On the Explanation of Regionalism Waves*

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From a historical perspective, the world has experienced two waves of preferential trade agreement (PTA) proliferation. The first wave was in the late 1960s when the global average tariff level was still significantly high. The second wave emerged in the mid-1990s when the global average tariff level was already quite low. This study provides a theoretical framework to explain the mechanism behind the two waves of regionalism.

Key Words: Multilateralism, Regionalism, Free Trade Area Formation.

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I. Introduction

Most of the existing literature on the multilateral versus regional (or preferential) trade liberalization explores an intriguing question of how the existence of preferential trade agreements (PTAs) affects the multilateral trade liberalization. However, Ethier (1998) and Freund (2000) investigated a reverse question of how the multilateral trade liberalization affects the formation of PTAs. Their analysis is inspired by the historical background of the PTAs formation. Freund (2000) presented a figure borrowed from Bhagwati and Panagariya (1996a) showing a massive proliferation of PTAs in the mid 90s. She conjectured that this proliferation can be attributed to the fact that the world average tariff level has been decreasing over time. She then investigated theoretically whether there is indeed a relationship between the declining tariff level and the proliferation of the PTAs. She concluded that the deeper the multilateral tariff liberalization is achieved, the easier the PTAs are formed. A similar result had been put forward earlier by Ethier (1998).

This theoretical finding has been relatively successful in providing a rationale for the current surge in regionalism within the WTO. Nevertheless, upon a careful examination of the historical development of PTAs, we notice that the theory fails to explain the previous wave of regionalism that took place during the GATT era in the late 60s. At that time, the world average tariff level was still significantly high, and yet we observe a surge in the regionalism.

Our paper attempts to provide a theoretical framework that can explain mechanism behind the two waves of regionalism. We consider a simple model of trade among countries adapted from Bagwell and Staiger’s model (1997a). Although our static model is the same as theirs, we extend their analysis to the dynamic setting. More specifically, we analyze dynamic incentives of countries to form a free trade area (FTA), instead of taking it as a given trade agreement structure. This allows us to study a richer interaction between regionalism and multilateralism.  

2) See Panagariya (1999) for a comprehensive review on multilateralism versus regionalism.
3) It is possible that these waves of regionalism might be caused by different motives and they
Using this model structure, we first derive a dynamic condition for which a global free trade can be sustained in the long run by all countries. This condition shows a *negative* relationship between the rate of time preference (or discount factor) and the sustainable multilateral tariff level. Next, we derive another dynamic condition for a pair of countries to commit to a free trade agreement in the long run. This condition shows a *positive* relationship between the discount factor and the sustainable external tariff under the FTA. We use the multilateral tariff derived from the first dynamic condition as a benchmark tariff prevailing prior to the formation of the FTA. Then, we analyze whether or not this benchmark tariff is compatible with the required external tariff derived from the second dynamic condition under the FTA.

We have the following results. First, we show that a regionalism occurs when the discount factor is high. Given a high discount factor, the first dynamic condition tells that a low multilateral tariff will prevail, which in turn can easily support the second dynamic condition for the sustainability of the FTA. This probably explains the second wave of regionalism that occurred recently during the 90s when the world average tariff was already quite low.

Second, we show that regionalism can also occur even when the benchmark multilateral tariff is high, i.e. when the discount factor is either in the middle or in the low range magnitude. Such a high benchmark of multilateral tariff makes it difficult for the pair of countries interested in forming an FTA to satisfy the second dynamic condition for the FTA formation. This is because, on the one hand, the condition requires that FTA members decrease their external tariff, but on the other hand, the existing benchmark of multilateral tariff is already sufficiently high such that it is impossible to further decrease the external tariff without violating the first dynamic condition.

Nevertheless, we show that the FTA can still potentially be implemented by the FTA members as long as all countries mutually agree to make a concession. It requires a non-FTA member to reciprocate the action of the FTA members by also reducing its external tariff. We show that under some condition the non-FTA member may indeed have an incentive to do so due to better market conditions.

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might not be related to each other. However, even if this is true, most countries nowadays engage in both forms of regionalisms simultaneously. Obviously they differ in terms of their starting points, some of them began with bilateralisms rather than multilateralism and vice versa. But any new initiative that is being contemplated on top of the existing one will have to be analyzed in conjunction with the existing initiative. This is the framework that this paper adopts.
accessibility to the FTA region. This explains the emergence of the first wave of regionalism that occurred during the 60s when the world average tariff was still relatively high.

The paper is organized as follows. Section 2 presents the basic structure of the model and the static aspect of trade agreements. Section 3 examines a formation of a free trade area and a multilateral trade agreement in a dynamic model. Section 4 and 5 analyze the two waves of regionalism. Section 6 discusses some extensions of the model. Finally, Section 7 concludes the paper.

II. The Static Model

The basic structure of our static model is borrowed from Bagwell and Staiger (1997a). We assume that there are three countries denoted by A, B, and C, and three goods by a, b, and c. Each country is endowed with only two goods out of the three goods and consumers in each country demand all of the three goods. Product endowment structure across countries are assumed to be symmetric. For example, country A is endowed with $\frac{3}{2}$ units of good b and c. Thus, the country needs to import the good a from the other two countries, and exports the good b to country B and the good c to country c. See Figure 1 for the symmetrical trade flows.

<Figure 1> The Trade Flow
Each country’s demand curve for a good is assumed to be linear and expressed as \( D(p) = \alpha - \beta p \).\(^4\) We assume that markets are perfectly competitive and free from price arbitrage. It follows that,

\[
\begin{align*}
p_a^A &= p_a^B + \tau_a^B = p_a^C + \tau_a^C \\
p_b^B &= p_b^A + \tau_b^A = p_b^C + \tau_b^C \\
p_c^C &= p_c^A + \tau_c^A = p_c^B + \tau_c^B
\end{align*}
\]

\( p_a^A \) is the price of good \( a \) in country \( A \), \( p_a^B \) is the price of good \( a \) in country \( B \), and \( \tau_a^B \) is the specific tariff imposed by country \( A \) against country \( B \)’s export \( a \). The rest of variables are interpreted in an analogous way.

