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Customs Unions and Contingent Protection between Competing Exporters

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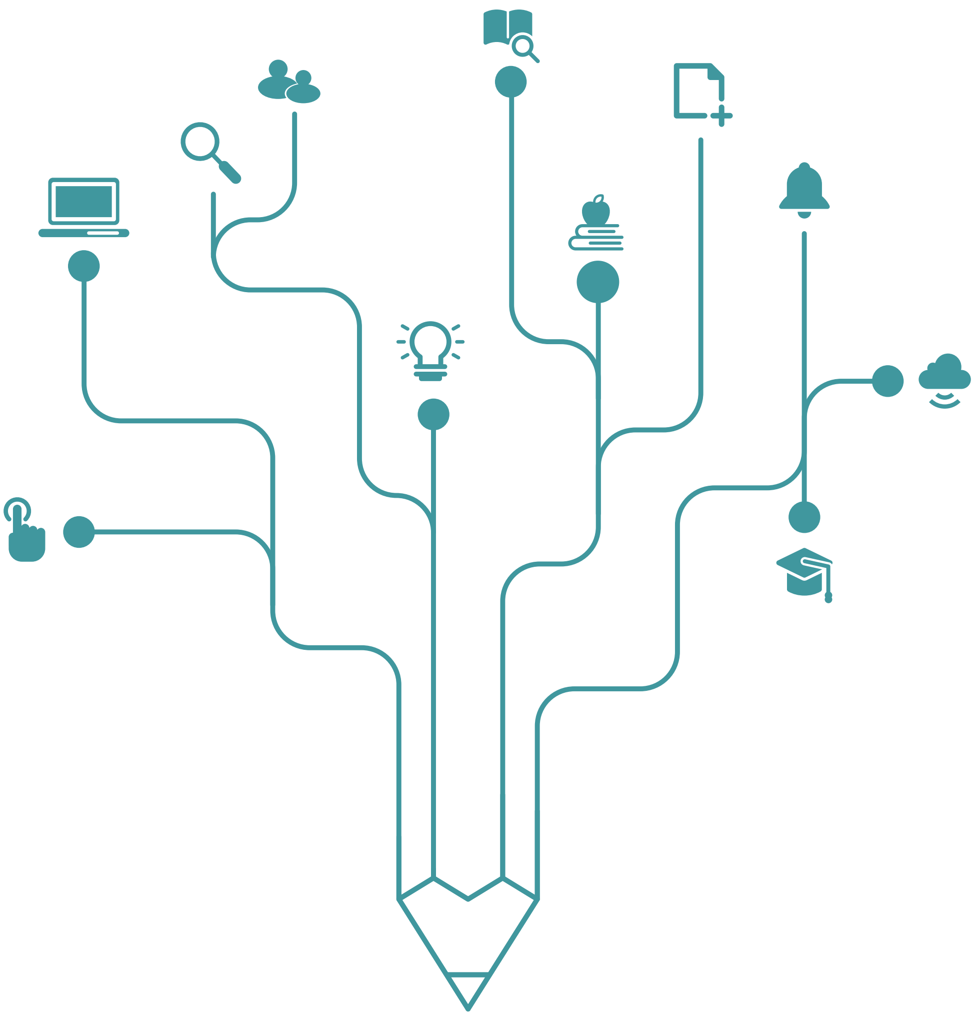

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Customs Unions and Contingent Protection between Competing Exporters*

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Abstract

This paper explores the ramifications of customs unions (CUs) for multilateral trade cooperation within an economic environment characterized by trade-volume volatility and in a competing-exporters framework. We demonstrate that the parallel formation of different CUs leads to a gradual but permanent reduction in multilateral trade tensions unlike in the competing-importers case (Tabakis, 2010). More specifically, we show that the formation of the CUs will be accompanied by a decline in contingent protection (such as safeguards or antidumping duties) but will have a less pronounced effect on "normal" most-favored-nation tariff protection.

