



Munich Personal RePEc Archive

# **Foreign Direct Investment and Customs Union: Incentives for Multilateral Tariff Cooperation over Free Trade**

Yildiz, Halis Murat

Ryerson University

2 April 2010

Online at <https://mpra.ub.uni-muenchen.de/22346/>

MPRA Paper No. 22346, posted 26 Apr 2010 23:52 UTC

# Foreign Direct Investment and Customs Union: Incentives for Multilateral Tariff Cooperation over Free Trade

Halis Murat Yildiz\*

April 2, 2010

## Abstract

We examine the implications of a customs union (CU) on the pattern of tariffs, welfare and the prospects for free trade when the nonmember firm has an incentive to engage in foreign direct investment (FDI). First we show that upon the formation of a bilateral CU, the non-member firm has greater incentives to engage in FDI. However, when FDI becomes a feasible entry option for the nonmember firm under a CU, member countries have incentives to strategically induce export over FDI by lowering their joint external tariff. When fixed set-up cost of FDI is sufficiently low, this tariff falls below Kemp-Wan tariff and CU leads to a Pareto improvement relative to no agreement. Moreover, using an infinite repetition of the one-shot tariff game under a CU, we show that FDI incentive of the nonmember firm makes the member countries (nonmember country) more (less) willing to cooperate multilaterally over free trade.

**Keywords:** Customs Union, Foreign Direct Investment, Multilateral Tariff Cooperation.

**JEL Classifications:** F12, F13

---

\*Department of Economics, Ryerson University, 350 Victoria Street, Toronto, ON, Canada M5B 2K3. Phone: 416-979-5000 (ext 6689); Fax: 416 598-5916; e-mail: hyildiz@ryerson.ca.

# 1 Introduction

Over the last few decades, the proliferation of preferential trade agreements (PTAs) has been the visible trend in the international trading system. Article XXIV of the General Agreement on Tariffs and Trade (GATT) permits member countries of the World Trade Organization (WTO) to form preferential trade agreements (PTAs) such as free trade agreements (FTAs) and customs unions (CUs) under which PTA members can grant tariff reductions to each other that they do not extend to other WTO members. As per the WTO's official web-site, by December 2008, the WTO had received notification of 421 such arrangements, of which 324 were notified under Article XXIV.<sup>1</sup> While FTAs constitute an overwhelming majority of PTAs, the existing CUs involve some of the major economies of the world: for example, the Latin American CU MERCOSUR counts Argentina, Brazil, Paraguay, and Uruguay as its members while the EC (27) – a CU that extends across both goods and services – comprises of most major European economies. As a result, it is important to obtain a better understanding of the factors that give rise to CUs and the effect CUs have on the multilateral trading system.

Ever since Jacob Viner (1950)'s classic analysis, the static distortions created by such preferential trade liberalization have received significant attention from economists and policy-makers alike. Furthermore, in recent years there has been widespread concern regarding the potential adverse effects of PTAs on the process of multilateral trade liberalization (the *raison d'être* of the World Trade Organization (WTO)).

Concurrent with the proliferation of PTAs, world economy has also witnessed the largest ever FDI growth both in developing and developed countries. New patterns of globalization have accelerated the internationalization of industries and reshaping of global industrial structure. While PTAs induce significant changes in the patterns of trade and investment,

---

<sup>1</sup>About 230 such agreements were already in force by December 2008 with the number expected to reach 400 by 2010. Mongolia is the only WTO member that does not participate in any PTA and most WTO members belong to multiple PTAs. Indeed, one even observes major PTAs in discussion with each other regarding mutual liberalization.

the existing literature on PTAs has treated export as the only mode of entry and mostly overlooked the role of foreign direct investment (FDI). PTAs, by eliminating tariffs among members, lead to an expanded market and thus increase the incentives of nonmember countries' firms to penetrate into the integrated area via FDI by building a plant in one of the member countries and producing output that will be sold in all member countries' markets.<sup>2</sup> Based upon this observation, the present paper examines the case where the formation of a customs union (CU) gives a nonmember firm an incentive to engage in FDI in member countries' markets while this incentive does not exist under no agreement.<sup>3</sup>

