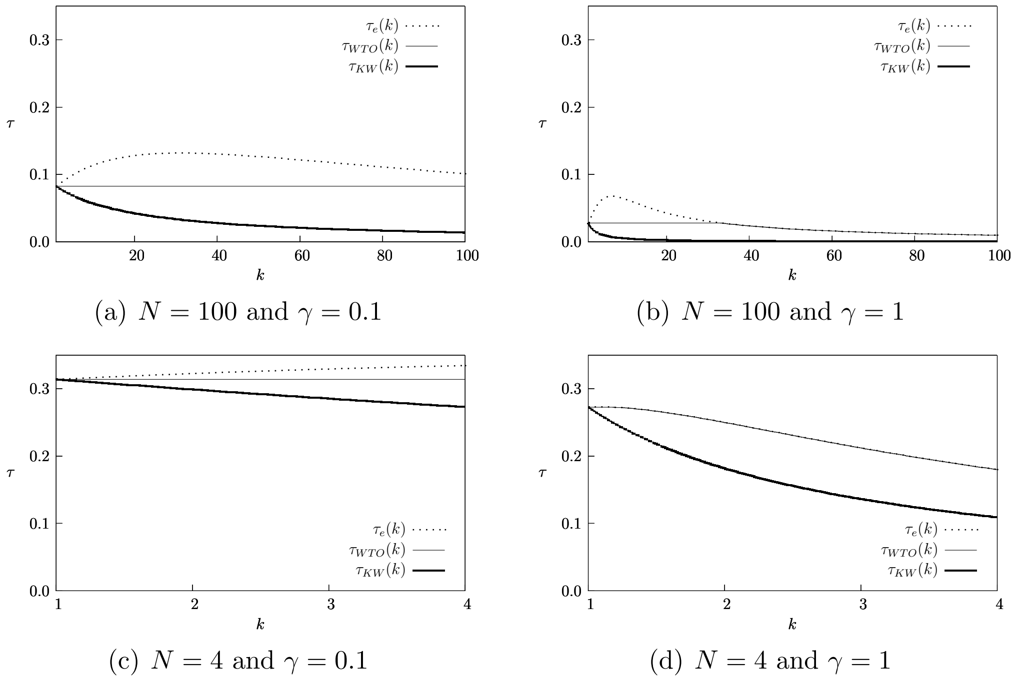

Figure 1: Nash tariff $\tau_e(k)$, Article XXIV-constrained tariff $\tau_{WTO}(k)$ and OKW tariff $\tau_{KW}(k)$ as functions of the CU size for different values of N and γ.

When the Article XXIV constraint does not bind, the WTO-constrained tariff is equal to the Nash equilibrium tariff which is larger than the OKW tariff. When the Article XXIV constraint binds, $\tau_{WTO}(k) = \tau_e(1)$ and $\frac{\Gamma(1)}{\Gamma(k)}\tau_e(1) \leq \tau_e(1)$. $\square$

3.2 OKW tariffs and welfare implications of CU formation

This subsection explores the welfare implications of CU formation when a CU imposes the OKW tariff defined and derived above. The OKW tariff τ_{KW} has been constructed in such a way as to keep trade with outsiders constant. By construction, non-members are thus indifferent to CU formation when the CU sets its common external tariff equal to τ_{KW}. But how does CU formation affect the members of the CU when the union has to set its common external tariff equal to τ_{KW}?

Proposition 3. *The welfare of a member of a CU setting OKW external tariffs monotonically increases with the size of the union.*

Proof. See Appendix A page 18. $\square$

Members unambiguously benefit from the creation and expansion of the CU with OKW tariffs. Note that this is different from the benchmark model of Yi (1996) where CUs set optimal external tariffs to maximise their welfare. In Yi's case, the aggregate welfare of old and new CU members increases, but not necessarily the individual welfare of all members. With OKW tariffs, all members' welfare increases exactly as in the perfectly competitive model of Kemp and Wan (1976).

Corollary 1. *The size-announcement game when CUs set OKW external tariffs leads to free trade.*

As the welfare of a member of a CU setting OKW tariffs increases with the size of the union, the country starting the CU formation game will choose to form a CU with all the countries in the world to maximise its welfare.