Market clearing conditions for each product require that the world product endowments be equal to the world demand. That is,

\[
\begin{align*}
3 &= D_A(p_a^A) + D_B(p_a^B) + D_C(p_a^C) \\
3 &= D_A(p_b^A) + D_B(p_b^B) + D_C(p_b^C) \\
3 &= D_A(p_c^A) + D_B(p_c^B) + D_C(p_c^C)
\end{align*}
\]

\( D_A(p_a^A) \) is the demand for good \( a \) in country \( A \), \( D_B(p_a^B) \) is the demand for good \( a \) in country \( B \), and \( D_C(p_a^C) \) is the demand for good \( a \) in country \( C \). The rest of the variables are interpreted in the same way. Using (1) to (6), it is possible to obtain the market clearing price for each good in the markets. Let us indicate the market clearing price with an upper bar notation throughout. Using all of the market-clearing prices, the volume of imports and exports can be determined as follows.

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4) This demand function can be derived from the following consumers’ utility function,

\[ U = M + \sum_{a,b,c} \left[ \alpha D_a - \frac{\beta}{2} D_a^2 \right] \]

in which \( M \) denotes the money retained by consumers after spending their income on goods. The presence of \( M \) can be used to justify the partial equilibrium setting of Bagwell and Staiger (1997a) for a case of trade imbalances in product markets.
is the amount of the imports by country \( A \) given the local market price at \( p_a \), \( E^A(p_a) \) is the amount of the exports of country \( A \) to country \( B \) given the country \( B \)'s market price at \( p_b \), and \( E^A(p_c) \) is the amount of the exports of country \( A \) to country \( C \) given the country \( C \)'s market price at \( p_c \). The rest of variables are interpreted in an analogous way.

Given this basic structure of the world economy, each government protects its own importing market by choosing optimal tariffs against the rest of the world to maximize its national welfare. The national welfare is defined as the sum of consumer surplus, economic rents from product endowments, and tariff revenues in all relevant markets, that is,

\[
W^A = (CS^A_a + CS^A_b + CS^A_c) + (PS^A_b + PS^A_c) + (TR^B_a + TR^C_a) \\
W^B = (CS^B_a + CS^B_b + CS^B_c) + (PS^B_a + PS^B_c) + (TR^A_b + TR^C_b) \\
W^C = (CS^C_a + CS^C_b + CS^C_c) + (PS^C_a + PS^C_c) + (TR^A_c + TR^B_c)
\]

\( CS^A_a, CS^A_b, \) and \( CS^A_c \) indicate country \( A \)'s consumer surplus obtained from consuming good \( a, b, \) and \( c, \) respectively. \( PS^A_b \) and \( PS^A_c \) are country \( A \)'s values of the rent from the endowment of products \( b \) and \( c, \) which is a similar concept to producer surplus, and \( TR^B_a \) and \( TR^C_a \) are government \( A \)'s tariff revenue from the import of good \( a. \) The rest of variables are interpreted in an analogous way.
Since the model is symmetric, in order to see how optimal tariffs are determined, it suffices to evaluate a country’s welfare maximization problem and generalize them to other countries. Country A’s welfare function can be expressed as the following.

\[
W^A(\tau_a^B, \tau_a^C; \tau_b^A, \tau_b^C; \tau_c^A, \tau_c^B)
\]

\[
= \left\{ \begin{array}{l}
\frac{1}{2\beta} \left( 1 - \frac{\tau_a^B + \tau_a^C}{3} \right)^2 + \frac{1}{2\beta} \left( 1 - \frac{\tau_a^C - 2\tau_a^B}{3} \right)^2 \\
+ \frac{1}{2\beta} \left( 1 - \frac{\tau_a^B - 2\tau_a^C}{3} \right)^2 + \frac{3(\alpha - 1)}{\beta} + \tau_a^C - 2\tau_a^B \\
+ \frac{3(\alpha - 1)}{\beta} + \tau_a^B - 2\tau_a^C
\end{array} \right. 
\]

Country A chooses the first pair of tariffs \((\tau_a^B, \tau_a^C)\) in (13), given the second pair of tariffs \((\tau_b^A, \tau_b^C)\) of country B, and the third pair of tariffs \((\tau_c^A, \tau_c^B)\) of country C.

The first order conditions of country A’s maximization problem are,

\[
\tau_a^B = \frac{3}{22\beta} + \frac{71}{11} \tau_a^C
\]

\[
\tau_a^C = \frac{3}{22\beta} + \frac{71}{11} \tau_a^B
\]

The optimal tariff level is \(\tau_a^B = \tau_a^C = \frac{3}{8\beta} \equiv \tau^N\). Due to the symmetry of the model, this level of optimal tariff is the same for other countries as well. So, country B sets \(\tau_b^A = \tau_b^C = \frac{3}{8\beta} \equiv \tau^N\) against country A and C. Country C sets \(\tau_c^A = \tau_c^B = \frac{3}{8\beta} \equiv \tau^N\) against country A and B.
Let us suppose that country $A$ and $B$ form a free trade area. This implies that the internal-tariff levels between the two countries are $\tau_a^A = \tau_a^B = 0$. Given these zero internal tariffs, we solve for the optimal external tariff ($\tau_a^C$) that country $A$ will impose on country $C$.

$$\tau_a^C \arg \max \left[ W^A(\tau_a^B = 0, \tau_a^C, \tau_a^A = 0, \tau_b^C, \tau_c^A, \tau_c^B) \right]$$  \hspace{1cm} (19)

The solution for the optimal external tariff is,5)

$$\tau_a^C = \frac{3}{22\beta} \equiv \tau_a^{FTA}$$  \hspace{1cm} (20)

Due to the symmetry between the FTA members, the other FTA member also sets

$$\tau_b^C = \frac{3}{22\beta} \equiv \tau_b^{FTA}$$  \hspace{1cm} (21)

Now we can easily verify that country $A$ will be better off forming the FTA than discarding it when the following condition is satisfied.