Keywords: Customs unions; contingent protection; regionalism; competing exporters; trade diversion.
JEL classification: F13; F15.

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1 Introduction

In this paper, we explore the ramifications of the formation of customs unions (CUs) for multilateral trade cooperation within an economic environment characterized by trade volatility and in the context of competing exporters. In particular, we investigate the impact of CU formation on the level of "normal" most-favored-nation (MFN) tariff protection and on the use of contingent protection, such as antidumping duties and safeguards. Our main contribution is that we extend the previous theoretical work on preferential trade agreements (PTAs)—e.g., Bagwell and Staiger, 1997a, 1997b; Bond, Syropoulos, and Winters, 2001; Aghion, Antràs, and Helpman, 2007; Tabakis, 2010, 2015—by examining the impact of CUs on contingent protection in a competing-exporters framework.[1] This is am important endeavor given that both PTAs and contingent protection play a prominent role in modern commercial policy. For instance, according to the World Trade Organization (WTO), the number of notified active PTAs stands at 355, with this figure likely to increase in the near future as many new PTAs are currently under negotiation.[2] Furthermore, according to the WTO, as of 30 June 2022, there were 1980 antidumping and 292 countervailing measures in force.[3]

The competing-exporters model we present is built on three main assumptions. First, countries are limited to self-enforcing multilateral trade agreements—in other words, agreements that balance for all countries their short-term static gains from cheating against their long-term expected welfare losses due to the ensuing trade war (see Bagwell and Staiger, 2002). Second, countries face every period exogenous trade-volume shocks. This makes contingent protection an indispensable on-the-equilibrium-path safety valve, which allows multilateral cooperation to be preserved within a volatile trading environment (Bagwell and Staiger, 1990; Bown and Crowley, 2013). Third, the countries' trading relationship passes through three phases: an initial phase, a CU-negotiations phase during which the countries are involved in symmetric negotiations of CU agreements, and a final phase in which the CUs in question are

[1]For empirical studies on the interplay between regionalism and multilateralism, see Bohara, Gawande, and Sanguinetti (2004), Limão (2006), Karacaovali and Limão (2008), Estevadeordal, Freund, and Ornelas (2008), and Tabakis and Zanardi (2019).

[2]See http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx [accessed on February 4, 2023].

[3]See https://trade-remedies.wto.org/en [accessed on February 4, 2023].

in force and fully operational.

We show that the parallel formation of different CUs results in a gradual reduction in multilateral trade tensions, especially as far as contingent protection is concerned. The intuition underlying this result is straightforward. The CUs induce trade diversion, meaning that they lead to less trade between CU and non-CU partners. This reduces countries' short-term gains from defecting from the cooperative path, enabling them to maintain more liberal trade policies once the CU agreements come into force. Actually, even the mere negotiations of the CUs lead to a more liberal multilateral trading environment, as the prospective emergence of different CUs with the accompanying lowering of trade barriers at the multilateral level raises the expected discounted value of future cooperation (or, equivalently, the expected discounted cost of a future trade war) without affecting countries' static incentive to defect (which is a function of only the prevailing trade patterns).

It is important to stress here that our results differ from Tabakis (2010). In that paper, Tabakis examines the implications of CUs for multilateral trade cooperation in a competing-importers framework (rather than a competing-exporters one as in the present paper). He finds that the initiation of CU talks results in an easing of trade tensions at the multilateral level, especially with respect to the employment of contingent protection, which is in line with our findings. However, unlike in this paper, he finds that a retreat to a more protectionist trading environment becomes necessary once the CU agreements come into force so that multilateral cooperation does not collapse. In particular, in comparison with the pre-CU world, the utilization of contingent protection in the post-CU world is more severe for "high" import volumes but is less frequent overall. The difference in the results between the two papers can be attributed to the market-power effect, which is present in a competing-importers model but is absent in a competing-exporters one (as there is no external tariff harmonization since CU members do not import a common good).