4 OKW tariffs and asymmetric CUs

In this section, consider the merger of two existing CUs of size k and s. What should be the OKW tariff of the resulting CU?[10]

Proposition 4. *The OKW tariff of the merger of two CUs is an increasing function of the pre-merger tariffs of the two CUs and is inversely proportional to the size and degree of competition of the resulting CU. It is less than a weighted average of the two pre-union tariffs.*

Proof. The OKW tariff must be such that it keeps trade with outsiders fixed. Thus we must have

$$kq_O(k) + sq_O(s) = (k+s)q_O(k+s)$$

rearranging terms yields

$$\tau_{KW}(k+s) = \frac{k\Gamma(k)\tau_e(k) + s\Gamma(s)\tau_e(s)}{(k+s)\Gamma(k+s)} \tag{13}$$

with $k\Gamma(k) + s\Gamma(s) < (k+s)\Gamma(k+s)$ for $\gamma > 0$.[11]

□

[10] Note that the same reasoning would apply for a CU formed by two countries with different numbers of firms.

[11] When $\gamma = 0$, the Nash equilibrium tariff is a constant and coincides with the OKW tariff.

The OKW tariff of the resulting union being less than a weighted average of the two pre-union tariffs, it may be lower than both of the pre-union tariffs. This result shows that Bhagwati's (1991) proposition for reform of Article XXIV requiring that the common external tariff of a CU to be set at the minimum of the pre-union tariffs of the member countries would not necessarily be sufficient to prevent the harmful trade diversion created by the new union. This result also shows that the Uruguay Round interpretation of Article XXIV which requires the common external tariff of a CU be a weighted average of the pre-union tariffs is also insufficient.

5 Piecemeal CU formation

Section 3 showed that even when industries are oligopolistic, there is a OKW tariff such that CU formation does not harm outsiders and makes the members of the union better off. The CU formation analysed was the standard CU formation considered in the literature: members of the union set all internal tariffs to zero and set a common external tariff. Neary (1998) shows that under perfect competition, there exists a sequence of internal tariff changes ensuring successive Pareto improvements. This section explores this result in the oligopolistic model of the present paper.

5.1 OKW tariff reduction

Definition 2. Assume a group of k countries decide to lower their tariffs among themselves by $d\tau$. The OKW tariff reduction $d\tau_{KW}$ is the reduction in their tariffs with other countries which exactly offsets the tariff reduction $d\tau$ and keeps trade with the other countries constant.

Proposition 5. *Consider a group of k countries which reduce tariff among themselves by $d\tau$. The tariff reduction is OKW if these countries reduce their tariffs on outsiders by*

$$d\tau_{KW} = \left[1 - \frac{\tau_{KW}(k)}{\tau_e(1)}\right] d\tau = \left[1 - \frac{\Gamma(1)}{\Gamma(k)}\right] d\tau \tag{14}$$

Proof. The OKW tariff reduction must keep trade with outsiders constant. Non-members' imports into a country belonging to the group of k countries are

$$q_O(k) = \frac{\Gamma(0) - \Gamma(k)\bar{\tau} + \gamma(k-1)\tau}{\Gamma(0)\Gamma(N)}$$

where τ is the tariff on the countries participating in the partial liberalisation and $\bar{\tau}$ is the tariff on outsiders. Total differentiation yields

$$\Gamma(0)\Gamma(N)dq_O(k) = -\Gamma(k)d\bar{\tau} + \gamma(k-1)d\tau = 0$$

rearranging terms yields (14). □

Note that $0 \leq 1 - \frac{\Gamma(1)}{\Gamma(k)} < 1$, so the members of the union need to lower their external tariffs as they lower their internal ones, but not by as much. Furthermore, the OKW tariff reduction is increasing with the degree of competition in the union. The more competition is created in the union, the larger is the potential trade diversion and so the more the members of the union have to reduce the tariffs on outsiders. Also, the further is the OKW tariff τ_{KW} from the initial tariff τ_e, the larger the OKW tariff reduction has to be. When $\gamma = 0$ and the partial liberalisation does not create any competition, $d\tau_{KW} = 0$ and tariff reduction on outsiders is not necessary. [12]

5.2 Welfare implications of piecemeal CU formation

Once again, by construction, non-members are indifferent to a tariff reduction among the k countries if the group of countries also reduces the tariff on the non-members as characterised in proposition 5. How does such a tariff reduction affect the welfare of the liberalising countries?