$$W^A(0, \tau_a^{FTA}; 0, \tau_b^{FTA}; \tau^N, \tau^N) > W^A(\tau^N, \tau^N; \tau^N, \tau^N; \tau^N, \tau^N)$$  \hspace{1cm} (22)

As an alternative to the bilateral FTA, let us consider a case in which all countries decide to form a global free trade agreement. The free trade system can then be derived by maximizing the global welfare,

5) It is interesting to note $\tau^N > \tau_a^{FTA}$ in comparison of the optimal external tariff with and without the FTA. That is, when a country joins an FTA, it will reduce its optimal external tariff as well. In addition to Bagwell and Staiger (1997a), this finding (so called "tariff complementarity effect of regionalism") has been well documented in the literature of regional integration such as Richardson (1995), Yi (2000), and Bond, Riezman and Syropoulos (2004). The intuition is that, a decrease in its internal tariff will decrease the marginal welfare contribution of increasing its external tariff.
\[ \tau_b^B, \tau_a^C, \tau_b^C, \tau_c^B, \tau_c^C \ \arg \max \left[ W^A + W^B + W^C \right] \]  

The solutions are,

\[ \tau_a^B = \tau_a^C = \tau_b^C = \tau_c^B = \tau_c^C = 0. \]  

It implies that a country will be better off with the global free trade than without it. That is,

\[ W^A(0,0,0,0,0) > W^A(\tau^N, \tau^N, \tau^N, \tau^N, \tau^N) \]  

It is obvious from the above static analysis that it is better for a country to have either a global or a preferential free trade agreement, rather than not to engage in any free trade agreement. However, in such a one-shot static-game, it is well known that there will be a prisoner’s dilemma problem. This is because a country’s temptation to renege from a free trade agreement is high, and thus no country would have an incentive to sign any free trade agreement, even if the agreement is beneficial for them.

However, the prisoner’s dilemma can be resolved when the relationship is repeated over time. In the next section we will extend the analysis to cover the repeated game analysis of free trade agreements.

### III. The Dynamic Model

In this section, we depart from Bagwell and Staiger (1997a) by considering the question of how the multilateral trade agreement that is already in place affects the sustainability of a formation of an FTA. Thus, essentially we begin with the same question that was previously posed by Ethier (1998) and Freund (2000). However, our focus of analysis is different. Here, we seek to explain the two waves of regionalism in a unified framework.

To proceed with the analysis, first, we will derive the set of multilateral tariff
levels that can sustain the multilateral trade agreement among countries $A$, $B$ and $C$ for different values of discount factor. Second, we then analyze the formation of a free trade area (FTA) between a pair of countries. We will derive a set of the FTA’s external tariff levels that need to be imposed by FTA members in order to sustain the FTA formation. Finally, we will check whether or not the FTA’s external tariff level can be accommodated by the initially derived multilateral tariff level.

1. A Multilateral Trade Agreement

Let us assume that there is no FTA, and that in the long run all countries are trying to cooperate on a multilaterally agree-upon tariff, which is lower than the optimal non-cooperative tariff ($\tau^N$). We compare a country’s incentive to commit to the multilateral trade agreement and its incentive to renege from it.

First, due to the symmetry of the model, for simplicity we drop the notation for countries. Suppose that $\tau$ is a level of the multilateral cooperative tariff. When a country deviates from $\tau$, its one-period net welfare gains can be expressed as,$^6$

$$G = W(\tau^N; \tau^N, \tau; \tau, \tau) - W(\tau, \tau; \tau, \tau, \tau)$$ (26)

From the second period onwards, there will be retaliation by other members. They will revert back to the non-cooperative tariff level. The one-period net welfare losses for the reneging country can be expressed as, 

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$^6$ We assume here that the country will deviate against the remaining two countries at once. This assumption is motivated by the current regulation within the WTO. Currently, there is the so-called Most Favored Nation (MFN) clause which requires a country to apply a non-discriminatory policy to all other countries. Thus, if a country changes its external tariff level, then it has to impose the new external-tariff level to all countries. Also within the WTO there is the so-called Third Party Sanction (TPS) which allows countries that are not affected directly by the act of the reneging country to punish the country. Given the existence of the TPS, the one-shot gains from deviation would be higher if the country deviates against the remaining two countries at the same time.
\[ L = W(\tau, \tau; \tau; \tau; \tau) - W(\tau^N, \tau^N; \tau^N, \tau^N, \tau^N) \] (27)

Hence, the incentive constraint that will induce the country to honor the agreed-upon multilateral tariff can be easily derived as,

\[ G \leq \frac{\delta}{1 - \delta} L \] (28)

In which \( \delta \) denotes the discount factor. Substituting all the relevant tariff levels into the welfare functions (26) and (27), and then re-arranging expression (28) yield the following threshold value of \( \tau \).

\[ \tau \geq \frac{3}{8\beta} \left( \frac{4 - 7\delta}{4 - \delta} \right) = \tau^N \left( \frac{4 - 7\delta}{4 - \delta} \right) \] (29)

We define \( \tau^{WTO} \) as the lowest multilateral-tariff level that can be sustained under the multilateral trade agreement (WTO) and coin it as the WTO-Line (see Figure 2).7)

<Figure 2> The Sustainable Multilateral Tariff (WTO-line)

7) For the purpose of illustration, we use \( \alpha = 10 \), and \( \beta = 0.1 \) in all figures without loss of generality. The choice of the magnitude of \( \alpha \) and \( \beta \) has only a scale effect and does not affect the qualitative results of the paper.
All combinations of the tariff and the discount factor located on the right hand side (left hand side) of the WTO-Line can (cannot) sustain the multilateral trade agreement. The following lemma summarizes the result.

**Lemma 1.** (i) For $0 \leq \delta < 0.57$, any tariff level that is greater than $\frac{3}{8\beta} \left( \frac{4-7\delta}{4-\delta} \right)$ can be supported by all countries. (ii) For $0.57 \leq \delta \leq 1$, any tariff level that is greater than or equal to 0 can be supported by all countries.