The remainder of the paper is organized as follows. The next section sets out the basics of our model. Section 3 analyzes the static games corresponding to the initial phase, the transition phase, and the final phase. Section 4 analyzes the dynamic game from the perspective of the different phases. Finally, Section 5 offers some concluding remarks.

2 The Model

We consider a four-country, four-good world in which each country imports one good from the other three countries. In other words, we develop a competing-exporters framework. The four countries are X, Y, W, and Z; the four internationally traded goods are x, y, w, and z. We do not explicitly model the production process of the goods in question. Instead, we simply assume that, in any given period, the output of good j equals $1 - e$ in country J and $1 + \frac{e}{3}$ in the other three countries—i.e., the world output of each good equals 4—where $j \in \{x, y, w, z\}$, $J \in \{X, Y, W, Z\}$, and e is drawn independently over time from the uniform distribution on $[0, 1]$.[4] On the consumption side, we maintain the assumptions that demand functions are symmetric across countries and goods and that the demand for any given good in any country is independent of the other three goods' prices. More specifically, the demand for product $i \in \{x, y, w, z\}$ in country J is of the linear form $C(P_i^J) = \alpha - \beta P_i^J$, where $\alpha > \frac{4}{3}$ and $\beta > 0$ are constants and P_i^J is the price of good i in country J. Given our setup, country J's aggregate import demand for good j equals $C(P_j^J) - 1 + e$, and its export supply of good $i \neq j$ equals $1 + \frac{e}{3} - C(P_i^J)$. Thus, the countries face a common exogenous output/trade shock every period that is a function of e, with a higher e entailing a higher volume of trade between countries—at the expense of all import-competing producers.

We assume that, in each period, the countries simultaneously select (non-prohibitive) specific import tariffs with the goal of maximizing their individual national welfare. The tariffs are chosen after the countries observe the current-period realization of e and with perfect information as to all past trade policies. In addition, in line with the realities of the WTO, all tariffs conform to the MFN principle.[5]

As in Bagwell and Staiger (1997a) and Tabakis (2010), the multilateral trading environment passes through three phases. Phase I is an initial phase during which there is no activity on the regionalism front. The countries are aware, however, that it might eventually become politically feasible for countries X and Y on the one hand and countries W and Z on the other hand to embark upon bilateral CU negotiations. Phase II is a transition phase during

[4] It is understood here that if, for example, $J = X$, then $j = x$.

[5] Once a CU is established, however, barriers to intra-block trade are totally eliminated (i.e., tariff discrimination does occur).

which the countries are engaged in their respective bilateral CU talks while still trading as usual with one another. Finally, in phase III, the world consists of two symmetric CUs: one involving countries X and Y and another comprising countries W and Z. To avoid additional non-stationarities, we maintain the assumption that, once the CUs are formed, they persist into the infinite future.

The transition process between the different phases is modeled as follows: (i) if at any date t CU negotiations have not yet commenced, then there is probability $\rho \in (0, 1)$ that the negotiations for both CUs will begin in the next period; (ii) if at any date t CU talks are already in progress, then there is probability $\lambda \in (0, 1)$ that both CU agreements will be finalized and fully implemented by the beginning of the following period; and (iii) the transition probabilities, ρ and λ, are time invariant and history independent. In other words, if the countries are in phase I (phase II) at date t, then the probability of being in phase II (phase III) at date $t + 1$ is ρ (λ). Modeling the transition process between phases in this fashion—with the countries passing through the different phases concurrently—ensures that all countries face symmetric situations throughout the game, considerably simplifying our analysis.