Proposition 6. *The members' welfare increases when tariffs are reduced in the OKW way.*

Proof. See Appendix A page 19. □

This result shows that the requirement to remove all internal barriers when a CU is formed is not necessary for a Pareto improvement. It is often argued (see for example Srinivasan (1997)) that Article XXIV's requirement for 100 percent preferences was meant to make CU formation difficult and that integration with 100 percent preferences was in line with the objective of multilateralism (see Bhagwati (1991)). Proposition 6 shows that 100 percent preferences are not necessary, what is essential is how tariffs are being reduced on outsiders.

[12]Note again that to derive the OKW tariff reduction, the pre-liberalisation equilibrium is assumed to be the Nash equilibrium, but the same formula would be valid for any equilibrium with symmetric tariffs.

6 Sensitivity of the OKW tariff

Section 3 showed that when CUs set OKW tariffs, CU formation leads to free trade even in the oligopolistic model of this paper. The interesting question for policy-makers is whether there is a margin of error around the OKW tariffs. We can imagine that, by continuity, it may be possible to set tariffs close to the OKW level and still get free trade in equilibrium of the CU formation game. This section explores this question by examining a stability condition for free trade and through simulations.

6.1 Stability condition for free trade

Definition 3. For all CU structures C and C', $C' = C - \{k\} \cup \{k-1, 1\}$, and all k, $1 \leq k \leq k_0$, k_0 is the largest integer which satisfies $W(k; C) \geq W(k-1; C')$.

k_0 is the largest integer such that any size-k CU, $k \leq k_0 - 1$, becomes better off by merging with a single-country CU. Yi (1996) shows that when CUs form according to the size-announcement game described in subsection 2.4, the second-to-last CU to form has at least k_0 members, because if this was not the case, the members of this union would be better off by accepting one more member (which they could do as there are still some remaining countries in the game).

A necessary condition for free trade to be the equilibrium outcome of the size-announcement game is $W(N; \{N\}) \geq W(N-1; \{N-1, 1\})$. It is also a sufficient condition, because it implies $k_0 = N$. Assume that the CU with $N-1$ members imposes $\alpha\tau_{KW}$ tariff on the singleton country. By studying how the stability condition for free trade $W(N; \{N\}) \geq W(N-1; \{N-1, 1\})$ varies with α, it is possible to derive the following proposition.

Proposition 7. *For any N and γ, there exists an admissible deviation from the OKW tariff such that the CU formation game still leads to free trade. The admissible deviation decreases with the number of countries in the world and the substitution index.*

Proof. See Appendix A page 20. □

Figure 2 illustrates the stability condition for various values of the deviation from the OKW tariff level. Free trade is the equilibrium outcome for the values of N and γ below the curves for different deviations α, confirming the result that the larger deviation the more likely will the tariff reform fail to yield free trade, unless there are few countries and goods are not closely substitutable.

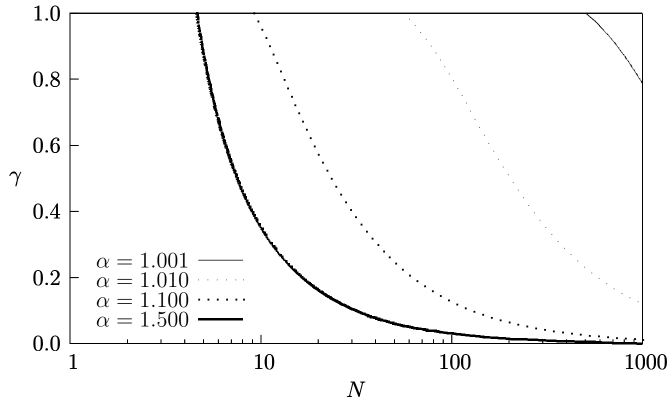

Figure 2: Threshold for free trade for various values of α.