Note that when $\delta = 0$, we have $\tau^{WTO} = \tau^N$. Thus, the only tariff level that can be supported by all countries is the non-cooperative tariff level ($\tau^N$). When $0 < \delta \leq 1$, the countries would agree on the lowest level of the multilateral cooperative tariff. The following corollary summarizes the results.

**Corollary 1** (i) For $0 \leq \delta < 0.57$, countries joining the multilateral tariff cooperation agree to set $\tau^{WTO} = \frac{3}{8\beta} \left( \frac{4-7\delta}{4-\delta} \right)$. (ii) For $0.57 \leq \delta \leq 1$, they agree to set $\tau^{WTO} = 0$.

**Proof.** The proof is relegated to appendix A1.

The discount factor $\delta$ determines the incentive of countries to whether or not deviate from the multilateral agreement given that they have already commit to the tariff set under FTA. To agree on a low multilateral tariff, countries have to be sufficiently patient otherwise the temptation to deviate will simply be too big to ignore.

2. A Free Trade Area Formation

As an alternative to the multilateral trade agreement, let us suppose that countries $A$ and $B$ are forming a free trade area with a zero internal tariff level, $\tau^A_b = \tau^B_a = 0$. Due to the symmetrical nature of the model, the initial tariff levels of all countries are the same at, say, $\tau$. Furthermore, without loss of generality, we assume that when an FTA member deviates from the FTA, it sets an optimal
internal tariff, denoted by $\tau^D$, that maximizes the national welfare.\(^8\) It is straightforward to express the first order condition of this welfare maximization as,

$$\tau^D = \frac{3}{22\beta} + \frac{7}{11}$$ \hspace{1cm} (30)

Note that this is the very same condition as in (17). With this deviation tariff level imposed against the other FTA member, the one-period net welfare gains obtained are,\(^9\)

$$G^{FTA} = W^{FTA}(\tau^D; \tau; 0, \tau, \tau, \tau) - W^{FTA}(0, \tau; 0, \tau, \tau, \tau)$$ \hspace{1cm} (31)

From the second period onwards, the other FTA member will retaliate by imposing $\tau^D$ as well. Thus, the one-period net welfare losses from a deviation are,

$$G^{FTA} = W^{FTA}(0, \tau; 0, \tau, \tau, \tau) - W^{FTA}(\tau^D, \tau; \tau^D, \tau, \tau, \tau)$$ \hspace{1cm} (32)

Hence, the incentive constraint that will keep FTA members honoring the zero internal FTA tariff can be easily derived as,

$$G^{FTA} \leq \frac{\delta}{(1 - \delta)} L^{FTA}$$ \hspace{1cm} (33)

This condition yields the following set of the required level of external tariff for the sustainable FTA.

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8) Later in section 6, we will analyze a status quo deviation and compare the results with the one using the optimal deviation.
9) Here, we denote the FTA member countries $A$ and $B$ by simply $FTA$. 

Let us define $\tau^{FTA}$ as the highest external-tariff level required to sustain the FTA and coin it as the FTA-Line (see Figure 3).

The following lemma summarizes the result regarding the required external tariff for the sustainable FTA.

**Lemma 2.** (i) For $0 \leq \delta < 0.275$ the external tariff that will sustain the FTA formation is 0. (ii) For $0.275 \leq \delta \leq 1$, all external tariffs that are greater than or equal to $\frac{3}{2\beta} \left( \frac{11 - 40\delta}{16\delta - 77} \right)$ will sustain the FTA formation.

**Corollary 2** (i) For $0 \leq \delta < 0.275$ the FTA members would choose $\tau^{FTA} = 0$. (ii) For $0.275 < \delta \leq 1$, the FTA members would choose $\tau^{FTA} = \frac{3}{2\beta} \left( \frac{11 - 40\delta}{16\delta - 77} \right)$. 

\[ \tau \leq \frac{3}{2\beta} \left( \frac{11 - 40\delta}{16\delta - 77} \right) \]
Proof. The proof is relegated to A2 in the appendix.

Note that, throughout the paper we assume that the discount factor (discount rate) is an inherent fixed attribute of a country, and as such it does not change overtime. A caveat is, therefore, in order. If we assume that the discount factor changes overtime, one may argue that the period of 1990s signified such a change, because in this period countries seemed to adopt a longer term policy horizon with increased predictability of economic policies. Whether or not indeed the discount factor has changes is an empirical question and such an analysis is beyond the scope of this paper. If, however, it is true, then the explanatory power of result shown in Lemma 2 is weakened.

IV. The Interaction between Multilateralism and Regionalism

In order to analyze the interaction between multilateralism and regionalism, we present the following figure which combines the two figures derived previously (WTO-Line and FTA-Line).

<Figure 4> Interaction between Multilateralism and Regionalism
The interpretation of the figure is quite straightforward. Region I represents combinations of tariff and discount factor that cannot sustain both the multilateral trade agreement and the FTA formation. Region II represents combinations of tariff and discount factor that can only sustain the multilateral trade agreement, but not the FTA formation. Region III corresponds to combinations of tariff and discount factor that can support both the multilateral trade agreement and the FTA formation. Finally, region IV depicts the combinations of tariff and discount factor that can sustain the FTA formation only. The crossing point between the two lines is 0.41, which is denoted by $\delta^D$.

1. The Second Wave of Regionalism

See Figure 4 and suppose that a discount factor is fixed at $\delta = 0.45 > \delta^D$. Using Lemma 1, it can be verified that any tariff above 0.9 can support the multilateral trade agreement. Note that 0.9 is the corresponding tariff level on the WTO-Line. On the other hand, from Lemma 2, it can be verified that any tariff below 1.5 can support the FTA formation. Note that 1.5 is the corresponding tariff level on the FTA-line. It is then obvious that all external tariffs within the range of $0.9 \leq \tau \leq 1.5$ can be accommodated by the existing multilateral trade agreement. The prevailing level of the multilateral tariff is 0.9, because this level gives the highest global welfare among other tariff levels within the supportable range, $\tau^{WTO} \geq 0.9$ (see Corollary 1). It is easy to see that this multilateral tariff will not violate the incentive constraint for the FTA formation, and thus it implies that the multilateralism lends support to the regionalism.

