Global Free Trade: Regionalism as a Building Block or a Stumbling Block?

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Abstract

This paper examines the roles of regionalism in the possible movement to global free trade (GFT). It argues that whether regionalism is a building block or is a stumbling block to reaching GFT depends on the technologies, preferences, endowments, and other characteristics of the countries concerned. In addition to illustrating this point, this paper derives the conditions for the building-block case or the stumbling-block case in a simple model of differentiated products and intraindustrial trade. Our results clarify some of confusion in the literature, and help us understand better possible roles of regionalism.

1 Introduction

The last two decades witnessed a surge in the number of preferential trade arrangements (PTAs) such as customs unions (CU) and free trade agreements/areas (FTA). As of July 2007, World Trade Organization (WTO) has received 380 notifications of regional trading agreements (RTAs), 205 of which are in force. RTAs, despite violating the most-favored-nations principle, are permitted by the WTO under certain conditions.

The surge in the number of RTAs occurred at a time when the multilateral trade negoations organized by the WTO, the so-called Doha round of trade talks, seem to have stalled. People who are avocating trade liberalization are getting more and more pessimistic about the possibility of achieving global free trade (GFT) eventually. In many people's mind, it seems to be more and more likely that RTAs are "stumbling blocks" for countries to reach GFT. Such sentiments have been summarized by Bhagwati (1991): Is regionalism a "building block" that help multilateralism or a "stumbling block" to hinder global free trade?[1] He suggests that even when PTAs are welfare-improving in static they may decrease the viability of further trade liberalization.

The theoretical literature has no concensus on the answer to this question. Levy (1997) finds that the bilateral free trade agreement in a differentiated-product model may jeopardize the multilateral trading system, and Krishna (1998) and McLaren (2002) show that multilateral liberalization that is initially feasible could be rendered infeasible by preferential arrangements. Bhagwati and Krueger (1995), and Bhagwati and Panagariya (1996) also view that the rise of PTAs can be a serious threat to the multilateralism by leading to trade discrimination. On the other hand, Baldwin (1995) finds that regionalism promotes and fosters multilateral trade liberalization by raising the incentives of outside countries to join the existing trading bloc. Ethier (1998), Cadot et al. (2001), Freund (2000, 2001) and Ornelas (2005) suggest that regionalism provides the path to global free trade. Bagwell and Staiger (1997) show that FTAs are stumbling blocks in transition but building blocks in the long run.[2] However, Saggi and Yildiz (2007) mention that unlike that of the "stumbling block", the meaning of the building block is not clear: It can mean that bilateral trade liberalization eventually lead members

[1] See Panagariya (2000) for a recent survey of this literature.

[2] They show that the two countries raise the tariffs due to the smaller cost along with expected trade diversion before they form an FTA with another country, but after the FTA, they decide to lower tariff due to smaller trade flows.

to global free trade so that regionalism can be a building block as long as it does not derail the process of global free trade (weak building block), or it can mean that global free trade can only be attained with pursuit of PTAs (strong building block).[3] Using an oligopoly model of intra-industry trade, Aghion et.al (2007) analyze the building block and the stumbling block effects of FTAs, and show that global free trade is not achieved if political-economy motives are large enough.

This paper examines the roles of regionalism in the possible path to GFT. By allowing countries to form FTAs in various stages, this paper carefully analyzes the options to different countries and their choices. The first question for us is, are countries interested in allowing GFT? If at least some countries are not interested in having GFT, could successive FTAs bring countries to GFT? Even if all countries believe that GFT is Pareto welfare-improving, could it be possible that GFT will not be reached? In other words, would it be possible that some of the countries prefer an FTA among themselves to GFT so that eventually GFT will not be reached? In answering the above questions, we investigate patiently various cases to see whether regionalism is a building block or it is a stumbling block to GFT.

To analyze what roles regionalism play, we distinguish two ways of reaching GFT: through multilateral trade negotiations and through the formation, expansion, and addition of FTAs. We call the first way the WTO path and the second way FTA path. We say that a path is feasible if GFT is reached ultimately; or it is infeasible. The issue being analyzed in the present paper will not be an issue if both paths are feasible or if both paths are infeasible. Thus in this paper, we focus on the cases in which the WTO path is feasible but the FTA path is not, and the cases in which the FTA path is feasible but the WTO path is not. For our analysis, we thus say that regionalism is a building block to GFT if the WTO path is infeasible but the FTA path is feasible, and that regionalism is a stumbling block if the WTO path is feasible, if the FTA path is infeasible, and if some countries choose to form FTAs. The latter case is the cause of pessimism among some economists and policy makers in the face of rising popularity of FTAs.

This paper argues that whether regionalism is a building block or is a stumbling block depends on the technologies, preferences, endowments, and other characteristics of the countries concerned. In addition to illustrating this point, this paper derives the conditions for the building-block case and

[3] They also argue that a majority of existing literature take the former view.

the stumbling-block case in a simple model of differentiated products and intraindustrial trade. Our results clarify some of confusion in the literature, and help us understand better possible roles of regionalism.

In Section 2, we introduce the basic model of intraindustrial trade, which is an extension of the work of Krishna (1998). Section 3 explains the WTO and FTA paths to GFT. Section 4 derives conditions for regionalism to be a building block to GFT, while section 5 focuses on the cases in which regionalism is a stumbling block. Section 6 concludes.

2 The Model

Consider a model with two goods consumed and produced in three countries, the latter being labelled x, y, and z. The numeraire good is produced by competitive firms, and a homogeneous good produced by n_i identical oligopolist firms in country i, $i = x, y, z$. Trade with zero transport cost is allowed among the countries, with possibly non-prohibitive tariffs. For simplicity, it is assumed that all countries have the same number of oligopolistic firms, $n_x = n_y = n_z = n$.