6.2 Simulation results

Simulations described in the Appendix B (page 21) throw further light on the possible deviation from the OKW tariff level. The more countries there are in the world and the greater γ, the less room there is for deviation. The simulations also suggest that, even if free trade is not reached in equilibrium, as long as the tariff of the CUs ($\alpha\tau_{KW}$) is below the Nash equilibrium tariff (τ_e), the equilibrium CU structure is more asymmetric than in the case of Yi (1996) or Mrázová, Vines, and Zissimos (2009). The consequence of the more asymmetric CU structure is that world welfare is higher.[13]

7 Conclusion

This paper has shown the existence of and explicitly derived an OKW tariff for CU formation under oligopoly. A CU formation with such OKW tariffs leaves outsiders indifferent, makes union members better off and hence leads to free trade. It has been shown that the OKW tariff is a decreasing function of the degree of competition. When industries are more competitive (goods are more substitutable and there are more countries in the union), a larger tariff reduction on outsiders is necessary to ensure a Pareto-improving CU formation. Thus imperfect competition makes it easier to achieve the formation of OKW customs unions.

This paper has also shown that the OKW tariffs are always smaller than both the Nash equilibrium tariffs and the Article XXIV-constrained tariffs. When two existing CUs merge,

[13]See Mrázová, Vines, and Zissimos (2009) for a discussion of how world welfare varies with the asymmetry of the equilibrium blocs.

the OKW tariff of the resulting union is less than a weighted average of the pre-merger tariffs of the two unions and so may be below both of these tariffs. These findings indicate that the Uruguay Round re-formulation of Article XXIV, requiring the CU external tariff to be a weighted average of pre-union tariffs, is insufficient.

Finally, this paper has analysed piecemeal CU formation and has shown that the abolition of all internal barriers is not necessary to obtain a Pareto improvement. Marginal tariff reductions among a group a countries can lead to a Pareto improvement as long as these tariff reductions are offset by appropriate tariff reductions on outsiders. The offsetting tariff reductions are an increasing function of the degree of competition within the created union. It is often argued that the Article XXIV requirement for CUs to remove all internal barriers was meant to make CU formation difficult. Also a CU with no internal barriers can be seen from the international trade perspective as a single country and so CU formation with 100 percent preferences was seen as non-disruptive of the multilateral trading system. However, this paper has shown that it does not matter whether preferences are 100 percent or only marginal, what is important is to make sure that outsiders are not hurt by these preferences. Although the model of this paper is highly stylised and one should be careful when drawing policy implications from it, these findings suggest that in revising Article XXIV we should focus our efforts on setting the common external tariff at the appropriate level rather than trying to enforce the requirement of 100 percent preferences.

Appendix

A Proofs

Proof of Proposition 3. Assume that countries are initially singletons and that k countries decide to form a CU. The welfare of this CU is given by

$$W(k) = Q(k) - \frac{\gamma}{2} Q(k)^2 - \frac{1-\gamma}{2}\left\{k\left[q_I(k)\right]^2 + (N-k)\left[q_O(k)\right]^2\right\} - (N-k)\left[q_O(k)\right]^2 + (N-k) q_O(1)^2$$

Treating k as continuous, when the size of the CU increases, the welfare varies

$$\begin{aligned}\frac{dW(k)}{dk} = & \frac{dQ(k)}{dk} - \gamma Q(k)\frac{dQ(k)}{dk} - \frac{1-\gamma}{2}\left[2kq_I(k)\frac{dq_I(k)}{dk} - q_O(k)^2 + 2(N-k)q_O(k)\frac{dq_O(k)}{dk}\right] \\ & + q_O(k)^2 - 2(N-k)q_O(k)\frac{dq_O(k)}{dk} - q_O(1)^2\end{aligned}$$

The OKW tariff is such that non-members' exports into the countries of the union remain constant and so $\frac{dq_O(k)}{dk} = 0$ and $q_O(k)^2 = q_O(1)^2$. Hence

$$\frac{dW(k)}{dk} = \frac{dQ(k)}{dk} - \gamma Q(k)\frac{dQ(k)}{dk} - \frac{1-\gamma}{2}\left[2kq_I(k)\frac{dq_I(k)}{dk} - q_O(1)^2\right]$$

Using (10) and the expression for the OKW tariff (12), we have

$$Q(k) = \frac{N\Gamma(k) - 2(N-k)\tau(1)}{\Gamma(N)\Gamma(k)} \text{ and } \frac{dQ(k)}{dk} = \frac{2\tau(1)}{\Gamma(k)^2} > 0$$

and so

$$\begin{aligned}\frac{dQ(k)}{dk} - \gamma Q(k)\frac{dQ(k)}{dk} = & \frac{2\tau(1)}{\Gamma(k)^2} - \gamma\frac{\left[N\Gamma(k) - 2(N-k)\tau(1)\right]}{\Gamma(N)\Gamma(k)}\frac{2\tau(1)}{\Gamma(k)^2} \\ = & \frac{2\tau(1)\left[\Gamma(0)\Gamma(k) + 2\gamma(N-k)\tau(1)\right]}{\Gamma(N)\Gamma(k)^3} > 0\end{aligned}$$