For this symmetric non-stationary dynamic game, we focus on symmetric cooperative subgame-perfect equilibria in which (i) along the equilibrium path, in any given phase of the game, all countries select their tariffs at all dates within the phase according to a common cooperative tariff rule; and (ii) if at any point in the game a defection occurs, then all countries revert from the following period onwards to non-cooperative Nash play. Therefore, the countries employ grim-trigger strategies in order to support multilateral cooperation. For such equilibria, there will be three cooperative tariff *functions*, one per phase, specifying the cooperative level of protection in the different phases for any given e.[6] Let the phase-I, phase-II, and phase-III cooperative tariff functions be denoted by $\tau_1^c(e)$, $\tau_2^c(e)$, and $\tau_3^c(e)$, respectively. Our interest lies in the most cooperative such functions: $\widehat{\tau}_1^c(e)$, $\widehat{\tau}_2^c(e)$, and $\widehat{\tau}_3^c(e)$. The tariff functions in question specify, for any realization of e, the lowest level of protection that can be supported as an equilibrium outcome in the initial, the transition, and the final phases of

[6]Notice that our constant-hazard-rate assumption allows us to look for a single cooperative tariff function for all dates within a phase.

our game. To derive $\widehat{\tau}_1^c(e)$, $\widehat{\tau}_2^c(e)$, and $\widehat{\tau}_3^c(e)$, we proceed in a recursive fashion.

3 Static Games

3.1 Phase-III Static Game

We first look at phase III during which the world consists of two symmetric CUs: one formed by countries X and Y and another formed by countries W and Z. In this subsection, we characterize the equilibrium that would emerge in a non-cooperative environment. In particular, we determine the (non-cooperative) Nash tariff that the countries would pick in a one-shot game.

Let τ_j denote country J's specific import tariff on good j.[7] Goods' equilibrium prices in the different markets can be derived using the standard no-arbitrage and market-clearing conditions. For example, for good x, the aforementioned conditions are respectively given by

$$P_x^X = P_x^Y = P_x^W + \tau_x = P_x^Z + \tau_x \text{ and} \tag{1}$$

$$1 - e + 3\left(1 + \frac{e}{3}\right) = C\left(P_x^X\right) + C\left(P_x^Y\right) + C\left(P_x^W\right) + C\left(P_x^Z\right). \tag{2}$$

Using Equations (1)–(2), we can readily obtain the equilibrium price of good x in each market:

$$P_x^X(\tau_x) = P_x^Y(\tau_x) = \frac{\alpha - 1}{\beta} + \frac{\tau_x}{2} \text{ and} \tag{3}$$

$$P_x^W(\tau_x) = P_x^Z(\tau_x) = \frac{\alpha - 1}{\beta} - \frac{\tau_x}{2}. \tag{4}$$

Analogous relationships hold for the other three goods.

Given the perfectly symmetric structure of our model, let us now focus on country X. We define its welfare as the sum of consumer surplus from consumption of all four goods, producer surplus from production of all four goods, and tariff revenue generated by taxing the imports of good x from countries W and Z (i.e., the non-CU trading partners). More specifically,

[7] We suppress the country superscript on import tariffs, as each good is imported by only one country and each country applies the same tariff against all non-CU trading partners.

country X's welfare in phase III equals

$$W_3^X(e,\tau_x,\tau_y,\tau_w,\tau_z) = \sum_j \int_{P_j^X(\tau_j)}^{\alpha/\beta} C(P)\,dP + \int_0^{P_x^X(\tau_x)} (1-e)\,dP$$
$$+\sum_{-x} \int_0^{P_{-x}^X(\tau_{-x})} \left(1+\frac{e}{3}\right) dP + \tau_x X_x^W(e,\tau_x) + \tau_x X_x^Z(e,\tau_x), \tag{5}$$

where $j \in \{x,y,w,z\}$, $-x \in \{x,y,w,z\} \setminus \{x\} = \{y,w,z\}$, and $X_x^W(e,\tau_x)$ and $X_x^Z(e,\tau_x)$ represent the (market-clearing) exports of good x from countries W and Z, respectively. It is direct to show that $X_x^W(e,\tau_x) = X_x^Z(e,\tau_x) = \frac{e}{3} - \frac{\beta\tau_x}{2}$, i.e., a country's export volume to a given trading partner is decreasing in the import tariff selected by the latter and increasing in the output shock, e.