The oligopolistic market is characterized by Cournot competition among the firms. With segmented markets, intra-industry trade in the oligopolistic good across countries is expected. (Brander and Krugman, 1983) The inverse demand function for this good of country i is denoted by $P_i = A_i - Q_i$, where P_i is the price in country i and Q_i is the demand for the good. The parameter $A_i > 0$ is a measure of the size of the market and is assumed to be sufficiently large. The technology of each oligopolistic firm is characterized by a positive marginal cost c, which is independent of output level, and zero fixed cost. Denoting the export of the oligopolistic good by country i to country j by q_i^j, and the supply of firms in country i to its local market by q_i^i; in equilibrium $Q_j = \Sigma_i n_i q_i^j$. Initially all countries impose a non-prohibitive specific tariff rate of $t > 0$ on imported goods.

The profit of a representative oligopolistic firm in country i, π_i, is the sum of the profits from all markets, i.e., $\pi_i = \Sigma_j \pi_i^j$, where π_i^j is the profit from market j:

$$\pi_i^j = q_i^j \left[A_j - Q_j - (c + t_i^j) \right], \tag{1}$$

where $t_i^j = 0$ if $i = j$ or $t_i^j = t$ if $i \neq j$. The firm chooses the outputs, q_i^j, to maximize its profit, taking the tariff rate and the outputs of all other firms

as given. The first-order conditions (assuming an interior solution) are:

$$\begin{aligned} A_x - q_i^x - Q_x - c - t_i^x &= 0 \quad (2a) \\ A_y - q_i^y - Q_y - c - t_i^y &= 0 \quad (2b) \\ A_z - q_i^z - Q_z - c - t_i^z &= 0. \quad (2c) \end{aligned}$$

Solving the first-order conditions (2) for all the firms, we get the Nash equilibrium supply by a firm in country i to country j:

$$q_i^j = \frac{A_i - c - t_i^j(1+n)}{3n+1}. \quad (3)$$

Let $A_i^j = c + t_i^j(1+n)$. To have a positive output by a firm in country i exported to country j, it is assumed that $A_i > A_i^j$. This condition is satisfied if the market size of each country is sufficiently large and the tariff rate sufficiently small. From (1) and (3), we can get the profit received by a firm in country i from the market in country j as:

$$\pi_i^j = \left[q_i^j\right]^2, \quad (4)$$

which implies that the total profit received by a firm in country i is equal to:

$$\pi_i = \Sigma_j \pi_i^j = \Sigma_j [q_i^j]^2. \quad (5)$$

Following Krishna (1998), we assume that the profit of a representative local firm is the only criterion a government takes into consideration when deciding whether an FTA is to be set up.

3 Paths to GFT

We assume that global free trade (GFT, free trade by all countries) is the ultimate goal in terms of the welfare of the world. To reach this equilibrium with free trade by all countries, two possible paths to this point can be identified: (a) through multilateral negotiation and commitment; and (b) through a series of bilateral trade negotiation and trade liberalization. We call the first path the WTO path and the second path the FTA path. The conditions for these two paths are examined in detail below.

To simplify our notation, we add a subscript "ij" before a variable to represent the variable's value or function in the presence of an FTA between

countries i and j. For example, ${}_{xy}$FTA means an FTA between countries x and y, and ${}_{xy}q_x^z$ is the export of a firm in country x to country z in the presence of an FTA between countries x and y. Similarly, a subscript "xyz" refers to a variable in the presence of the GFT.

Furthermore, to get more insight into the roles of FTAs as building or stumping blocks, we focus on the case in which countries x and y have identical market sizes, i.e., $A_x = A_y = A_h$. Since countries x and y are identical, the subscript "h" represents a condition that applies to both of these two countries.

3.1 The WTO Path

The WTO path (named after the World Trade Organization) is the one along which all countries simultaneously choose to allow free trade with other countries. Feasibility of the WTO path requires both of the following conditions:

$$
\begin{aligned}
{}_{xyz}\pi^h - \pi^h &> 0 && \text{(6a)}\\
{}_{xyz}\pi^z - \pi^z &> 0. && \text{(6b)}
\end{aligned}
$$

Condition (6a) (condition (6b)) means that countries x and y (z) gain from GFT. If each of these conditions is satisfied with an equality, the country concerned will be indifferent. Thus we assume that the WTO path is feasible if at least one of the conditions (6) is satisfied with the other one being satisfied with the inequality indicated or with an equality.

Making use of the profit condition (5) and rearranging the terms, conditions (6) reduce to

$$
\begin{aligned}
A_z &> \left(\frac{n-1}{n+1}\right) A_h + \frac{2c}{n+1} + \frac{(3n^2+2n+1)t}{(n+1)} && (G^h)\\
A_z &< \left(\frac{n+1}{n}\right) A_h - \left(\frac{1}{n}\right) c - \frac{(3n^2+2n+1)t}{2n}. && (G^z)
\end{aligned}
$$

Both conditions can be illustrated graphically. In Figure 1, line G^h (G^z) shows the combinations of A_h and A_z that satisfy condition G^h (G^z), with the inequaltiy sign replaced by an equality sign. Lines G^h and G^z are positively sloped (when $n > 1$), cutting the 45° line at point Q, with the corresponding market size given by $A_h^q = c + (3n^2 + 2n + 1)t/2$. If $n = 1$, line G^h is a

horizontal line. Note that in order for the firms to have positive outputs, (3) requires that $A_h > A_h^t = c + (n+1)t$.

Condition (G^h) is satisfied at any point above line G^h while condition (G^z) holds for points below line G^z. Figure 1 shows that above point Q, countries x and y benefit from an FTA (the GFT) with country z if the latter is bigger, and similarly country z likes to have the GFT if countries x and y are both bigger. The implication is that if all countries are of the same size, they prefer the GFT if $A_h = A_z > A_h^q$.