What are the implications of a CU on the pattern of tariffs, welfare, and the prospects for global free trade when a nonmember firm has an option to engage in FDI? Under repeated interaction, how does the FDI option affect incentives of member and non-member countries for multilateral cooperation over free trade? To address these questions, we utilize an oligopoly model of intra-industry trade between three countries. In our model, we focus on the scenario where countries are completely symmetric both from efficiency and market size perspectives. Consistent with this scenario, we assume that there exists no externalities arising from FDI both for the host and the source countries. In other words, consistent with the literature, firms typically face a trade-off between the fixed cost of an additional plant in the export market and the benefit of economizing on tariffs and trade costs.<sup>4</sup>

We first derive the Nash equilibrium of a one-shot game with and without FDI option under no agreement and a bilateral CU. When two countries form a customs union, they eliminate tariffs on each other, and impose a lower tariff on the non-member firm. This external tariff effect is called as the tariff complementarity effect (Bagwell and Staiger, 1997). Even though the tariff is lower, the non-member firm earns lower profit from its exports,

---

<sup>2</sup>Donnenfeld (2003) has highlighted the role of FDI incentives in determining the consequences of regional bloc formation on interbloc and intrabloc trade.

<sup>3</sup>Jaumotte (2004) found a positive impact of PTAs on the FDI received by member countries, even more so in the 1990s when such agreements were revived.

<sup>4</sup>Markusen (1995) surveyed the theoretical literature on FDI and multinational enterprises (MNE). This literature includes papers by Dunning (1977), Horstmann and Markusen (1992), Markusen and Venables (1998).

because the member firms expand their output in each others' markets. It follows that the non-member firm has greater incentives to engage in FDI following the formation of CU. We show that, when there exists no externalities attached to FDI activities, member countries have incentives to strategically induce export over FDI by lowering their joint external tariff if FDI becomes a feasible entry option for the nonmember firm under a CU. When fixed set-up cost of FDI is sufficiently low, this tariff falls below Kemp-Wan tariff (1976) and CU leads to a Pareto improvement relative to no agreement.

Then, we examine the infinite repetition of the above one-shot game under a bilateral CU and examine the incentives of countries to multilaterally cooperate over free trade. Multilateral tariff cooperation over free trade is modeled as a stationary repeated game where cooperation can be sustained only if it is incentive compatible for all countries.<sup>5</sup> In these models, cooperation is self-enforcing in the sense that each country balances the current benefit of deviating from free trade against the future losses caused by the breakdown of multilateral cooperation that results from its defection. We show that when the nonmember firm has no FDI incentives, member countries are less willing to cooperate multilaterally over free trade than the nonmember country so that the non-member country's incentive is binding for the multilateral cooperation over free trade. On the other hand, when the non-member country's firm has an incentive to engage in FDI and multilateral cooperation breaks down, member countries internalize the potential FDI threat and lower their external tariffs on nonmember's export forever (while the nonmember country switches to its MFN). Therefore, the cost of defection to the nonmember country falls whereas it rises for member countries and thus the nonmember country (member countries) has (have) stronger (weaker) incentive to defect from cooperation since CU's external tariff gets lower. As a result, we argue that the non-member firm's FDI incentives make the member countries (nonmember country) more (less) willing to cooperate multilaterally over free trade.

---

<sup>5</sup>See Bagwell and Staiger (1997 and 1998), Bond et. al. (2001), and Saggi (2006).

## 2 Basic Model

We develop an oligopoly model of trade with three symmetric countries:  $z = i, j, k$  and two goods:  $x$  and  $y$ . Good  $x$  is produced by a single profit-maximizing firm in each country at a constant marginal cost  $c$  in terms of the numeraire good  $y$ . Preferences over the two goods are quasilinear:

$$U_i(x_i, y_i) = u(x_i) + y_i \quad (1)$$

Furthermore,  $u(x_i)$  is assumed to be quadratic so that the demand curve for good  $x$  is linear in each country:

$$p_i(x_i) = \alpha - \sum_z x_{zi} \quad (2)$$

where  $x_{zi}$  denotes the output sold by country  $z$ 's firm in country  $i$  while  $x_i$  is the total output sold in country  $i$ :  $x_i \equiv \sum_z x_{zi}$ .