Let us now suppose that countries have a higher discount factor. For this purpose, let us consider the case of $\delta = 0.7$. According to Lemma 1, any tariff greater than or equal to 0 can support the multilateral trade agreement when $\delta = 0.7$. As it is argued in corollary 1, the level of tariff that will prevail is 0. Hence, we can see that as countries’ discount factor is higher, the lowest multilateral tariff becomes lower. It implies that it becomes a lot easier for the FTA members to support the FTA because the range of the required external tariff that can be supported becomes wider. The following proposition summarizes the result.
**Proposition 1** *(the second wave of regionalism) (i) As the discount factor increases (decreases), the multilateral tariff level decreases (increases). (ii) A lower multilateral tariff level facilitates the formation of the FTA, vice versa.*

The above results can be used to justify the second wave of regionalism that emerged in the mid 90s. In the mid 90s, the average multilateral tariff level had been decreasing significantly below 5%, and at the same time we also witness a massive proliferation of FTAs.\(^\text{10}\)

Two things are noteworthy. First, we have shown that when \(\delta = 0.45\) the corresponding multilateral tariff level is 0.9. Meanwhile, all external-tariff levels within the range of \(0.9 \leq \tau \leq 1.5\) can sustain the FTA formation without violating the incentive constraint for the multilateral trade agreement. It is then interesting to analyze what level of external tariff will be chosen by the FTA members. It is easy to verify that the FTA members would prefer to impose \(\tau^{FTA} = 1.5\). This is because this tariff level maximizes its national welfare. However, on the basis of the current regulation governed by the WTO-Article 24, such an increase in the external tariff after a formation of an FTA is not allowed. Indeed, it would be interesting to investigate the effect of the WTO-Article 24 on the FTA members’ incentive to increase their external tariff against a non-member country. However, this is beyond the focus of this paper. Hence, for the purpose of our analysis, we will just assume that the existence of the WTO-Article 24 prevent the FTA members to set \(\tau^{FTA} = 0.9\).

Second, we have shown that an FTA formation with an internal tariff which is equal to zero and an external tariff level which is as high as the multilateral tariff level can be easily sustained when the discount factor is high. However, we do not formally show the effect of this FTA formation on the next round of the multilateral tariff cooperation. One would think that such an FTA formation will probably change the ‘original’ incentive of the countries to sustain the multilateral tariff cooperation. The original multilateral tariff level may not be sustainable any more under the ‘new’ multilateral incentive constraint. Unfortunately, a formal analysis to investigate this issue is difficult to implement within our model setting. If the FTA formation changes countries’ incentive to sustain the multilateral trade agreement, then the new multilateral tariff

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\(^{10}\) The results are consistent with Freund (2000), which argues that as the multilateral trade agreement succeeds in reducing the multilateral tariff level, it is more likely that the regional free trade agreements such as FTAs and CUs are formed.
incentive constraint should also change the incentive of the FTA members to sustain the FTA. This, in turn, will change the countries’ incentive to sustain the multilateral trade agreement. Thus, we have a recursive process that makes the lowest bound of the multilateral tariff level not tractable. Such a recursive process can only be analyzed within a full dynamic system, which is beyond the scope of this paper.11)

Nevertheless, having said this, we conjecture that the new external tariff levels under the FTA can still sustain the existing multilateral trade agreement. This can be explained as follows. Under the FTA formation, the FTA members will definitely benefit from it. Otherwise they will not sign such an agreement in the first place. Furthermore, the resulting external tariff level is the same as the one that is stipulated under the existing multilateral tariff agreement. The only adverse effect is the ‘trade-diversion’ effect that is experienced by the non-member. However, from the non member point of view, it will still be better off keeping the existing multilateral tariff cooperation intact rather than quitting from the multilateral tariff cooperation. This is because the non member’s welfare with a multilateral tariff cooperation (which results in a lower multilateral tariff level than the non-cooperative tariff level) is still higher than its welfare without such a cooperation.

2. The First Wave of Regionalism

Suppose that the discount factor is $\delta = 0.37 < \delta^D$. Then it can be seen from Figure 4 that the corresponding level of $\tau_{WTO}$ is 1.93 and the external tariff level that satisfies the incentive constraint for the FTA formation is $\tau^{FTA} = 0.8$. Since $0.8 < 1.93$, it is obvious that the initial level of the multilateral tariff level ($\tau_{WTO} = 1.93$) cannot support the FTA formation.

Consequently, if we want to have the FTA formation taking place, there have to be either, a unilateral reduction in the external-tariff level imposed by the FTA members on the non-member, or another round of multilateral trade negotiation that will somehow bring down the multilateral tariff even further. In the next sub-sections, we investigate under what conditions the FTA formation will induce either a unilateral reduction in external tariff level or a

11) A recent paper by Bond et al. (2001) is an example of a paper which aims to deal with this caveat using a different model framework from ours.
further round of multilateral trade negotiation.

1) A Unilateral External-Tariff Reduction by FTA Members

Let us suppose that the non-member does not want to change its external tariff level imposed on the FTA members. Hence, the only available option for the FTA members, if they want to proceed with the FTA formation, is to unilaterally reduce their external tariff imposed on the non-member. Obviously, such a unilateral tariff reduction gives members a lower welfare than the welfare obtained under a multilateral reduction. However, if such a reduction in members’ welfare is still outweighed by an increase in members’ welfare brought about by the FTA formation, then such a unilateral external tariff reduction will still take place.