Let the set of points satisfying condition (G^h) be denoted by $\mathcal{G}^h$, and those satisfying (G^z) by $\mathcal{G}^z$. In Figure 1, set $\mathcal{G}^h$ $(\mathcal{G}^z)$ is the areas a, b, and c (b, c, and d). Let us define set $\mathcal{W}$ as $\mathcal{G}^h \cap \mathcal{G}^z$ (areas b and c in Figure 1), plus the portions of lines G^h and G^z with $A_h > A_h^q$, as the values of (A_h, A_z) with which the WTO path is feasible. It is clear from the diagram that the size of set $\mathcal{W}$ is defined by three things: point Q, which in turn is defined by the value of A_h^q, the slope of line G^h (denoted by s^h), and the slope of line G^z (denoted by s^z). These three things are affected by n, c, and t in the following ways:

- A_h^q: All elements in $\mathcal{W}$ have a value of A_h not less than A_h^q. From the expression given above, A_h^q increases with c, n, t.

- s^h, the slope of line G^h: From condition (G^h), $s^h = (n-1)/(n+1) = 1 - 2/(n+1)$. The minimum value of s^h is 0, i.e., line G^h is a horizontal line, when $n = 1$. If n goes up, s^h increases as well, meaning that line G^h is getting closer to the 45° line. Line G^h asymptotically becomes the 45° line when n approaches infinity.

- s^z, the slope of line G^z: From condition (G^z), $s^z = (n+1)/n = 1 + 1/n$. If there is only one firm in each economy, s^z is at its maximum value of 2. The value of s^z then decreases when n increases, and approaches unity as n approaches infinity.

Condition G^h suggests that as long as $A_h > A_h^q$, countries x and y are willing to form an FTA with a third country at least as big (or sligthly smaller). Similarly, by condition G^z, if $A_h > A_h^q$, country z is willing to form an FTA with countries x and y at least as big (or slightly smaller). Note that if all countries are of the same size and $A_h = A_z > A_h^q$, all countries are willing to have GFT, but if $A_h^t < A_h = A_z < A_h^q$, they do not prefer GFT.

The above results are summarized by the following two lemmas:

Lemma 1: A necessary condition for the WTO path is that both A_h and A_z are greater than $c + (3n^2 + 2n + 1)t/2$.

Lemma 2: The WTO path is more likely to be feasible if (a) the countries have similar and sufficiently large market sizes; or (b) the countries have similar market sizes and if the initial tariff rates are sufficiently small. The WTO path will be less likely if there is an increase in n, c, or t.

An implication of the WTO path is that if the sizes of all countries are the same and greater than a certain value, then all firms in the countries will benefit from the GFT. The minimum size requirement reveals the fact that larger market sizes will enable the firms to capture bigger profits when trade is liberalized.

3.2 The FTA Path

Instead of having multilateral actions, the GFT may be reached through a series of bilateral trade liberation actions (free trade areas). This requires the formation of a new FTA consisting of a subset of existing countries, and then formation of more FTAs or expansion of the existing FTA, until all countries are included in one single big FTA.

In forming a new FTA, we assume that all countries are myopic in the sense that they care about what they can get after the FTA is formed, but would not consider whether the new FTA will induce more FTAs and how they themselves may be affected by possible future FTAs. This assumption tries to capture the observed fact that in many democractic societies, elected government leaders are more concerned about what they can bring to the socieites during the term of their office.

We now explain the features and conditions for this path, and the path depends on which FTA is formed first.

3.2.1 The XY Subpath

Suppose that countries x and y choose to form an FTA first. We now examine how and under what conditions the GFT can ultimately be reached. This requires several steps, in each of which a new FTA is formed.

(1) An FTA with countries x and y.

Conditions for such an FTA to be formed are:

$$_{xy}\pi^h - \pi^h > 0 \tag{7a}$$
$$_{xy}\pi^h - {}_{xz}\pi^h > 0. \tag{7b}$$

Condition (7a) means that for countries x and y the FTA is better than the status quo, and condition (7b) implies that x and y prefer an FTA between them to an FTA with z.[4] These two conditions reduce to:

$$A_h > c + \frac{(3n^2+2n+1)t}{2(n+1)} \tag{XY^h}$$
$$A_z < A_h. \tag{XY^z}$$

The superscripts of the condition labels refer to the country (h for both x and y) concerned. In Figure 2, these two conditions are illustrated by the shaded areas on the appropriate side of the lines labeled XY^h and XY^z, which are conditions (XY^h) and (XY^z), respectively, with the inequality signs replaced by an equality sign. Note that line XY^h is a vertical line while line XY^z coincides with the 45° line.

(2) Given the X-Y FTA, countries x and z choose to form a new FTA. This requires that countries x and z gain from the new FTA, as described respectively by

$$_{xz|xy}\pi^x - {}_{xy}\pi^x > 0 \tag{8a}$$
$$_{xz|xy}\pi^z - {}_{xy}\pi^z > 0, \tag{8b}$$

where "$xz|xy$" represents the situation in which the X-Z FTA is formed in

[4] If condition (7b) is satisfied with an equality, countries x and y are indifferent to an FTA between themselves and an FTA with z. This happens when all the countries are identical. In such a case, and if condition (7a) is also satisfied, the countries will allow GFT. For the present X-Y subpath, we assume that condition (7b) holds with an inequality.

the presence of the X-Y FTA.[5] These two conditions reduce to the followings:

$$A_z > \left(\frac{n}{2n+1}\right) A_h + \left(\frac{n+1}{2n+1}\right) c + \frac{(n+1)^2 t}{2(2n+1)} \qquad (XZ^x|XY)$$

$$A_z < \left(\frac{2n+1}{n}\right) A_h - \left(\frac{n+1}{n}\right) c - \frac{(n^2+4n+1)t}{2n}. \qquad (XZ^z|XY)$$

In Figure 2, these two conditions are shown by the areas on the appropriate side of the lines labeled $XZ^x|XY$ and $XZ^z|XY$. Line $XZ^x|XY$ is less steeper, while line $XZ^z|XY$ is steeper, than the 45° line. Lines $XZ^x|XY$ and $XZ^z|XY$ cut the 45° line at points S and K, with the value of A_h given by $A_h^s = c + (n+1)t/2$ and $A_h^k = c + (n^2+4n+1)t/[2(n+1)]$. Note that $A_h^s < A_h^k$.