We examine a three-stage game under two trade regimes: no agreement  $\langle\{\Phi\}\rangle$  and a bilateral customs union  $\langle\{ij\}\rangle$ . In the first stage, countries simultaneously choose their optimum tariffs. Then, firms decide whether to serve foreign markets via export or FDI. Finally, firms compete in Cournot fashion. We obtain the subgame perfect Nash equilibrium (SPNE) by backward induction.

### 2.1 No Agreement $\langle\{\Phi\}\rangle$

We use an indicator function to differentiate the export and FDI equilibrium:

$$I_f = \begin{cases} 1 & \text{if a firm makes FDI} \\ 0 & \text{if a firm exports} \end{cases}$$

In the export equilibrium ( $I_f = 0$ ), we restrict our attention to symmetric tariffs based on Most Favored Nation (MFN) clause where  $t_i$  denotes the tariff imposed by country  $i$ . By contrast, when a firm makes FDI ( $I_f = 1$ ), it avoids bearing tariff costs but has to pay an exogenous plant-level fixed cost  $F$  in each of the two countries. Firm  $i$ 's effective marginal cost in country  $j$  equals:

$$c_{ij} = c + t_j[1 - I_f], \text{ for all } i \neq j \quad (3)$$

Then, profit of firm  $i$  in country  $j$ 's market can be written as:

$$\pi_{ij} = x_{ij}p_j(x_j) - c_{ij}x_{ij} - I_f F, \text{ for all } i \neq j \quad (4)$$

First order conditions (FOCs) for profit maximization are

$$p_j + p'_j x_{ij} = c_{ij}, \text{ for all } i \neq j \quad (5)$$

The above FOCs together with an analogous condition for the local firm can be easily solved for equilibrium output levels and profits:

$$\pi_{ii} = x_{ii}^2, \pi_{ij} = x_{ij}^2 - I_f F, \text{ for all } i \neq j \quad (6)$$

Welfare of country  $i$  is defined as the sum of its domestic surplus and total export profits:

$$W_i \equiv S_i + \sum_{j \neq i} \pi_{ij} \quad (7)$$

where

$$S_i \equiv u(x_i) - p_i x_i + \pi_{ii} + t_i [1 - I_f] \sum_{j \neq i} x_{ji} \quad (8)$$

In the export equilibrium ( $I_f = 0$ ), since markets are segmented, strategic independence of trade policies obtains. Thus, country  $i$ 's tariff choice problem reduces to:

$$\max_{t_i} S_i \equiv u(x_i) - p_i x_i + \pi_{ii} + t_i \sum_{j \neq i} x_{ji} \quad (9)$$

The optimal tariff is given by

$$t_i^\phi = \frac{3(\alpha - c)}{10} \quad (10)$$

Foreign profits under export and FDI equilibria are found as follows:

$$\pi_{ij}(I_f = 0) = \left[ \frac{\alpha - c}{10} \right]^2 \text{ and } \pi_{ij}(I_f = 1) = \left[ \frac{\alpha - c}{4} \right]^2 - F \quad (11)$$

Then, a firm prefers FDI over export under  $\langle \{\Phi\} \rangle$  when  $F$  falls below  $\bar{F}^\phi$ :

$$\pi_{ij}(I_f = 1) \geq \pi_{ij}(I_f = 0) \text{ iff } F \leq \bar{F}^\phi = 21 \left[ \frac{\alpha - c}{20} \right]^2 \quad (12)$$

## 2.2 Customs Union (CU) $\langle\{ij\}\rangle$

In the export equilibrium ( $I_f = 0$ ) under CU  $\langle\{ij\}\rangle$ , member countries ( $i$  and  $j$ ) impose a common external tariff  $t_u$  on the nonmember while simultaneously eliminating tariffs on each other. Due to symmetry and market segmentation, member countries solve

$$\max_{t_u} S_i(t_u) + \pi_{ji}(t_u) \quad (13)$$

and the optimal tariff is:

$$t_u^* = \frac{5(\alpha - c)}{19} \quad (14)$$

When countries form a CU, member countries' export increases while that of non-member countries decreases. Thus, compared to  $\langle\{\Phi\}\rangle$ , CU members' incentives to impose a tariff on the non-member decrease since it becomes less important source for rent-extraction:  $t_u^* < t_i^\phi$ . In other words, tariff complementarity effect obtains (see Bagwell and Staiger, 1997).