To illustrate this case, let us re-consider the previous example of $\delta = 0.37$. If the FTA members disband the FTA formation, then they set their tariff level according to the WTO-line, which is $\tau^{WTO} = 1.93$. Alternatively, if they decide to go along with the FTA formation, then they need to set their external tariff level according to the FTA-line. This implies that $\tau^{FTA} = 0.8$. We assume that the non-member keeps its initial external-tariff level imposed on the FTA members, which is 1.93.\footnote{We assume common knowledge here. Thus, when the FTA members are willing to unilaterally reduce the external-tariff, then the non-member will be informed. Given this assumption, when the unilateral reduction is feasible, then the nash-equilibrium is characterized by the FTA members reducing their external-tariff unilaterally and the non-member keeping its external-tariff intact.}

Next, we compare the FTA members’ welfare under the two cases. An FTA member’s welfare accrued under a unilateral external tariff reduction can be straightforwardly calculated as follows.

$$W^{FTA}(0,0.8; 0,0.8; 1.93,1.93) = 285$$  \hfill (35)

Its welfare accrued from disbanding the FTA formation can be calculated as follows.

$$W(1.93,1.93; 1.93,1.93; 1.93,1.93) = 284.93$$  \hfill (36)
Since \( W^{FTA} = 285 > W = 284.93 \) it implies that the FTA members are better off sustaining the FTA formation rather than disbanding it.

To see this more generally, we find out the cutoff point of the discount factor (\( \delta \)) that makes the two choices are equivalent for the FTA members. For the purpose of our analysis, in the case of ‘keeping the FTA formation intact and unilateral reduction in the external-tariff’, we use two sets of external tariffs, that is \( \tau^{FTA} = \frac{3}{2\beta} \left( \frac{11 - 40\delta}{16\delta - 77} \right) \) for all \( \delta \in [0.275, \delta^D] \), and \( \tau^{FTA} = 0 \) for all \( \delta \in [0,0.275] \). Notice that \( \delta = 0.275 \) is the value of discount factor at the intersection of the FTA-Line and the horizontal axis in Figure 4. Meanwhile, in the case of ‘disbanding the FTA formation and returning to the WTO’, we use \( \tau^{WTO} = \frac{3}{8\beta} \left( \frac{4 - 7\delta}{4 - \delta} \right) \). Next, let us define a function, \( \gamma \) as follows\(^{13})\),

\[
\gamma = W^{FTA}(0,\tau^{FTA},0,\tau^{FTA},\tau^{WTO},\tau^{WTO}) - W(\tau^{WTO},\tau^{WTO},\tau^{WTO},\tau^{WTO},\tau^{WTO},\tau^{WTO})
\]

We then plot \( \gamma \) function against the discount factor (see Figure 5).

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\(^{13})\) See A3 in the appendix for calculations.
The cutoff discount factor ($\delta^*$) that leads to $\gamma = 0$ is $\delta^* = 0.34$, which is smaller than $\delta^D = 0.41$. It is then easy to see that when $0.34 \leq \delta \leq 0.41$, we have $\gamma \geq 0$. This implies that the FTA members are willing to unilaterally reduce their external tariff level in order to sustain the FTA formation. This is because the benefits of forming the FTA outweigh the costs of having to reduce their external tariff level imposed on the non-member. However, when $0 \leq \delta \leq 0.34$, it follows that $\gamma < 0$. This implies that the FTA members will disband their plan to form the FTA because the costs of having to reduce their external-tariff level exceeds the benefits of forming the FTA.

The following proposition summarizes the above results.

**Proposition 2 (the unilateral external-tariff reduction)** (i) If $0 \leq \delta \leq \delta^*$, then the FTA formation will not take place. (ii) However, if $\delta^* < \delta \leq \delta^D$, then the FTA formation will take place because the FTA members are willing to unilaterally reduce their external-tariff level imposed on the non member.

The results provide an explanation for the first wave of regionalism. During 60s, we observed that the world average tariff level was significantly high. In our model, this period of time corresponds to the case of $\delta \leq \delta^D$ which leads to a high multilateral tariff level. This proposition stresses that even when the discount factor is high, i.e. $\delta^* \leq \delta \leq \delta^D$, such that the multilateral tariff level is quite high, the formation of an FTA can still take place.

However, having said this, we notice that for the case of $0 \leq \delta \leq \delta^*$, the FTA members are not willing to unilaterally liberalize their external tariff. This is because the costs exceed the benefits of taking such an action. It also implies that the external-tariff reduction, which is required to sustain the FTA formation, will only take place when all countries (the FTA members and the non member) agree to mutually reduce their external-tariff level. In other words, there should be reciprocity in the external-tariff reduction among countries. The next section analyzes this case further.
2) A Reciprocal External-Tariff Reduction by All Countries

To start with, let us assume that \( \delta = 0.2 \), and thus \( 0 \leq \delta < \delta^* (= 0.34) \). Next, we consider the FTA member’s welfare change when the non-member is willing to reciprocate the external-tariff reduction. Recall that the internal-tariff level between the two FTA-members is zero. With \( \delta = 0.2 \), the corresponding external tariff level is also zero (see the FTA-line in Figure 4). Consequently, both internal and external-tariff levels set by the FTA members are zero. With \( \delta = 0.2 \), the non-member sets \( \tau \in [0, 2.57] \). Note that 2.57 is the corresponding point of the WTO-line when \( \delta = 0.2 \) (see also Figure 4). We can then easily calculate the FTA members’ welfare when they reduce their external-tariff level imposed on the non-member given that the non-member also reciprocates by setting \( \tau \in [0, 2.57] \)

\[
W^{FTA}(0, 0; 0, \tau) = 285 - 0.17\tau + 0.006\tau^2 \tag{37}
\]

As an alternative, the FTA members can opt to disband the FTA formation plan and stick with the initial multilateral tariff agreement. Thus, their external-tariff level will be 2.57. The FTA member’s welfare under this alternative case can be expressed as,

\[
W^{FTA}(2.57, 2.57; 2.57, 2.57; 2.57; 2.57; 2.57) = 284.78 \tag{38}
\]

Next, we compare (37) and (38) and derive \( \omega \)-function which represents the difference between the two welfare levels.

\[
\omega \equiv W^{FTA}(0, 0; 0, \tau) - W^{FTA}(2.57, 2.57; 2.57, 2.57; 2.57; 2.57; 2.57)
\]

\[
= 0.22 - 0.17\tau + 0.006\tau^2 \tag{39}
\]

The plot of the above expression is given in Figure 6.
The figure shows that when the non-member reduces its external-tariff level from 2.57 to $\tau \leq 1.4$, then the FTA members would indeed carried out the FTA formation and reduce their external tariff imposed on the non-member to 0. However, we assume here that the non-member is willing to reciprocate, i.e. to reduce its external-tariff level imposed on the FTA members given that FTA members reduce their external-tariff imposed on the non-member to 0. The following analysis will investigate under what conditions this assumption will hold.