With Equation (5) in place, we can now derive the best-response tariff for country X. Since countries X and Y have a CU agreement in place, they set their tariffs vis-à-vis countries W and Z so as to maximize their joint welfare, and vice versa.[8] Differentiating the joint welfare function of countries X and Y with respect to τ_x, we obtain

$$\frac{\partial W_3^X(\cdot)}{\partial \tau_x} + \frac{\partial W_3^Y(\cdot)}{\partial \tau_x} = \frac{e}{3} - \frac{3}{2}\beta\tau_x. \tag{6}$$

It follows that $W_3^X(\cdot)+W_3^Y$ is strictly concave in τ_x and that, for any given tariffs of its trading partners, country X's optimal response is $\tau_x^R = \frac{2e}{9\beta}$. Notice that country X's best-response tariff is independent of the other countries' tariffs, i.e., country X has a strictly dominant strategy.

Finally, exploiting symmetry, we have that all countries select the following import tariff in the Nash equilibrium of our phase-III static game:

$$\tau_3^N(e) = \frac{2e}{9\beta}. \tag{7}$$

This (unique) Nash equilibrium is not Pareto optimal, as it can be easily verified that, for any country J, $W_3^J(e,\tau,...,\tau)$ is strictly decreasing in τ. Therefore, all countries would benefit from symmetric trade liberalization in a monotonic way.

[8] Since countries X and Y do not import a common good, no external tariff harmonization is required.

3.2 Phase-II & Phase-I Static Games

In this subsection, we characterize the static Nash equilibrium for phases I and II, as the phase-I and phase-II static games are identical. Focusing on good x, the no-arbitrage condition is now given by

$$P_x^X = P_x^Y + \tau_x = P_x^W + \tau_x = P_x^Z + \tau_x. \tag{8}$$

Using also the market-clearing condition (see Equation (2)), we obtain the following equilibrium prices of good x, with analogous relationships holding for the other three goods:

$$P_x^X(\tau_x) = \frac{\alpha - 1}{\beta} + \frac{3\tau_x}{4} \text{ and} \tag{9}$$

$$P_x^{-X}(\tau_x) = \frac{\alpha - 1}{\beta} - \frac{\tau_x}{4}, \tag{10}$$

where $-X \in \{X, Y, W, Z\} \setminus \{X\} = \{Y, W, Z\}$.

Let us now focus on country X. Its welfare in phases II and I equals

$$W_1^X(e, \tau_x, \tau_y, \tau_w, \tau_z) = W_2^X(e, \tau_x, \tau_y, \tau_w, \tau_z) = \sum_j \int_{P_j^X(\tau_j)}^{\alpha/\beta} C(P)\, dP + \int_0^{P_x^X(\tau_x)} (1 - e)\, dP$$

$$+ \sum_{-x} \int_0^{P_{-x}^X(\tau_{-x})} \left(1 + \frac{e}{3}\right) dP + \tau_x X_x^Y(e, \tau_x) + \tau_x X_x^W(e, \tau_x) + \tau_x X_x^Z(e, \tau_x), \tag{11}$$

where $X_x^Y(e, \tau_x)$ represents the (market-clearing) exports of good x from country Y. It can be readily shown that $X_x^Y(e, \tau_x) = X_x^W(e, \tau_x) = X_x^Z(e, \tau_x) = \frac{e}{3} - \frac{\beta \tau_x}{4}$.

With Equation (11) in place, we can now derive the best-response tariff for country X. Differentiating the welfare function of country X with respect to τ_x, we obtain

$$\frac{\partial W_3^X(\cdot)}{\partial \tau_x} = \frac{1}{4}\left(e - \frac{15}{4}\beta\tau_x\right), \tag{12}$$

meaning that country X's best-response tariff, τ_x^R, equals $\frac{4e}{15\beta}$.