Furthermore, using (8) and the expression for the OKW tariff (12), we have

$$q_I(k) = \frac{\Gamma(0)\Gamma(k) + 2\gamma(N-k)\tau(1)}{\Gamma(0)\Gamma(N)\Gamma(k)} \text{ and } \frac{dq_I(k)}{dk} = -\frac{2\gamma\tau(1)}{\Gamma(0)\Gamma(k)^2} < 0 \tag{15}$$

and so

$$-\frac{1-\gamma}{2}\left[2kq_I(k)\frac{dq_I(k)}{dk}-q_O(1)^2\right]>0 \qquad (16)$$

Hence $\frac{dW(k)}{dk}>0$. $\square$

Proof of Proposition 5. Consider a country belonging the group of k liberalising countries. Denote by q_{O_i} the exports of this country to a partner liberalising country, by q_{O_o} the exports of this country to a non-partner country, by $q^*_{O_i}$ the exports of a partner country to the country under consideration and by $q^*_{O_o}$ the exports of a non-member country to the country under consideration.

From (11) the welfare of a country belonging to the group of k liberalising countries is

$$\begin{aligned}W=&\,Q(1)-\frac{\gamma}{2}Q(1)^2-\frac{1-\gamma}{2}\left[q_I(1)^2+(N-k)q^*_{O_o}(1)^2+(k-1)q^*_{O_i}(1)^2\right]\\&-(N-k)q^*_{O_o}(1)^2-(k-1)q^*_{O_i}(1)^2+(N-k)q_{O_o}(1)^2+(k-1)q_{O_i}(1)^2\end{aligned}$$

Outsiders do not change their tariffs and the liberalising countries reduce tariffs according to the OKW schedule, so $dq_{O_o}(1)=0$ and $dq^*_{O_o}(1)=0$. Because of symmetry, $q^*_{O_i}(1)=q_{O_i}(1)$. So the change in welfare due to the liberalisation is

$$dW=dQ(1)-\gamma Q(1)dQ(1)-(1-\gamma)\left[q_I(1)dq_I(1)+(k-1)q^*_{O_i}(1)dq^*_{O_i}(1)\right]$$

Denote by τ the tariff that the liberalising countries impose among themselves and by $\bar{\tau}$ the tariff that they impose on outsiders. The tariff reduction is assumed to be OKW $d\bar{\tau}=\frac{\gamma(k-1)}{\Gamma(k)}d\tau$. So we have

$$\begin{aligned}Q(1)&=\frac{N-(N-k)\bar{\tau}-(k-1)\tau}{\Gamma(N)} & dQ(1)&=-\frac{(k-1)}{\Gamma(k)}d\tau\\ q_I(1)&=\frac{\Gamma(0)+\gamma(N-k)\bar{\tau}+\gamma(k-1)\tau}{\Gamma(0)\Gamma(N)} & dq_I(1)&=\frac{\gamma(k-1)}{\Gamma(0)\Gamma(k)}d\tau\\ q^*_{O_i}(1)&=\frac{\Gamma(0)+\gamma(N-k)\bar{\tau}-\Gamma(N-k+1)\tau}{\Gamma(0)\Gamma(N)} & dq^*_{O_i}(1)&=-\frac{2}{\Gamma(0)\Gamma(k)}d\tau\end{aligned}$$

and hence

$$\begin{aligned}dW=&-\frac{1}{\Gamma(0)^2\Gamma(N)\Gamma(k)}\{\Gamma(0)^2(k-1)+\gamma\Gamma(0)(k-1)(N-k)\bar{\tau}\\&+(k-1)\left[\gamma(k-1)(4-3\gamma)+2(1-\gamma)\Gamma(N-k+1)\right]\tau\}d\tau\end{aligned}$$

so the welfare of the liberalising country increases when tariffs are reduced according the OKW schedule. □