(3) Countries y and z choose to form an FTA in the presence of the X-Y and X-Z FTAs

This step requires the following conditions

$$_{yz|xy,xz}\pi^y - _{xy,xz}\pi^y > 0 \qquad (9a)$$

$$_{yz|xy,xz}\pi^z - _{xy,xz}\pi^z > 0, \qquad (9b)$$

where "$|_{xy,xz}$" means in the presence of the X-Y and X-Z FTAs.[6] Conditions (9) reduce to the following two conditions:

$$A_z > \left(\frac{n}{2n+1}\right) A_h + \left(\frac{n+1}{2n+1}\right) c + \frac{(5n^2+4n+1)t}{2(2n+1)} \qquad (YZ^y|XY,XZ)$$

$$A_z < \left(\frac{2n+1}{n}\right) A_h - \left(\frac{n+1}{n}\right) c - \frac{(5n^2+4n+1)t}{2n}. \qquad (YZ^z|XY,XZ)$$

[5] The X-Z FTA will still be formed if only one of the two conditions is satisfied while the other one holds with an equality. It turns that these two conditions are implied by other conditions in the XY subpath.

[6] The Y-Z FTA will be formed if one of the two conditions is satisfied while the other one holds with an equality.

In Figure 2, the two conditions are illustrated by the areas on the appropriate side of the lines labeled $YZ^y|XY, XZ$ and $YZ^z|XY, XZ$, with the former less steep, and the latter steeper, than the 45° line. Both lines cut the 45° line at the same point, P, with the corresponding value of A_h equal to $A_h^p = c + (5n^2 + 4n + 1)t/[2(2n + 1)]$.

The FTA path through the formation of an X-Y FTA first is said to be feasible if conditions XY^h, XY^z, $XZ^x|XY$, $XZ^z|XY$, $YZ^y|XY, XZ$, and $YZ^z|XY, XZ$ are all satisfied. If either of these conditions is violated, the FTA path is not feasible. Let us denote the set $\{A_h, A_z\}$ that satisfies the above conditions and yields a feasible XY subpath by $\mathcal{H}$.

The above analysis identifies six conditions for the XY subpath, but some of them are redundant.

Lemma 3: The XY subpath is described by conditions (XY^z) and $(YZ^y|XY, XZ)$, the latter being with an equality except when $A_h = A_h^p$.

The proof of Lemma 3 is given in the appendix. What this lemma implies is that set $\mathcal{H}$ is defined by conditions (XY^z) and $(YZ^y|XY, XZ)$ only. This situation and the lemma can be illustrated in Figure 2. The six conditions derived above are illustrated by the relevant lines and the partially shaded areas. The diagram shows the following relations between the conditions: (a) Condition $(YZ^z|XY, XZ)$ implies condition $(XZ^z|XY)$; (b) Condition $(YZ^y|XY, XZ)$ implies condition $(XZ^x|XY)$; (c) Conditions $(YZ^z|XY, XZ)$ and $(YZ^y|XY, XZ)$ imply condition (XY^h); (d) Conditions (XY^z) and $(YZ^y|XY, XZ)$ imply condition $(YZ^z|XY, XZ)$. It is clear from the diagram or Lemma 3 that set $\mathcal{H}$ is represented by the area bounded by line XY^z and $YZ^y|XY, XZ$, plus the part of line $YZ^y|XY, XZ$ beyond point P.[7]

Since set $\mathcal{H}$ is defined by conditions (XY^z) and $(YZ^y|XY, XZ)$ only, it is straightforward to find out how this set is affected by some exogenous variables. First, note that point P is given by

$$A_h^p = A_z^p = c + \frac{5n^2 + 4n + 1}{2(n + 1)}t. \tag{10}$$

By (10), A_h^p increases with c, t, and n. On the other hand, the slope of line

[7] Solid thick line means that the corresponding condition can be satisfied with an equality. Dotted thick line means that the corresponding condition has to be satisfied with an inequality.

$YZ^y|XY, XZ$ is equal to

$$s^p = \frac{n}{2n+1}. \tag{11}$$

From (11), the smallest value of s^p is 1/3 when $n = 1$. By using the analysis presented earlier, line $YZ^y|XY, XZ$ is less steep than line G^h if $n > 2$. The slope s^p is independent of c and t, but increases with n, and when n approaches infinity, line $YZ^y|XY, XZ$ approaches to 1/2. Thus we have

Lemma 4: Set $\mathcal{H}$ shrinks with an increase in c, t, or n: Point P moves up the 45° line when c, t, or n increases, and line $YZ^y|XY, XZ$ gets steeper and approaches 1/2. The XY subpath is not feasible if (i) $A_h < A_h^p$; or (ii) $A_z > A_h$.

Condition (i) in the above lemma is not surprising because we have already pointed out that a beneficial GFT requires that the market sizes of the countries be not too small. Condition (ii) is necessary because if country z is too big, countries x and y may prefer to form an FTA with z in the first place.

3.2.2 The XZ Subpath

Along this subpath, first an FTA is formed between countries x and z. More FTAs are formed until all countries permit free trade. Again, to reach GFT, several steps would have to be taken.

(1) An X-Z FTA.

This step requires the following three conditions:

$$_{xz}\pi^x - \pi^x > 0 \tag{12a}$$

$$_{xz}\pi^z - \pi^z > 0 \tag{12b}$$

$$_{xy}\pi^x - {}_{xz}\pi^x < 0. \tag{12c}$$

Condition (12a) means that country x gains from an FTA with z while condition (12b) means that country z agrees.[8] Condition (12c) implies that country x gains more from the X-Z FTA than from an FTA with y. These

[8]Note that to have the X-Z FTA formed, either condition (12a) or condition (12b) (not both) can be replaced with an equality.

three conditions reduce to

$$A_z > \left(\frac{n}{2n+1}\right) A_h + \left(\frac{n+1}{2n+1}\right) c + \frac{(3n^2+2n+1)t}{2(2n+1)} \qquad (XZ^x)$$

$$A_z < \left(\frac{2n+1}{n}\right) A_h - \left(\frac{n+1}{n}\right) c - \frac{(3n^2+2n+1)t}{2n} \qquad (XZ^z)$$

$$A_z > A_q. \qquad (XZ^{xx})$$

All these conditions can be illustrated by the shaded areas on the appropriate side of the lines labeled XZ^x, XZ^z, and XZ^{xx}. Note that XZ^{xx} coincides with the 45° line, while XZ^x is less steep, and XZ^z steeper, than the 45° line. These three lines intercept at the same point, B, with the value of A_h given by $A_h^b = c + (3n^2+2n+1)/[2(n+1)]$.