In contrast to  $\langle\{\Phi\}\rangle$ , nonmember firm ( $k$ ) can engage in FDI under  $\langle\{ij\}\rangle$  by building only one plant within the borders of CU and servicing the entire market freely with the goods produced in this plant. Let  $\Pi_k^u$  and  $\Pi_k^{u-f}$  denote the total profits of  $k$  under  $\langle\{ij\}\rangle$  in export and FDI equilibria respectively:

$$\Pi_k^u = \pi_{ki}^u + \pi_{kj}^u = 2 \left[ \frac{\alpha - c}{19} \right]^2 \quad \text{and} \quad \Pi_k^{u-f} = \pi_{ki}^{u-f} + \pi_{kj}^{u-f} = 2 \left[ \frac{\alpha - c}{4} \right]^2 - F \quad (15)$$

As a result,

$$\Pi_k^{u-f} \geq \Pi_k^u \quad \text{iff} \quad F \leq \bar{F}^u = \frac{345}{2} \left[ \frac{\alpha - c}{38} \right]^2 \quad (16)$$

**Proposition 1:** *Critical fixed set-up cost is higher under  $\langle\{ij\}\rangle$  than under  $\langle\{\Phi\}\rangle$ :  $\bar{F}^u > \bar{F}^\phi$ .*

The above proposition indicates that the emergence of a CU increases the incentives of nonmember firms to serve the bloc via FDI. Note that this occurs even when member countries lower external tariffs ( $t_u^* < t_i^\phi$ ), so that the increase in FDI incentives is not necessarily due to tariff jumping.



### 3 Welfare Implications of a CU

In exploring the welfare implications of a CU, we examine two distinct cases.

#### 3.1 No FDI Incentives: $F \geq \bar{F}^u$

When  $F \geq \bar{F}^u$  holds, firms prefer export to FDI under both  $\langle\{ij\}\rangle$  and  $\langle\{\Phi\}\rangle$ . Let  $W_z^u$  and  $W_z^\phi$  denote the welfare of country  $z$  under  $\langle\{ij\}\rangle$  and  $\langle\{\Phi\}\rangle$ . It is easy to show that countries always have an incentive to form a CU:

$$W_i^u - W_i^\phi = \frac{71}{19} \left[ \frac{\alpha - c}{10} \right]^2 > 0 \quad (17)$$

while nonmember country ( $k$ ) is worse off:

$$W_k^u - W_k^\phi = -\frac{29}{2} \left[ \frac{3(\alpha - c)}{95} \right]^2 < 0 \quad (18)$$

Thus, when export is the only feasible mode of entry, the formation of a CU makes multilateral free trade less (more) desirable to member (nonmember) countries in a static framework.

#### 3.2 FDI Incentives under a CU: $\bar{F}^u > F \geq \bar{F}^\phi$

When  $\bar{F}^u > F \geq \bar{F}^\phi$  holds, the nonmember firm ( $k$ ) is tempted to evade tariffs via FDI under  $\langle\{ij\}\rangle$  while it still prefers export to FDI under  $\langle\{\Phi\}\rangle$ . So far, we have assumed that member countries' optimal tariffs are not affected by the nonmember firm's incentive to engage in FDI. However, by selecting appropriate tariffs, member countries can influence the equilibrium mode of entry to their markets. To this end, we distinguish between the standard optimal tariff  $t_u^*$  levied by member countries under  $\langle\{ij\}\rangle$  where only export is considered and  $t_u^f$  where the FDI incentives exist. The latter optimal tariff,  $t_u^f$ , internalizes the potential threat FDI exposes and is set just below the critical tariff level that prevents FDI by a nonmember firm:

$$\Pi_k^u(t_u^f) \geq \Pi_k^{u-f} \text{ iff } t_u \leq t_u^f = \frac{(\alpha - c) - \sqrt{(\alpha - c)^2 - 8F}}{3} \quad (19)$$

where

$$\frac{\partial t_u^f}{\partial F} = \frac{4}{3\sqrt{(\alpha - c)^2 - 8F}} > 0 \text{ and } t_u^f \leq t_u^* \quad (20)$$