Finally, exploiting symmetry, we obtain the following Nash equilibrium tariff for our phase-II and phase-I static games:

$$\tau_1^N(e) = \tau_2^N(e) = \frac{4e}{15\beta} > \frac{2e}{9\beta} = \tau_3^N(e), \tag{13}$$

which reflects the tariff-complementarity effect of PTA creation in a competing-exporters setting (Bagwell and Staiger, 1999).

4 Dynamic Game

4.1 Phase-III

In order to begin exploring the ramifications of CU formation for multilateral trade cooperation, we now allow for infinitely repeated interaction between the countries. More specifically, we first look for the most cooperative symmetric equilibrium that can be supported in a dynamic setting in phase III given the threat of infinite reversion to static Nash play should a defection ever take place. The dynamic game we consider is the infinite repetition of the Phase-III static game analyzed above. At the beginning of each period, the CUs become informed of the current realization of e (entailing a given free-trade volume of inter-block trade). They, then, simultaneously choose their current-period trade policies and receive the resulting payoffs. At the start of the following period, all past tariff choices are common knowledge, and the countries experience a new common output shock, e.

An equilibrium cooperative tariff function for phase III must provide no CU with an incentive to defect (i.e., it must be self-enforcing). To formalize this condition, let us first look at the one-time benefit to either CU from cheating. To this end, let us fix both e and a cooperative tariff level $\tau_3^c < \tau_3^N(e)$. It is obvious that a CU opting to deviate from the cooperative path does best by selecting the best-response tariff, $\tau_3^N(e)$. The one-time gains from cheating for country J, then, equal

$$\Omega_3^J(e, \tau_3^c) \equiv W_3^J\left(e, \tau_3^N(e), \tau_3^N(e), \tau_3^c, \tau_3^c\right) - W_3^J(e, \tau_3^c, \tau_3^c, \tau_3^c, \tau_3^c). \tag{14}$$

Ω_3^J simply equals country J's one-time welfare gains from deviating to its best-response tariff while its non-CU trading partners still cooperate with τ_3^c.

However, a violation of the cooperative agreement also bears consequences, as it leads to a trade war. Let $\delta \in \left(0, \overline{\delta}\right)$ be the discount factor between periods, with $\overline{\delta} < 1$ such that countries are not too patient, and E be the expectations operator with expectations taken over the distribution of e. We can, then, write the expected discounted cost of cheating for country J as

$$\omega_3^J(\tau_3^c(\cdot)) \equiv \frac{\delta}{1-\delta}[EW_3^J(e, \tau_3^c(e), ..., \tau_3^c(e)) - EW_3^J(e, \tau_3^N(e), ..., \tau_3^N(e))]. \tag{15}$$

Using Equations (14)–(15), we can now formally state the no-defection condition for phase III:

$$\Omega_3^J\left(e, \tau_3^c\left(e\right)\right) \leq \omega_3^J\left(\tau_3^c\left(\cdot\right)\right), \forall e. \tag{16}$$

From all the cooperative tariff functions that satisfy the condition above, our interest lies in the most cooperative one, $\widehat{\tau}_3^c\left(e\right)$. Given the complexity of our model, we resort hereafter to numerical analysis.[9]

4.2 Phase II

We now turn to phase II. Phase II is the transition phase during which the countries trade normally with each other while being engaged in their respective bilateral CU talks—between, on the one hand, countries X and Y, and, on the other hand, countries W and Z.