Proof of Proposition 6. Assume that CUs impose $\alpha\tau_{KW}$ as common external tariffs. The goal of this study is to determine for which values of α the CU formation game will lead to free trade in equilibrium. To determine this, I try to determine for which values of α, $W(N;\{N\}) - W(N-1;\{N-1,1\}) \geq 0$.

$$
\begin{aligned}
W(N;\{N\}) - W(N-1;\{N-1,1\}) = & \; Q(N) - Q(N-1) - \frac{\gamma}{2}\left[Q(N)^2 - Q(N-1)^2\right] \\
& - \frac{1-\gamma}{2}\left[Nq_I(N)^2 - (N-1)q_I(N-1)^2 - q_O(N-1)^2\right] \\
& + q_O(N-1)^2 - q_O(1)^2
\end{aligned}
$$

$$
\begin{aligned}
Q(N) - Q(N-1) &= \frac{\alpha\tau_{KW}(N-1)}{\Gamma(N)} \\
Q(N)^2 - Q(N-1)^2 &= \frac{\alpha\tau_{KW}(N-1)\left[2N - \alpha\tau_{KW}(N-1)\right]}{\Gamma(N)^2} \\
Nq_I(N)^2 &= \frac{N}{\Gamma(N)^2} \\
(N-1)q_I(N-1)^2 &= \frac{(N-1)\left[\Gamma(0)^2 + 2\gamma\Gamma(0)\alpha\tau_{KW}(N-1) + \gamma^2\alpha^2\tau_{KW}(N-1)^2\right]}{\Gamma(0)^2\Gamma(N)^2} \\
q_O(N-1)^2 &= \frac{\Gamma(0)^2 - 2\Gamma(0)\Gamma(N-1)\alpha\tau_{KW}(N-1) + \Gamma(N-1)^2\alpha^2\tau_{KW}(N-1)^2}{\Gamma(0)^2\Gamma(N)^2} \\
q_O(1)^2 &= \frac{\Gamma(0)^2 - 4\Gamma(0)\tau(1) + 4\tau(1)^2}{\Gamma(0)^2\Gamma(N)^2}
\end{aligned}
$$

with $\tau_{KW}(N-1) = \frac{2\tau(1)}{\Gamma(N-1)}$

$$
W(N;\{N\}) - W(N-1;\{N-1,1\}) = \frac{\tau(1)}{\Gamma(0)^2\Gamma(N-1)^2\Gamma(N)^2}\left[A\alpha^2 + B\alpha + C\right]
$$

where

$$
\begin{aligned}
A &= 2\tau(1)\left[\gamma\Gamma(0)^2 + (1-\gamma)(N-1)\gamma^2 + (3-\gamma)\Gamma(N-1)^2\right] \geq 0 \\
B &= -2\Gamma(0)\Gamma(N-1)\Gamma(2N-2) \leq 0 \\
C &= 4\Gamma(N-1)^2\left[\Gamma(0) - \tau(1)\right] \geq 0
\end{aligned}
$$

The stability condition $W(N;\{N\}) - W(N-1;\{N-1,1\}) = 0$ is a second degree polynomial in α. As A and C are both positive and B is negative, we know that if the polynomial has real roots, both roots will be positive. It can be shown that the polynomial has real roots for sufficiently large γ and N (for small values of these parameters, the stability condition is always positive and as Yi (1996) and Mrázová, Vines, and Zissimos (2009) showed, the CU formation game leads to free trade). Denote these roots α_1 and α_2 and assume, without loss of generality, that $\alpha_1 \leq \alpha_2$.

$$W(N; \{N\}) - W(N-1; \{N-1, 1\}) = \frac{\tau(1)}{\Gamma(0)^2\Gamma(N-1)^2\Gamma(N)^2}(\alpha - \alpha_1)(\alpha - \alpha_2)$$

$W(N; \{N\}) - W(N-1; \{N-1, 1\})$ is positive for $\alpha \leq \alpha_1$ and $\alpha \geq \alpha_2$. It can be further shown that $\alpha_1 > 1$ with $\lim\limits_{N \to +\infty} \alpha_1 = 1$ when $\gamma = 1$.