Intuitively, when  $F$  gets smaller, FDI incentives become stronger and thus optimal tariff of a CU should be lowered in order to induce export over FDI. The latter part of (20) argues that the nonmember firm's FDI threat limits the effectiveness of CU's ability in levying tariffs and thus has a trade liberalization effect.

Is it optimal for member countries to induce export over FDI? Relative to the case where FDI is accommodated,  $t_u^f$  enables members to raise their profits and capture tariff revenue. These two effects are found to dominate the harmful impact of tariffs on consumers' surplus:

$$W_i^u(t_u^f) - W_i^u(I_f = 1) = \frac{(\alpha - c) \left[ \sqrt{(\alpha - c)^2 - 8F} - (\alpha - c) \right] + 19F}{36} > 0 \quad (21)$$

**Proposition 2:** *When  $\bar{F}^u > F \geq \bar{F}^\phi$  holds, (i) it is optimal for CU members to induce the nonmember firm to engage in export (rather than FDI); (ii) CU leads to Pareto improvement if  $F \leq 2\bar{F}^\phi$  where  $\bar{F}^u > 2\bar{F}^\phi \geq \bar{F}^\phi$ .*

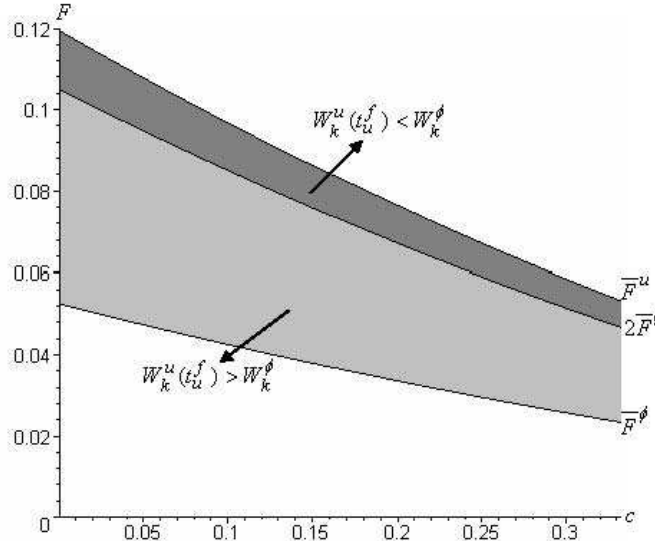


Figure 1: Pareto Improvement under CU with FDI incentives ( $\alpha=1$ )

Note that even when they are limited in imposing their optimal tariffs, member countries

benefit from exchanging preferential access in each other's market:

$$W_i^u(t_u^f) - W_i^\phi = \frac{200 \left[ (\alpha - c) \sqrt{(\alpha - c)^2 - 8F} + 19F \right] - 227(\alpha - c)^2}{7200} > 0 \quad (22)$$

Moreover, when  $F = 2\bar{F}^\phi$  holds, CU's external tariff equals Kemp-Wan tariff (1976), denoted by  $t^{KW}$ , at which a CU improves the welfare of its members relative to  $\langle \{\Phi\} \rangle$  without making the nonmember country worse off:

$$t_u^f = t^{KW} = \frac{(\alpha - c)}{5} \text{ iff } F = 2\bar{F}^\phi = \frac{21}{2} \left[ \frac{\alpha - c}{10} \right]^2 \quad (23)$$