To derive the no-defection condition for phase II, let us fix both e and a cooperative tariff level $\tau_2^c < \tau_2^N\left(e\right)$. The static incentive a country has to defect from the cooperative path while in phase II is represented by

$$\Omega_2^J\left(e, \tau_2^c\right) \equiv W_2^J\left(e, \tau_2^N\left(e\right), \tau_2^c, \tau_2^c, \tau_2^c\right) - W_2^J\left(e, \tau_2^c, \tau_2^c, \tau_2^c, \tau_2^c\right). \tag{17}$$

On the other hand, the discounted expected future welfare loss faced by a defector equals

$$\begin{aligned}
&\delta \sum_{r=1}^{\infty} \lambda\left(1-\lambda\right)^{r-1} \left\{ \sum_{q=1}^{r-1} \delta^{q-1}\left[EW_2^J(e, \tau_2^c\left(e\right), ..., \tau_2^c\left(e\right)) \right.\right. \\
&- EW_2^J(e, \tau_2^N\left(e\right), ..., \tau_2^N\left(e\right))\Big] + \sum_{k=r}^{\infty} \delta^{k-1}\left[EW_3^J(e, \widehat{\tau}_3^c\left(e\right), ..., \widehat{\tau}_3^c\left(e\right)) \right. \\
&\left.\left. - EW_3^J(e, \tau_3^N\left(e\right), ..., \tau_3^N\left(e\right))\right]\right\} \equiv \omega_2^J\left(\tau_2^c\left(\cdot\right)\right),
\end{aligned} \tag{18}$$

where r indexes the date at which phase III will start, with $r = 1$ signifying that phase III will begin in one period's time, and where q and k correspond to periods within phases II and III, respectively.[10]

The phase-II no-defection condition is, then, given by

$$\Omega_2^J\left(e, \tau_2^c\left(e\right)\right) \leq \omega_2^J\left(\tau_2^c\left(\cdot\right)\right), \forall e. \tag{19}$$

[9] The numerical analysis was carried out using Mathematica. The file is available from the authors upon request.

[10] We maintain the assumption that $\sum_{q=1}^{0} \delta^{q-1}\left[...\right] \equiv 0$.

This condition simply states that the cooperative tariff function $\tau_2^c(e)$ can be sustained as an equilibrium outcome in phase II as long as, for all countries and for any e, defection to $\tau_2^N(e)$ and thenceforth infinitely repeated static Nash play is welfare inferior to the implementation of strategy $\tau_2^c(e)$ at first and of strategy $\widehat{\tau}_3^c(e)$ once phase III is reached.

Our numerical analysis reveals that, for reasonable parameter values,

$$\widehat{\tau}_3^c(e) = \widehat{\tau}_2^c(e) = 0 \text{ for } e \in [0, \overline{e}] \text{; and}$$

$$\widehat{\tau}_2^c(e) > \widehat{\tau}_3^c(e) \text{ for } e \in (\overline{e}, 1].$$

To gain some insight into this result, note that, once the CUs are formed, CU partners trade less than previously with non-CU partners (i.e., trade diversion takes place). Moreover, defection during the transition phase entails applying the best-response tariff (i.e., the static Nash one) against all trading partners, including the potential future CU partner—this is not the case in the final phase. Therefore, for a given cooperative tariff function, the static incentive to cheat is stronger in phase II than in phase III. A higher level of protection is thereby required *on average* in phase II relative to phase III so that the incentive to defect is kept in check and, thus, multilateral cooperation is not threatened. The difference between the two phases, though, is only felt for realizations of e above $\overline{e}$. For $e \leq \overline{e}$, the equilibrium trade policies in phases II and III are identical: zero protection. In other words, the emergence of the CUs has a dampening effect mostly on the use of contingent trade protection—such as safeguards or antidumping duties—rather than on MFN tariffs (i.e., "normal" trade protection).