(2) A Y-Z FTA in the presence of the X-Z FTA

In the presence of the X-Z FTA, countries y and z will choose to form a new FTA if the following conditions are satisfied:

$$_{yz|xz}\pi^y - {}_{xz}\pi^y > 0 \qquad (13a)$$

$$_{yz|xz}\pi^z - {}_{xz}\pi^z > 0. \qquad (13b)$$

Conditions (13a) and (13b) mean that both y and z gain from such an FTA.[9] These two conditions reduce to

$$A_z > \left(\frac{n}{2n+1}\right) A_q + \left(\frac{n+1}{2n+1}\right) c + \frac{(7n^2+4n+1)t}{2(2n+1)} \qquad (YZ^y|XZ)$$

$$A_z < \left(\frac{2n+1}{n}\right) A_q - \left(\frac{n+1}{n}\right) c - \frac{(n+1)^2 t}{2n}. \qquad (YZ^z|XZ)$$

In Figure 3, these two conditions are illustrated by the shaded areas on the appropriate side of the lines labeled $YZ^y|XZ$ and $YZ^z|XZ$, respectively. Line $YZ^y|XZ$ is less steep than the 45° line but cuts the latter at point U, with the corresponding value of A_h given by $A_h^u = c+(7n^2+4n+1)t/[2(n+1)]$. Line $YZ^z|XZ$, on the other hand, is steeper than the 45° line and cuts the latter at $A_h^m = c + (n+1)t/2$.

[9] The Y-Z FTA will still be formed if either condition (13a) or condition (13b) holds with inequality while the other one holds with equality.

(3) An X-Y FTA in the presence of the X-Z and Y-Z FTAs

Countries x and y must gain from such an FTA, requiring the following condition:

$$_{xy|xz,yz}\pi^h - _{xz,yz}\pi^h > 0,$$

which reduces to

$$A_h > c + \frac{(5n^2+4n+1)t}{2(n+1)}. \qquad (XY^h|XZ,YZ)$$

Note that condition $XY^h|XZ,YZ$ applies to countries x and y. In Figure 3, it is represented by the shaded area on the right-hand side of the vertical line labeled $XY^h|XZ,YZ$, which cuts the 45° line at point F, with $A_h^f = c + (5n^2+4n+1)t/[2(n+1)]$.

The FTA path through an X-Z FTA first is said to be feasible if conditions XZ^x, XZ^z, XZ^{xx}, $YZ^y|XZ$, $YZ^z|XZ$, and $(XY^h|XZ,YZ)$ are satisfied. Let us denote the set of the values of (A_h, A_z) that satisfy these six conditions by $\mathcal{Z}$. It turns out that, as proved in the appendix, two of the conditions are redundant and set $\mathcal{Z}$ is defined by four conditions only:

Lemma 5: The XZ path to GFT is feasible if conditions XZ^z, XZ^{xx}, $YZ^y|XZ$, and $(XY^h|XZ,YZ)$ are satisfied.

The set $\mathcal{Z}$ in which the XZ subpath is feasible is shown by the shaded region in Figure 3, where all the conditions are shown. It can be shown that condition $(YZ^y|XZ)$ implies condition (XZ^x) while condition (XZ^z) implies condition $(YZ^z|XZ)$. Thus set $\mathcal{Z}$ is defined by the remaining four conditions, as Lemma 5 shows. Note that the set

4 Regionalism as a Building Block to GFT

We now analyze the relationship between multilateralism and regionalism.

Definition 1: Regionalism is said to be a building block to GFT if the following conditions hold: (B1) the WTO path is not chosen by at least one country, and (B2) through a series of FTAs all countries ultimately reach GFT.

These two conditions mean that while the WTO path does not lead to GFT, some countries prefer to have an FTA, and the FTA expands or more FTAs are formed so that eventually the GFT is reached.

Let us examine condition (B1) more closely. If countries x and y refuse to allow GFT in a multilateral setting, condition (G^h) does not hold. Alternatively, country z refuses to allow multilateral trade liberalization if condition (G^z) is violated. In terms of Figure 1 or Figure 4, the set of (A_h, A_z) that lead to countries x and y's rejection of multilateralism is the complement of set $\mathcal{G}^h$, denoted by set $\tilde{\mathcal{G}}^h$ and is graphically given by the area below line G^h. Similarly, the set of (A_h, A_z) that lead to country z's rejection of multilateralism is given by the area above line G^z, i.e., the set $\tilde{\mathcal{G}}^z$.

We now turn to condition (B2). As explained earlier, regionalism can exist through either the XY subpath or XZ subpath.

4.1 The XY Subpath

The conditions for feasibility of the XY subpath are analyzed earlier. Recall that in Figure 2, the shaded region represents the set $\mathcal{H}$, which contains values of A^h and A^z that support the XY subpath. By definition 1, regionalism is a building block to GFT if (A_h, A_z) is in the set $\tilde{\mathcal{G}}^h \cap \mathcal{H}$ or $\tilde{\mathcal{G}}^z \cap \mathcal{H}$ or both.

In Figure 4, with $n > 2$, the region below line G^h represents set $\tilde{\mathcal{G}}^h$. When set $\mathcal{H}$ (the area above point P bounded by lines XZ^{xx} and $YZ^y|XY, XZ$) is added to the diagram, we get set $\tilde{\mathcal{G}}^h \cap \mathcal{H}$, or the shaded areas a and b. Any value (A_h, A_z) in this set implies that multilateral trade liberalization is not successful (because countries x and y reject it), but GFT can be obtained through the XY subpath. In terms of the present terminology, FTA is a building block to GFT.