When the non-member reduces its external tariff to $< 2.57$, its welfare can be derived as follows.

$$W_{\text{non-FTA}}(\tau; \tau; 0; 0; 0) = 285 + 0.33\tau - 0.04\tau^2$$

(40)

Suppose that the non-member is not willing to reciprocate and sticks to $\tau = 2.57$. Obviously, the FTA members will not have an incentive to form the FTA when the non-member is not willing to reciprocate, and hence they will prefer to stick to $\tau = 2.57$ as well. This yields the following welfare,

$$W_{\text{non-FTA}}(2.57, 2.57; 2.57, 2.57; 2.57, 2.57) = 284.78$$

(41)
Next, we define $\varepsilon$-function as the difference between (40) and (41).

$$
\varepsilon = W^{non-FTA}(\tau, \tau; 0, 0; 0, 0) - W^{non-FTA}(2.57, 2.57; 2.57, 2.57; 2.57) \\
= 0.22 + 0.33\tau - 0.04\tau^2 
$$

(42)

We then plot it together with $\omega$-function that was previously derive (see Figure 7).

<Figure 7> The Reciprocal Reduction in the External Tariff

This figure shows that when the FTA members reduce their external-tariff to 0 in order to sustain the FTA formation plan, the non-member is always willing to reciprocate the action by also reducing its external tariff below 2.57. This result can be easily generalized for any $0 \leq \delta \leq \delta^*$. 

**Proposition 3 (the reciprocity effect of a tariff-reduction)** If $0 \leq \delta \leq \delta^*$, then the FTA members would carry out the plan of forming the FTA if and only if the non-member is willing to reciprocate their action by also reducing its external-tariff. Given $0 \leq \delta \leq \delta^*$, the non-member would indeed have an incentive to reduce its external-tariff.
The proposition provides a justification for the first wave of regionalism. That is, even when the initial multilateral tariff is very high (due to a low discount factor), there may still be a room for FTAs’ proliferation, provided that there is a further multilateral trade negotiation that can result in a further reduction in the multilateral tariff. Indeed, if we examine the historical development of the PTAs formation, we observe that during the first wave of PTAs formation the average multilateral tariff continued to fall. On the basis of our theory, we can argue that the subsequent downfalls in the average multilateral tariff are partly attributed to the proliferation of PTAs.

V. Extensions

1. The Status Quo Deviation

We have assumed so far that when an FTA member deviates from the FTA, it will set $\tau^D = \frac{3}{22\beta} + \frac{7}{11} \tau$. We called $\tau^D$ as the optimal deviation. As an alternative to this, an FTA member may deviate by setting the status-quo level of tariff $\tau$. Let us denote it by $\tau^S = \tau$. The following figure compares $\tau^D$ and $\tau^S$.

<Figure 8> A Comparison between the Optimal and Status Quo Deviation
This figure shows that when the multilateral tariff level is below 3.75, the optimal deviation tariff is higher than the status-quo deviation tariff. On the contrary, when the multilateral tariff level is above 3.75, the opposite is true.

The difference in the two deviation-tariff levels changes an FTA member’s incentive to sustain the FTA formation plan. This is because it affects both gains and losses from a deviation. An FTA member’s incentive constraint when the deviation tariff is the status-quo tariff can be straightforwardly derived as follows.

\[
G_{status-quo}^{FTA} \leq \frac{\delta}{1-\delta} L_{status-quo}^{FTA} \iff r_{status-quo}^{FTA} \leq \frac{2\delta-1}{\beta} \tag{43}
\]

Plotting this new incentive constraint and adding the plot into Figure 4 yields the following figure.

From an inspection of Figure 9, it is obvious that using the status-quo deviation tariff does not affect our qualitative results. Nevertheless, in the status-quo deviation-tariff case, the role of further multilateral tariff negotiations becomes more important than in the optimal deviation-tariff case. This is apparent from the increase size of region I.
2. Asymmetric Trade (Transport) Costs

Some researchers have argued that low transport costs will actually facilitate the formation of the preferential trading blocs. They support the argument by citing a stylized fact that such trading blocs are often formed among countries that are geographically proximate. However, in our model we assume that there are no natural costs of trade among countries. Also in analyzing the formation of an FTA, we chose an arbitrary pair of countries among the three countries in the model. Thus, one may raise a question on the role of asymmetric trade costs (or transport costs) on countries’ incentive to form an FTA within our model framework. In this section, we provide a qualitative discussion on this aspect using the results obtained by Panagariya (1998) and Bhagwati and Panagariya (1986a). In their analysis, they consider transport costs together with production costs. A more extensive analysis of this issue is beyond the scope of the current paper.

Panagariya (1998) argues that distant countries in East Asia can effectively compete with Latin American countries in the U.S. market. This is because the advantage of the lower transport costs for Latin American countries may be outweighed by the higher production costs in those countries. This may explain why transport costs may not be the only major reason for countries to form a preferential trading bloc.

Even if there is no difference in production costs, a country may achieve a better outcome by giving a trade preference to a distant country rather than to a nearby country [Bhagwati and Panagariya (1996a)]. This is because with initial symmetric non-discriminatory tariff levels, a country imports less from its distant trade partner than from its nearby trade partner. Hence, such a trade preference to the distant partner leads to a smaller amount of tariff revenue than that will be received when the trade preference is given to a proximate country. This implies that, ceteris paribus, trading blocs may be formed among countries which are distant. This is because the loss from such a preferential trade treatment (in term of the loss in the tariff revenue) given to a distant trade partner is relatively small compared to the loss from a preferential trade treatment given to a nearby country.