As figure 1 indicates, since  $\frac{\partial t_u^f}{\partial F} > 0$ , the welfare implications of a CU on the nonmember country get reversed and CU leads to a Pareto improvement when  $F$  falls below  $2\bar{F}^\phi$ :

$$W_k^u(t_u^f) - W_k^\phi = \frac{21}{2} \left[ \frac{\alpha - c}{10} \right]^2 - F \geq 0 \text{ iff } 2\bar{F}^\phi \geq F \geq \bar{F}^\phi \quad (24)$$

## 4 Multilateral Cooperation under a CU

Next, we analyze the infinite repetition of the above one-shot tariff game under CU and examine the incentives of countries to multilaterally cooperate over free trade. Similar to the existing literature, multilateral tariff cooperation over free trade is modeled as a stationary repeated game where cooperation can be sustained only if it is incentive compatible for all countries. In these models, cooperation is self-enforcing in the sense that each country balances the current benefit of deviating from free trade against the future losses caused by the breakdown of multilateral cooperation that results from its defection. Countries sustain cooperation via trigger strategies so that defection by any country results in a permanent trade war wherein all countries revert to their initial tariffs. Similar to Saggi (2006), we assume that CU is permanent by nature so that members retain zero tariffs on each other even if cooperation breaks down.

To tie our results with the existing literature, next we examine the case where there exists no FDI incentives.

#### 4.1 No FDI Incentives: $F \geq \bar{F}^u$

Suppose each country employs a zero tariff until someone defects, in which case cooperation breaks down with the nonmember country switching to its MFN tariff  $t_k^\phi$  forever while member countries impose  $t_u^*$  on nonmember's export. Hereafter, let  $m$  denote member countries:  $m = i, j$ .

Defection from free trade benefits the defecting nonmember country by increasing its domestic surplus via the ability to impose optimal tariff  $t_k^\phi$ . Thus, one period benefit from defection for a nonmember country equals

$$B_k(ij) = W_k(t_k = t_k^\phi, t_m = 0) - W_k(t_z = 0) = \frac{1}{10} \left[ \frac{3(\alpha - c)}{4} \right]^2 > 0 \quad (25)$$

On the other hand, defection by member countries leads to an increase in domestic surplus as well as in export profits:

$$B_m(ij) = W_m(t_k = 0, t_m = t_u^*) - W_m(t_z = 0) = \frac{1}{38} \left[ \frac{5(\alpha - c)}{4} \right]^2 > 0 \quad (26)$$

This implies that under symmetry, if countries were to completely discount the future payoffs, the multilateral tariff cooperation would not be feasible.

Now consider the per period cost of the breakdown of cooperation:

$$C_k(ij) = W_k(t_z = 0) - W_k^u = \frac{3651}{10} \left[ \frac{\alpha - c}{76} \right]^2 > 0 \quad (27)$$

$$C_m(ij) = W_m(t_z = 0) - W_m^u = \frac{173}{38} \left[ \frac{\alpha - c}{20} \right]^2 > 0 \quad (28)$$

In order for tariff cooperation to be self-enforcing, the one period benefit from defection must be less than the discounted life-time cost of defection since defection leads to permanent multilateral trade war. In other words, the incentive compatibility (IC) constraint must hold for each country as follows:

$$B_z(ij) \leq \frac{\delta}{1 - \delta} C_z(ij) \quad (29)$$

where  $\delta$  denotes the discount factor and  $\frac{\delta}{1 - \delta} C_z(ij)$  measures the trade war's life-time cost of defection to each country under a CU. For each country, the critical discount factor  $\delta_z$  above

which cooperation over free trade is self-enforcing obtains when  $B_z(ij) \leq \frac{\delta}{1-\delta}C_z(ij)$  holds:

$$\delta_m = \frac{625}{798} \cong 0.78 > \delta_k = \frac{1083}{2300} \cong 0.47 \quad (30)$$

**Proposition 3:** *When  $F \geq \bar{F}^u$  holds,  $\delta_m > \delta_k$  obtains. Thus, multilateral cooperation over free trade is sustainable if and only if  $\delta \geq \delta_m$ .*

The above proposition suggests that when the nonmember firm has no FDI incentives, member countries are less willing to cooperate multilaterally over free trade relative to the non-member country so that the member country's choice determines whether multilateral cooperation over free trade is sustainable.