If, however, (A_h, A_z) is the region left of line G^z (set $\tilde{\mathcal{G}}^z$), then it is country z that rejects multilateralism. The XY subpath can still lead to GFT if (A_h, A_z) is in set $\mathcal{H}$. In Figure 4, we require that (A_h, A_z) be in region b.

As a summary, we can say that in regions a and b, regionalism is a building block to GFT: in region a, countries x and y rejects multilateralism but country z supports it, and in region b, all three countries rejects multilateralism.

Figure 4 shows the case in which $n > 1$ so that line G^h is positively sloped. If, however, $n = 1$, G^h becomes a horizontal line. Furthermore, lines G^h and $YZ^y|XZ$ will cut each other at a point on the 45° line. This case is shown in Figure 5. Areas a and b become much smaller than the corresponding areas in the case when $n > 2$.

To see how the present results can be applied, let us suppose that we

have two similar developed countries and a smaller developing country. If multilateral trade negotiation fails to produce GFT, our results show that allowing countries to form FTAs may achieve GFT eventually (area a or b, through the XY subpath). If that happens, regionalism is a building block for GFT.

The results are summarized in the following lemma:

Lemma 6: Refer to Figure 4 or 5. If (A_h, A_z) is in region a, countries x and y reject multilateralism but through the XY subpath, GFT is achieved ultimately. If (A_h, A_z) is in region b, then all countries refuse to allow simultaneous trade liberalization, while regionalism through the XY path is a building block to GFT.

4.2 The XZ Subpath

We now explain another way of achieving GFT through regionalism. Recall that in Figure 3, in the shaded region (set $\mathcal{Z}$) the XZ subpath can lead to GFT. If (A_h, A_z) is given by a point in $\tilde{\mathcal{G}}^h$ (or $\tilde{\mathcal{G}}^z$), then countries x and y (or country z) will reject multilateralism. We can thus show in Figures 4 and 5 areas c and d in which regionalism through the XZ subpath is a building block to GFT. There is a difference between areas c and d: When given area d, country z rejects multilateral trade liberalization while countries x and y support, but when given area c, all countries reject multilateralism.

As explained, Figure 4 shows the cases in which $n > 2$, but Figure 5 shows the cases in which $n = 1$. In Figure 5, line G^h is a horizontal line. We now have:

Lemma 7: Refer to Figure 4 or 5. If (A_h, A_z) is in region d, country z rejects multilateralism but through the XZ subpath, GFT is achieved ultimately. If (A_h, A_z) is in region c, then all countries would refuse multilateral trade liberalization, while regionalism through the XZ path is a building block to GFT.

5 Regionalism as a Stumbling Block for GFT

We now consider the stumbling block cases. We first have the following definition:

Definition 2: Regionalism is said to be a stumbling block to GFT if the following conditions hold: (S1) the WTO path can lead the countries to GFT, (S2) a subset of the countries prefer forming an FTA to GFT, and (S3) the process of FTA formation stops before GFT is reached.

Condition (S1) requires that all countries benefit from the GFT. So if the WTO path is the only option for the countries, they will agree to establish GFT. However, if FTA is another option, it is possible that some of the countries prefer an FTA among themselves to GFT. Once the first FTA is established, the question is whether more FTAs will be formed so that eventually GFT is reached. If the answer to the last question is negative, then regionalism is said to be a stumbling block to GFT.

Condition (S1) implies that conditions G^h and G^z are satisfied. In terms of Figure 1, it requires that (A_h, A_z) should be in the set $\mathcal{G}^h \cap \mathcal{G}^z$.

For condition (S2), two cases can be pointed out. First, it may be countries x and y that prefer an FTA to GFT, or countries x (or y) and z that prefer an FTA to GFT. These two cases are analyzed separately.

5.1 The XY Subpath

First we require that countries x and y prefer to form an FTA than to the GFT, i.e.,

$$_{xy}\pi^h - {}_{xyz}\pi^h > 0,$$

which reduces to

$$A_z < \frac{2n}{n+1}A_h - \left(\frac{n+3}{n+1}\right)c - \frac{(3n^2+2n+1)t}{2(n+1)}. \qquad (XY/G^h)$$

Condition XY/G^h states that countries x and y prefer to form an FTA to GTA. In the special case in which $n = 1$, the condition reduces to

$$A_z < A_h - 2c - 3t/2. \qquad (XY/G^{h\prime})$$

Condition $XY/G^{h\prime}$ is illustrated in Figure 6 by line $XY/G^{h\prime}$, which was formed by replacing the inequality sign in the above condition by an equality. The line has a slope equal to unity with a negative vertical intercetp, cutting horizontal line G^h at point A, at which the value of A_h equals to $A_h^a = 3c + 9t/2$. In addition to this condition, conditions XY^h and XY^z have to be satisfied as well, so that x and y can benefit from the FTA and both prefer

not to have an FTA with z instead. Figure 2 shows that conditions G^h and G^z imply XY^z, and Figure 6 shows that $XY/G^{h\prime}$ implies XY^h.

Suppose now that after forming the X-Y FTA, neither x or y is willing to form a new FTA with z. This means that either condition $XZ^x|XY$ or condition $XZ^z|XY$ is violated (or both). However, it is clear from Figures 1 and 2 that if (A_h, A_z) satisfies conditions G^h, G^z, and XY^z, then condition $XZ^z|XY$ is also satisfied. In terms of condition $XZ^x|XY$, note that (in Figure 1) line G^h cuts the 45° line at point Q, which is higher than the intersecting point between line $XZ^x|XY$ and the 45° line, point S. Furthermore, the slope of line $XZ^x|XY$ is $s^p = n/(2n+1)$. On the other hand, the slope of line G^h is $s^s = (n-1)/(n+1)$. Thus we have

$$s^p - s^s = \frac{n}{2n+1} - \frac{n-1}{n+1}. \tag{14}$$

It is clear from (14) that $s^p - s^s > 0$ if and only if $n < 3$. If $n \geq 3$, line G^h is steeper than line $XZ^x|XY$ and from Figures 1 and 2, there does not exist a value of (A_h, A_z) so that countries x and y reject multilateralism, prefer an FTA between them, and ultimately lead to GFT. If $n = 1$ or 2, $s^p > s^s$, and there are some values of (A_h, A_z) with which country x, when having an FTA with y, does not prefer to have another FTA with country z. For the case $n = 1$, the set is illustrated by the shaded area labeled m in Figure 6, and is defined by line G^h and $XZ^x|XY$, which cut each other at point C, with the corresponding value of A_h equal to $A_h^c = c + 7t$.[10]