B Simulations

Yi (1996) in the unconstrained case and Mrázová, Vines, and Zissimos (2009) in the Article XXIV-constrained case showed that for $N \leq 1000$ there can be at most three CUs in equilibrium. I therefore confine attention to the case of at most three CUs, and simulate the bloc formation game where CUs impose $\alpha\tau_{KW}$ tariffs and determine the exact size of each bloc depending on the parameters α, γ and N. The simulation algorithm is as follows: call the three blocs A, B and C in order of formation, i.e. A will be the largest bloc and C the smallest one. For any k between 0 and $2N/3$ find j between 0 and $k/2$ which maximises the welfare of bloc B where the sizes of the blocs are

A	B	C
$N - k$	$k - j$	j

and where B is of same or smaller size than A and C is of same or smaller size than B ($k - j \leq N - k$ and $j \leq k - j$). Then find k (with j given in the previous step) which maximises the welfare of bloc A.

I run these simulations for $0 \leq \gamma \leq 1$ (varying γ by 0.001), $N = 4, \ldots, 1000$ and for $1 \leq \alpha \leq 5$ (varying α by 0.001). The simulations show that the equilibrium structure for all these parameters consists actually of at most two blocs. For small values of γ and N, the equilibrium structure is free trade as in Yi (1996) or Mrázová, Vines, and Zissimos (2009). Free trade is also the equilibrium for any values of γ and N when $\alpha = 1$, i.e. CUs impose exactly OKW tariffs. When $\alpha > 1$, but small, CU formation can still lead to free trade, but this becomes more and more difficult when γ and N increase.

Tables 1 and 2 illustrate the benchmark equilibria of the CU formation game for selected values of parameters N and γ for the unconstrained Nash and Article XXIV constrained case respectively. Table 3 then shows the equilibria of the CU formation game for the same parameters N and γ when CUs impose α-times the OKW tariff. We can see from Table 3 that the CU formation game leads to free trade even when CUs deviate from the OKW tariff, but the admissible deviation is smaller the higher N and γ. In all cases shown in Table 3, we have $\alpha\tau_{KW} < \tau_e$ and $\alpha\tau_{KW} < \tau_{WTO}$ which makes the equilibrium CU structure more asymmetric (the large bloc is larger and the small bloc is smaller) than in the unconstrained Nash and Article XXIV constrained case.

	N	$\gamma = 0.1$	$\gamma = 0.5$	$\gamma = 1$
	10	{10}	{9,1}	{9,1}
	50	{45,5}	{45,5}	{47,3}
τ_e	100	{88,12}	{90,10}	{96,4}
	500	{440,60}	{452,48}	{491,9}
	1000	{881,119}	{904,96}	{987,13}

Table 1: Equilibrium Nash CU structures of the size-announcement game.

	N	$\gamma = 0.1$	$\gamma = 0.5$	$\gamma = 1$
	10	{10}	{9,1}	{9,1}
	50	{43,7}	{40,10}	{44,6}
τ_{WTO}	100	{82,18}	{80,20}	{89,11}
	500	{392,108}	{395,105}	{444,56}
	1000	{779,221}	{790,210}	{889,111}

Table 2: Equilibrium CU structures of the size-announcement game with Article XXIV-constrained external tariffs.

	N	$\gamma = 0.1$	$\gamma = 0.5$	$\gamma = 1$
	10	{10}	{10}	{10}
	50	{50}	{50}	{50}
$\alpha = 1.001$	100	{100}	{100}	{100}
	500	{500}	{500}	{500}
	1000	{1000}	{1000}	{999,1}
	10	{10}	{10}	{10}
	50	{50}	{50}	{50}
$\alpha = 1.01$	100	{100}	{100}	{99,1}
	500	{500}	{499,1}	{499,1}
	1000	{1000}	{999,1}	{999,1}
	10	{10}	{10}	{9,1}
	50	{50}	{49,1}	{49,1}
$\alpha = 1.1$	100	{100}	{99,1}	{99,1}
	500	{499,1}	{499,1}	{499,1}
	1000	{999,1}	{999,1}	{999,1}
	10	{10}	{9,1}	{9,1}
	50	{49,1}	{49,1}	{49,1}
$\alpha = 1.5$	100	{98,2}	{99,1}	{99,1}
	500	{498,2}	{499,1}	{499,1}
	1000	{998,2}	{999,1}	{999,1}
	10	{10}	{9,1}	{9,1}
	50	{47,3}	{49,1}	{49,1}
$\alpha = 2$	100	{96,4}	{99,1}	{99,1}
	500	{496,4}	{499,1}	{499,1}
	1000	{996,4}	{999,1}	{999,1}
	10	{10}	{9,1}	{9,1}
	50	{45,5}	{47,3}	{48,2}
$\alpha = 5$	100	{89,11}	{96,4}	{98,2}
	500	{486,14}	{497,3}	{498,2}
	1000	{986,14}	{997,3}	{998,2}

Table 3: Equilibrium CU structures of the size-announcement game with $\alpha\tau_{KW}$.