4.3 Phase I

We finally derive the most cooperative equilibrium tariff function for phase I using $\widehat{\tau}_2^c(e)$ and $\widehat{\tau}_3^c(e)$. We next determine $\omega_1^J(\tau_1^c(\cdot))$, i.e., the expected discounted value of future cooperation from a phase-I perspective:

$$\begin{aligned} &\delta \sum_{s=1}^{\infty} \rho (1-\rho)^{s-1} \left\{ \sum_{t=1}^{s-1} \delta^{t-1} \left[EW_1^J(e, \tau_1^c(e), ..., \tau_1^c(e)) \right.\right. \\ &- EW_1^J(e, \tau_1^N(e), ..., \tau_1^N(e)) \big] + \delta^{s-1} \left(\left[EW_2^J(e, \widehat{\tau}_2^c(e), ..., \widehat{\tau}_2^c(e)) \right.\right. \\ &\left.\left.\left. -EW_2^J(e, \tau_2^N(e), ..., \tau_2^N(e)) \right] + \omega_2^J(\widehat{\tau}_2^c(\cdot)) \right) \right\} \equiv \omega_1^J(\tau_1^c(\cdot)), \end{aligned} \tag{20}$$

where s indexes the date at which phase II will commence, with $s = 1$ denoting that phase II will begin in one period's time, and where t refers to periods within phase I. Furthermore, as phases I and II are characterized by identical trade patterns, Ω_1^J equals to Ω_2^J for a given trade shock and cooperative tariff level. Therefore, the phase-I no-defection condition is given by

$$\Omega_1^J \left(e, \tau_1^c (e)\right) \leq \omega_1^J \left(\tau_1^c (\cdot)\right), \forall e. \tag{21}$$

Our numerical analysis reveals that, for reasonable parameter values,

$$\begin{aligned} \widehat{\tau}_3^c (e) = \widehat{\tau}_2^c (e) = \widehat{\tau}_1^c (e) = 0 \text{ for } e \in [0, \widetilde{e}]\,; \\ \widehat{\tau}_1^c (e) > \widehat{\tau}_2^c (e) = \widehat{\tau}_3^c (e) = 0 \text{ for } e \in (\widetilde{e}, \overline{e}]\,; \text{ and} \\ \widehat{\tau}_1^c (e) > \widehat{\tau}_2^c (e) > \widehat{\tau}_3^c (e) \;\text{ for } e \in (\overline{e}, 1]\,, \end{aligned} \tag{22}$$

where $0 < \widetilde{e} < \overline{e} < 1$.

To understand our results, note that the only difference between phases I and II is the latter one is closer to the final phase in which the CUs are full operational. Since the final phase is characterized by a lower level of protection on average, leading to elevated expected per-period equilibrium gains from cooperation, the expected discounted value of future cooperation from a phase-II standpoint strictly exceeds the one from a phase-I perspective for a given cooperative tariff function. Moreover, recall that Ω_1^J equals to Ω_2^J for a given trade shock and cooperative tariff level. Thus, a lower level of protection can be supported *on average* in the transition phase relative to phase I. However, the equilibrium level of protection is higher in phase I only for realizations of $e > \widetilde{e}$, which reaffirms the optimality of *targeted* enforcement. In other words, the start of bilateral CU negotiations has a dampening effect mostly on the use of contingent protection rather than on the level of "normal" MFN tariff protection. Finally, the intuition underlying the comparison of the most cooperative equilibrium trade policies in phases I and III is similar to the one described in the previous subsection (regarding phases II and III).

5 Conclusions

This paper has explored the implications of CU formation for multilateral trade cooperation within an economic environment characterized by trade volatility and in the context of competing exporters. In particular, we have investigated the impact of CU formation on the level of "normal" MFN tariff protection and on the use of contingent protection, such as antidumping duties and safeguards, assuming that countries are limited to cooperative multilateral agreements that are self-enforcing.

We have demonstrated that the parallel formation of different CUs results in a gradual reduction in multilateral trade tensions, especially as far as contingent protection is concerned. In addition, even the mere negotiations of CUs lead to a more liberal multilateral trading environment, with the effect being less pronounced on MFN tariffs. Therefore, our analysis has highlighted a building-block effect of CUs on multilateral cooperation in the context of competing exporters.

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