There is another possibility for the XY subpath not to lead to GFT. Now let countries x and y choose to establish an FTA, and then let countries x and z form another one. Will countries y and z set up a third one? If they do, then the GFT is achieved, and that requires that conditions $YZ^y|XY, XZ$ and $YZ^z|XY, XZ$ be satisfied. It is clear from Figures 2 and 6 that if XY^z and G^h are both satisfied, condition $YZ^z|XY, XZ$ follows. Line $YZ^y|XY, XZ$, which is formed from condition $YZ^y|XY, XZ$ with the inequality sign replaced by an equality, cuts the G^h line at point D, where $A_h^d = c + 4t < A_h^a$. In Figure 6, area k represents the values of (A_h, A_z) that satisfy the followings: (a) All countries find GFT beneficial. (b) Countries x and y prefer to form an FTA instead of the GFT. (c) Countries x and z then choose to form the second FTA. (d) Country y refuses to form a separate FTA with country z. As a

[10]Note that A_h^a and A_h^c cannot be ranked with each other. Figure 6 shows the case in which $A_h^a < A_h^c$.

result, GFT is not achieved. This is another example of regionalism as a stumbling block. Thus we have:

Lemma 8: The values of (A_h, A_z) that lead to the XY subpath being a stumbling block are defined by area bounded by line G^h and $YZ^y|XY, XZ$. This is areas m plus k. Area m represents the values of (A_h, A_z) with which country x refuses to form the second FTA with country z, while area k includes those values of (A_h, A_z) that cause country y to reject a third FTA with country z.

5.2 The XZ Subpath

We now turn to the XZ subpath. We have the following lemma:

Lemma 9: If GFT is feasible under multilateral trade negotiation, and if countries x and z choose to form an FTA instead, GFT can also be achieved ultimately.

Let us first explain what this lemma implies before we explain why. It means that if GFT is beneficial to all countries, then regionalism will not be a stumbling block if countries x and z choose to form an FTA, because the FTA will eventually expands so that country y will be included, and that is GFT.

To see why this lemma exists, let us begin with the following conditions:

1. Conditions G^h and G^z are satisfied so that all countries benefit from GFT.

2. Conditions XZ^x, XZ^y, XZ^{xx} are all satisfied so that countries x and z choose to set up an FTA instead of having multilateral trade liberalization.

Condition (1) means that the GFT benefits all countries, while condition (2) implies that countries x and z choose to form an FTA. It turns out that the set of (A_h, A_z) that satisfy these five conditions is a subset of $\mathcal{Z}$, the feasible set of the XZ subpath. In other words, there does not exist a pair (A_h, A_z) so that regionalism is a stumbling block through an FTA between x and z. This situation is illustrated in Figure 7, which is a reproduction of Figure 3, with the line G^z added.[11]

[11] Note that line G^h is not relevant because conditions G^z and XZ^{xx} require that the value of (A_h, A_z) should be bounded by these two conditions and be higher than point Q.

6 Concluding Remarks

For some time, multilateral trade liberalization seemed to be a promising way of achieving GFT, and the success of the Kennedy round and the Tokyo round under the GATT was especially encouraging. However, later multilateral trade negotiations got more difficult, and the current Doha round does not seem to be going as expected. The rise of countries' interest in regional cooperation in recent years was disturbing because it is worried that regional integration negotiations could drain resources away from those for multilateral negotiations, making multilateral trade liberalization even more unlikely.

This paper takes up the question posed by Bhagwati (1991): Is regionalism a building block or a stumbling block toward global free trade. We first examine the implications of this question and carefully explain the two possible paths for countries to achieve GFT: the WTO path that relies on multilateralism and the FTA path that relies on regionalism. We argue that if both paths are feasible, countries have the option of choosing the path and eventually GFT will be reached.[12] If both paths are not feasible, then GFT cannot be achieved on a voluntary basis. The question of building block or stumbling block is meaningful if one of the paths is feasible but the other one is not. If the WTO path is not feasible but the FTA path is, then the latter can lead countries to GFT. This is the building block case. Alternatively, if the WTO path is feasible but the FTA path is not, and if some countries prefer regional integration, then GFT will not be achieved. This is the stumbling block case.

[12] To rank these two paths, when both of them are feasible, is another issue.

Appendix

Proof of Lemma 3: We first note that condition XY^z is presented by the space below the 45° line. Refer to Figure 2. Line $XZ^y|XY, XZ$ comes from condition $XZ^y|XY, XZ$, with the inequality replaced by an equality. The condition is represented by the space above line $XZ^y|XY, XZ$. This line cuts the 45° line at point P, with the corresponding value of A_h given by $A_h^q = c + (5n^2 + 4n + 1)t/[2(n + 1)]$. The set $\mathcal{H}$, $\{A_h, A_z\}$, that satisfies conditions XY^z and $XZ^y|XY, XZ$ is represented by the shaded area in Figure 3. We now want to argue that set H satisfies all other conditions for the XY path.

First, we look at condition XY^h, which is given by the space right of the vertical line XY^h, where the line comes from the corresponding condition with the inequality replaced by an equality. The line cuts the 45° line at point Y, with the value of A_h equal to $A_h^y = c + (3n^2 + 2n + 1)t/[2(n + 1)]$. Thus set $\mathcal{H}$ satisfies condition XY^h.