References

BALDWIN, R. E. (2006): "Multilateralising Regionalism: Spaghetti Bowls as Building Blocs on the Path to Global Free Trade," *World Economy*, 29(11), 1451–1518.

——— (2008): "Big-think Regionalism: A Critical Survey," CEPR Discussion Paper no. 6874.

BALDWIN, R. E., AND A. J. VENABLES (1995): "Regional Economic Integration," in *Handbook of International Economics*, ed. by G. M. Grossman, and K. Rogoff, vol. 3, chap. 31, pp. 1597–1644. Elsevier.

BHAGWATI, J. (1991): *The World Trading System at Risk.* Princeton University Press, USA.

BLOCH, F. (1996): "Sequential Formation of Coalitions with Fixed Payoff Division and Externalities," *Games and Economic Behavior*, 14(1), 90–123.

BRANDER, J. A. (1981): "Intra-Industry Trade in Identical Commodities," *Journal of International Economics*, 11(1), 1–14.

ETHIER, W. J. (1998): "Regionalism in a Multilateral World," *Journal of Political Economy*, 106(6), 1214–1245.

FREUND, C. (2000): "Multilateralism and the Endogeneous Formation of Preferential Trade Agreements," *Journal of International Economics*, 51(2), 359–376.

FURUSAWA, T., AND H. KONISHI (2004): "A Welfare Decomposition in Quasi-Linear Economies," *Economics Letters*, 85(1), 29–34.

GOTO, J., AND K. HAMADA (1999): "Regional Economic Integration and Article XXIV of the GATT," *Review of International Economics*, 7(4), 555–570.

KEMP, M., AND H. WAN (1976): "An Elementary Proposition Concerning the Formation of Customs Unions," *Journal of International Economics*, 6(1), 95–97.

KRISHNA, P. (1998): "Regionalism and Multilateralism: A Political Economy Approach," *Quarterly Journal of Economics*, 113(1), 227–251.

McMillan, J. (1993): "Does Regional Integration Foster Open Trade? Economic Theory and GATT's Article XXIV," in *Regional Integration and the Global Trading System*, ed. by K. Anderson, and R. Blackhurst. Harvester Wheatsheaf, Hemel Hempstead.

Meade, J. E. (1955): *The Theory of Customs Unions*. Amsterdam: North-Holland.

Mrázová, M., D. Vines, and B. Zissimos (2009): "Is the WTO Article XXIV Bad?," CEPR Discussion Paper no. 7144.

Neary, J. P. (1998): "Pitfalls in the Theory of International Trade Policy: Concertina Reforms of Tariffs, and Subsidies to High-Technology Industries," *Scandinavian Journal of Economics*, 100(1), 187–206.

Ohyama, M. (1972): "Trade and Welfare in General Equilibrium," *Keio Economic Studies*, 9, 37–73.

Srinivasan, T. N. (1997): "The Common External Tariff of a Customs Union: Alternative Approaches," *Japan and the World Economy*, 9(4), 447–465.

Syropoulos, C. (1999): "Customs Unions and Comparative Advantage," *Oxford Economic Papers*, 51(2), 239–266.

Van Long, N., and A. Soubeyran (1997): "Customs Union and Gains from Trade Under Imperfect Competition: Variation of a Kemp-Wan Theme," *Japanese Economic Review*, 48(2), 166–175.

Viner, J. (1950): *The Customs Union Issue*. Carnegie Endowment for International Peace, New York.

Winters, L. A. (1997): "Regionalism and the Rest of the World: the Irrelevance of the Kemp-Wan Theorem," *Oxford Economic Papers*, 49(2), 228–234.

Yi, S.-S. (1996): "Endogenous Formation of Customs Unions under Imperfect Competition: Open Regionalism is Good," *Journal of International Economics*, 41(1), 153–177.