## 4.2 FDI Incentives: $\bar{F}^u > F \geq \bar{F}^\phi$

Let  $B_z^f(ij)$  and  $C_z^f(ij)$  denote the per period benefit and cost of defection when the non-member firm has FDI incentives. It is important to note that members still impose the unrestricted tariff ( $t_u = t_u^*$ ) in the defection period. Thus, benefits from defection stay the same as in (25) and (26):

$$B_z^f(ij) = B_z(ij) \text{ for all } z = i, j, k \quad (31)$$

Once multilateral cooperation breaks down, member countries internalize the potential FDI threat and lower their external tariffs on nonmember's export forever ( $t_u^f \leq t_u^*$ ) while the nonmember country switches to its MFN tariff  $t_k^\phi$ . Therefore, the cost of defection to the nonmember country falls whereas it rises for member countries:

$$C_k^f(ij) \leq C_k(ij) \text{ while } C_m^f(ij) \geq C_m(ij) \quad (32)$$

The following is immediate from (31) and (32):

**Proposition 4:** *FDI incentive of the nonmember firm makes the member countries (nonmember country) more (less) willing to cooperate multilaterally over free trade:  $\delta_k^f \geq \delta_k$  and  $\delta_m^f \leq \delta_m$ .*

We know from (30) that

$$\delta_m^f = \delta_m > \delta_k^f = \delta_k \text{ when } F = \bar{F}^u \quad (33)$$

As represented by figure 2, when  $F$  gets lower, the nonmember country (member countries) has (have) stronger (weaker) incentive to defect from cooperation since CU's external tariff gets lower ( $\frac{\partial t_u^f}{\partial F} > 0$ ):

$$\frac{\partial \delta_k^f}{\partial F} < 0, \frac{\partial \delta_m^f}{\partial F} > 0 \quad (34)$$

In other words, nonmember country has an incentive to *free ride* on trade liberalization undertaken by CU members without having to liberalize in return.

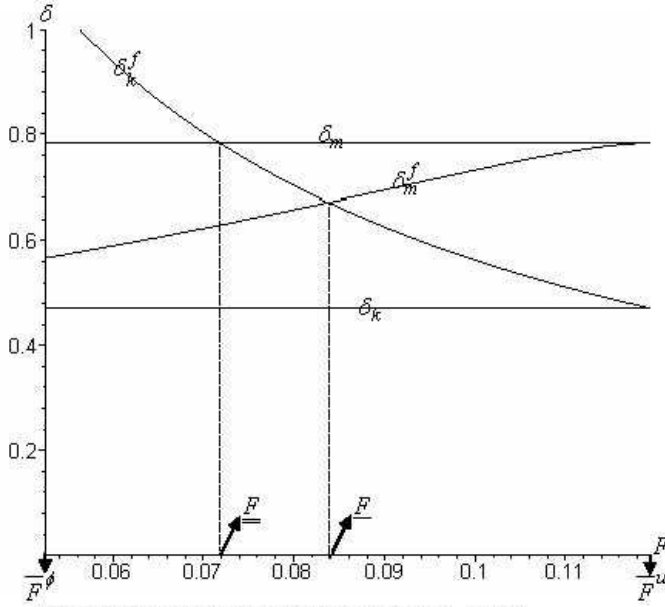


Figure 2: Critical Discount Factors ( $\alpha=1, c=0$ )

When we evaluate  $\delta_k^f$  and  $\delta_m^f$  at  $F = \bar{F}^\phi$ :

$$\delta_k^f > \delta_m^f |_{F=\bar{F}^\phi} \quad (35)$$

Given inequalities (33), (34) and (35), there must exist a critical threshold  $\underline{F}$  below which  $\delta_k^f \geq \delta_m^f$  holds and thus nonmember country's choice becomes binding for the sustainability of cooperation:

$$\delta_k^f > \delta_m^f \text{ iff } F \leq \underline{F} \text{ where } \bar{F}^u > \underline{F} \geq \bar{F}^\phi \quad (36)$$