VI. Conclusion

This paper is motivated by a historical finding on regionalism. From the historical perspective, the world has experienced two waves of PTAs’ proliferation. The first wave surfaced in the late 60s when the world average tariff level was still significantly high. The second wave emerged in the mid 90s when the world average tariff level was already quite low. This paper attempts to offer a theoretical framework that can explain both regionalism waves.

First, we show that a low multilateral tariff level facilitates the formation of an FTA. This finding is consistent with Ethier (1998) and Freund (2000). Second, even when the multilateral tariff is high, we show that the FTA member might still have an incentive to preserve the FTA provided that the FTA members can either reduce unilaterally its external tariff level or cooperate with the non member to reciprocally reduce their external tariff level. Throughout the analysis of this paper, we show that the discount factor plays an important role as the driving force behind the sustainability of the FTA formation plan.

For future research, we intend to use the framework developed here to analyze a formation of a customs union (CU). A CU is a preferential trading agreement in which members jointly decide their external tariff level. This implies that members of a CU have more bargaining power than members of an FTA in negotiating the multilateral tariff level with non-members. This may imply that the formation of a CU may not be as much feasible as the formation an FTA under the multilateral tariff negotiation. This could be the reason why recent PTAs during 90s are mostly in the form of FTAs rather than CUs.
A1: Proof for Corollary 1

First, for the range of discount factor $0 \leq \delta < 0.57$, we need to show that, for any $\tau_{WTO}^{*}$ which is greater than $\tau_{WTO} = \frac{3}{8\beta} \left( \frac{4 - 7\delta}{4 - \delta} \right)$, the following inequality should hold.

$$W(\tau_{WTO}^{*}, \tau_{WTO}; \tau_{WTO}, \tau_{WTO}; \tau_{WTO}, \tau_{WTO})$$

Indeed, this inequality holds for any $\tau_{WTO}^{*} > \tau_{WTO}$. As an example, suppose that $\delta = 0.45$. The corresponding $\tau_{WTO}$ is 0.9. Without loss of generality, we use $\alpha = 10$, and $\beta = 0.1$ for all numerical evaluations. Next let us choose $\tau_{WTO}^{*} = 1.5$ which implies that $\tau_{WTO}^{*} > \tau_{WTO}$. It is easy to see that we have,

$$W(\tau_{WTO} = 0.9) - W(\tau_{WTO}^{*} = 1.5) = 0.05 > 0$$

This relationship is true for all discount factors within the range of $0 \leq \delta < 0.57$.

Second, using the same logical approach, we can show that for $0.57 \leq \delta \leq 1$ the actual agreed-upon multilateral tariff level is $\tau_{WTO} = 0$.

A2: Proof to Corollary 2

First, for the range of discount factor $0.275 \leq \delta < 1$, we need to show that, for any $\tau^{FTA}$ which is smaller than $\tau^{FTA} = \frac{3}{2\beta} \left( \frac{11 - 40\delta}{16\delta - 77} \right)$, the following inequality should hold.

$$W^{FTA}(0, \tau^{FTA}; 0, \tau^{FTA}; \tau, \tau) - W^{FTA}(0, \tau^{FTA}^{*}; 0, \tau^{FTA}^{*}; \tau, \tau) > 0$$
Indeed, this inequality holds for any $\tau^{FTA^*} < \tau^{FTA}$. As an example, let us suppose that $\delta = 0.5$. The corresponding external tariff $\tau^{FTA}$ is 1.96. Now choose any $\tau^{FTA^*} < \tau^{FTA}$, say $\tau^{FTA^*} = 1$. Then we obtain,

$$W^{FTA}(\tau^{FTA} = 1.96) - W^{FTA}(\tau^{FTA^*} = 1) = 0.16 > 0$$

This relationship is true for all discount factors within the range of $0.275 \leq \delta \leq 1$.

Second, for the case of $0 \leq \delta < 0.275$, it is easy to show the FTA members would like to impose $\tau^{FTA} = 0$ since we restrict our attention only to non-negative external-tariff levels.

A3: The $\gamma$ Function

With $\alpha = 10$, and $\beta = 0.1$ as before, find $\tau^{FTA} = 15\left(\frac{11 - 40\delta}{16\delta - 77}\right)$ and $\tau^{WTO} = 3.75\left(\frac{4 - 7\delta}{4 - \delta}\right)$. Then, for $\delta > 0.275$, the following two welfare functions can be derived.

$$W^{FTA}(\tau^{FTA}, \tau^{FTA}; 0, \tau^{FTA}; \tau^{WTO}, \tau^{WTO}) = \frac{3}{128} \left(\frac{8104536\delta + 121425920 - 4630293\delta^2 + 327680\delta^4 - 5775360\delta^3 + 38063360\delta^2}{-6685008 - 111175680\delta + 1219872\delta^3 - 115968\delta^3} \right)$$

$$W^{WTO}(\tau^{WTO}, \tau^{WTO}; \tau^{WTO}, \tau^{WTO}; \tau^{WTO}, \tau^{WTO}) = \frac{3}{64} \left(\frac{97120 - \delta(48080 - 5590\delta)}{(\delta - 4)^2}\right)$$
We use these two functions to evaluate $\gamma$ for $\delta \geq 0.275$.

Next, for a level of $\delta < 0.275$, note that $\tau^{FTA} = 0$ and $\tau^{WTO} > 0$. Using these values, we can derive the welfare of an FTA member as:

$$W^{FTA}(0, 0; 0.0; \tau^{WTO}, \tau^{WTO}) = \frac{1}{128} \left( \frac{\delta(1736 - 199\delta) + 384\alpha(\delta - 4)^2 - 3184}{(\delta - 4)^2 \beta} \right)$$

Using $W(\tau^{WTO}, \tau^{WTO}; \tau^{WTO}, \tau^{WTO}; \tau^{WTO}, \tau^{WTO})$, we can derive $\gamma$ for $0 \leq \delta \leq 0.275$. Using all of these results we can produce Figure 5.
References