Finally, since  $\frac{\partial \delta_m}{\partial F} = 0$  and  $\delta_k^f > \delta_m|_{F=\bar{F}^\phi}$ , it is immediate to argue that  $\delta_k^f > \delta_m$  obtains when  $F < \underline{\underline{F}}$  holds. Therefore, *the nonmember firm's FDI incentive makes multilateral cooperation over free trade harder to sustain when  $F$  is sufficiently low:  $F < \underline{\underline{F}}$ .*

## 5 Conclusion

Ever since Jacob Viner (1950) first drew attention to the issue, the economics of preferential trade agreements such as Customs Unions (CUs) has received intense scrutiny from economists and policy-makers alike. While PTAs induce significant changes in the patterns of trade and investment, the existing literature on PTAs has treated export as the only mode of entry and mostly overlooked the role of foreign direct investment (FDI). CUs, by eliminating tariffs among members, increase the incentives of nonmember countries' firms to penetrate into the expanded market (integrated area) via FDI.

Given the recent proliferation of PTAs and the large growth in FDI activities, it is important to understand the static and dynamic implications of PTAs on the trading system when FDI is an alternative mode of entry to export. To this end, we present a model where the formation of a CU gives the nonmember firm an incentive to engage in FDI while this incentive does not exist under no agreement. Under such a case, we show that CU members have incentives to strategically induce export over FDI by lowering their joint external tariffs. When fixed set-up cost of FDI is sufficiently low, this tariff falls below Kemp-Wan tariff (1976) and CU leads to a Pareto improvement relative to no agreement. This is an important result since non-member country is always worse-off under a bilateral CU when export is the only mode of entry in serving foreign markets.

Then, using a game of repeated interaction, we examine how the FDI option affects the incentives of member and non-member countries for multilateral cooperation over free trade. We find that, when FDI option is available, the nonmember country (member countries) has (have) stronger (weaker) incentive to defect from cooperation due to lower external tariffs of a CU. This implies that the non-member firm's FDI incentives make the member countries

(nonmember country) more (less) willing to cooperate multilaterally over free trade.

## References

- [1] Bagwell, Kyle, and Robert. W. Staiger, 1997, "Multilateral Cooperation During the Formation of Free Trade Areas" *International Economic Review*, 38, 291-319.
- [2] Bagwell, Kyle and Robert. W. Staiger, 1998. "Regionalism and Multilateral Tariff Cooperation." In John Piggott and Allan Woodland, eds, *International Trade Policy and the Pacific Rim*, London: MacMillan.
- [3] Bond, Eric W., Raymond G. Riezman, and Constantinos Syropoulos, 2004. "A Strategic and Welfare Theoretic Analysis of Free Trade Areas." *Journal of International Economics* 64, 1-27.
- [4] Donnenfeld, Shabtai, 2003, "Regional Blocs and Foreign Direct Investment" *Review of International Economics*, 11 (5), 770-788.
- [5] Dunning, J., (1977) "Location of Economic Activity and MNE: a Search for an Eclectic Approach, in Ohlin, B., Hesselberger, P., Wijkam, P. M. (eds.) *International Allocation of Economic Activity* (London: Macmillan).
- [6] Horstman, I. J., and J. R. Markusen, (1992) "Endogenous Market Structures in International Trade (natura facit saltum)," *Journal of International Economics* 32, 109-129.
- [7] Jaumotte, Florence, 2004, "Foreign direct investment and regional trade agreements: The market size effect revisited", International Monetary Fund Working Paper 04/206.
- [8] Kemp, Murray and Henry Jr. Wan, 1976, "An Elementary Proposition concerning the Formation of Customs Unions" *Journal of International Economics*, 6 (1), 95-98.
- [9] Markusen, J. R., (1995) "The Boundaries of Multinational Enterprises and the Theory of International Trade," *Journal of Economic Perspective* 9, 169-189.



- [10] Markusen J. R., and A. J. Venables, (1998) "Multinational Firms and The New Trade Theory," *Journal of International Economics* 46(2), 183-203.
- [11] Saggi, Kamal, 2006, "Preferential Trade Agreements and Multilateral Tariff Cooperation" *International Economic Review*, 47, 29-57.