Next, we consider condition [13]. Replace the inequality by an equality in the condition to construct line $XZ^z|XY, XZ$ as shown in Figure 2. This line has a slope greater than unity, and cuts the 45° line at point P. As a result, set $\mathcal{H}$ satisfies condition $XZ^z|XY, XZ$.

We now turn to condition $XZ^z|XY$. Replace the inequality in the condition by an equality to get line $XZ^z|XY$ in Figure 2. The condition shows that it has a slope greater than unity, cutting the 45° line at point K, with a corresponding value of $A_h^k = c + (n^2 + 4n + 1)t/[2(n + 1)]$. This means that set $\mathcal{H}$ satisfies condition $XZ^z|XY$.

Lastly, we turn to condition $XZ^x|XY$. Again, construct line $XZ^x|XY$ by replacing the inequality in the condition with an equality. This line is parallel to line $XZ^y|XY, XZ$, and has a slope less than unity. It cuts the 45° line at point S, with a corresponding value of A_h equal to $A_h^s = c + (n^2 + 4n + 1)t/[2(n + 1)]$. Comparing this value with the values of other points on the 45° line, we have $A_h^p > A_h^y > A_h^k > A_h^s > 0$. Thus set $\mathcal{H}$ satisfies condition $XZ^y|XY$.

As a result, set $\mathcal{H}$, which is defined by XY^z and $XZ^y|XY, XZ$, satisfies all other conditions. ■

Proof of Lemma 5: The above analysis shows that the line formed from condition XZ^x and that from $YZ^y|XZ$ (by replacing the inequality with an equality) are parallel, with the former cutting the 45° line at point B

[13] In fact, line $XZ^z|XY, XZ$ and line $XZ^z|XY$ are parallel.

and the latter at point U. As explained earlier, at point B, $A_h^b = c + (3n^2 + 2n + 1)/[2(n+1)]$ and at point U, $A_h^u = c + (7n^2 + 4n + 1)t/[2(n+1)]$. As a result, line XZ^x is below line $YZ^y|XZ$, which means that condition $YZ^y|XZ$ implies condition XZ^x.

Along the same line of argument, the previous analysis shows that the line formed from condition XZ^z and the line formed from condition $YZ^z|XZ$ are parallel, with the former farther away from the origin. This means that condition XZ^z implies condition $YZ^z|XZ$. Combining these two results mean that the XZ subpath is defined by four conditions only: XZ^z, XZ^{xx}, $YZ^y|XZ$, and $XY^h|XZ, YZ$. ■

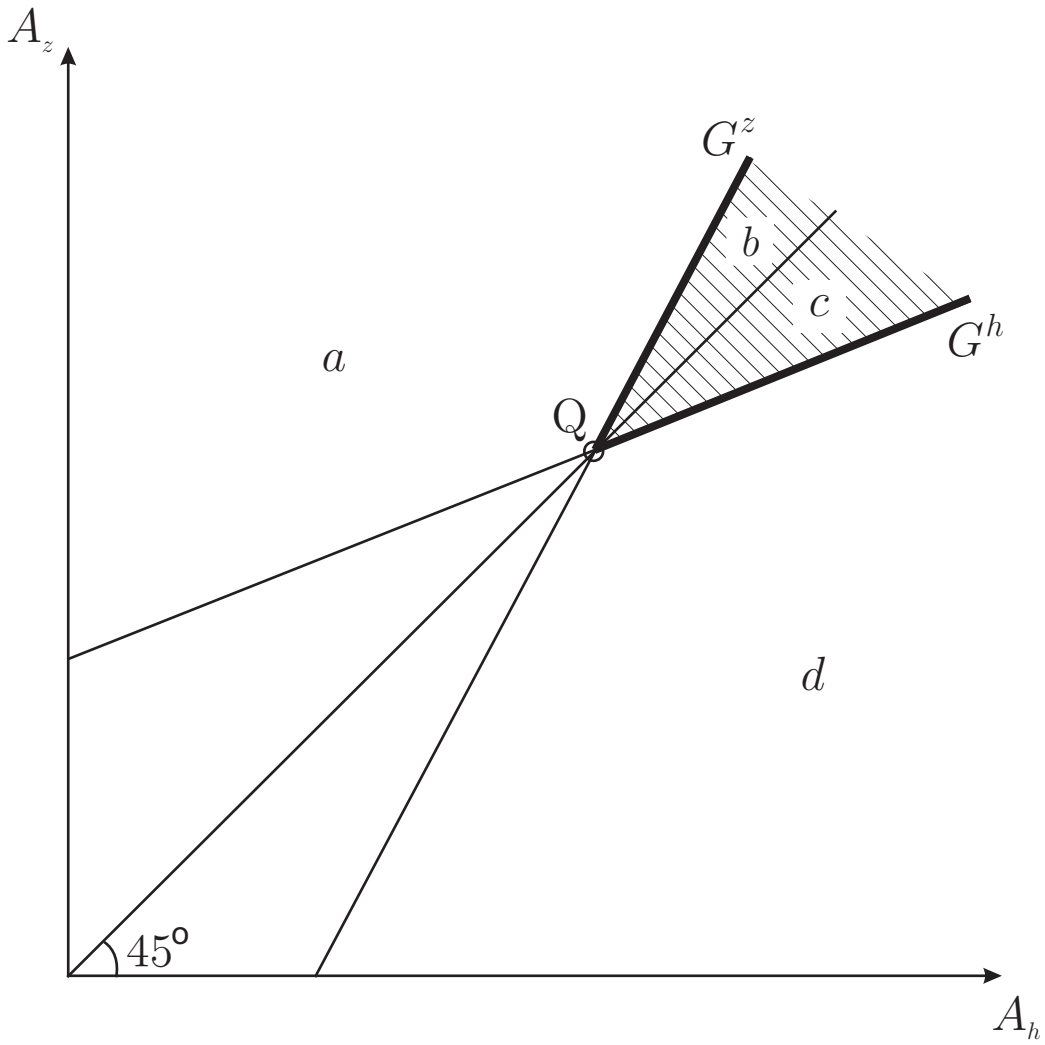

Figure 1 The WTO Path

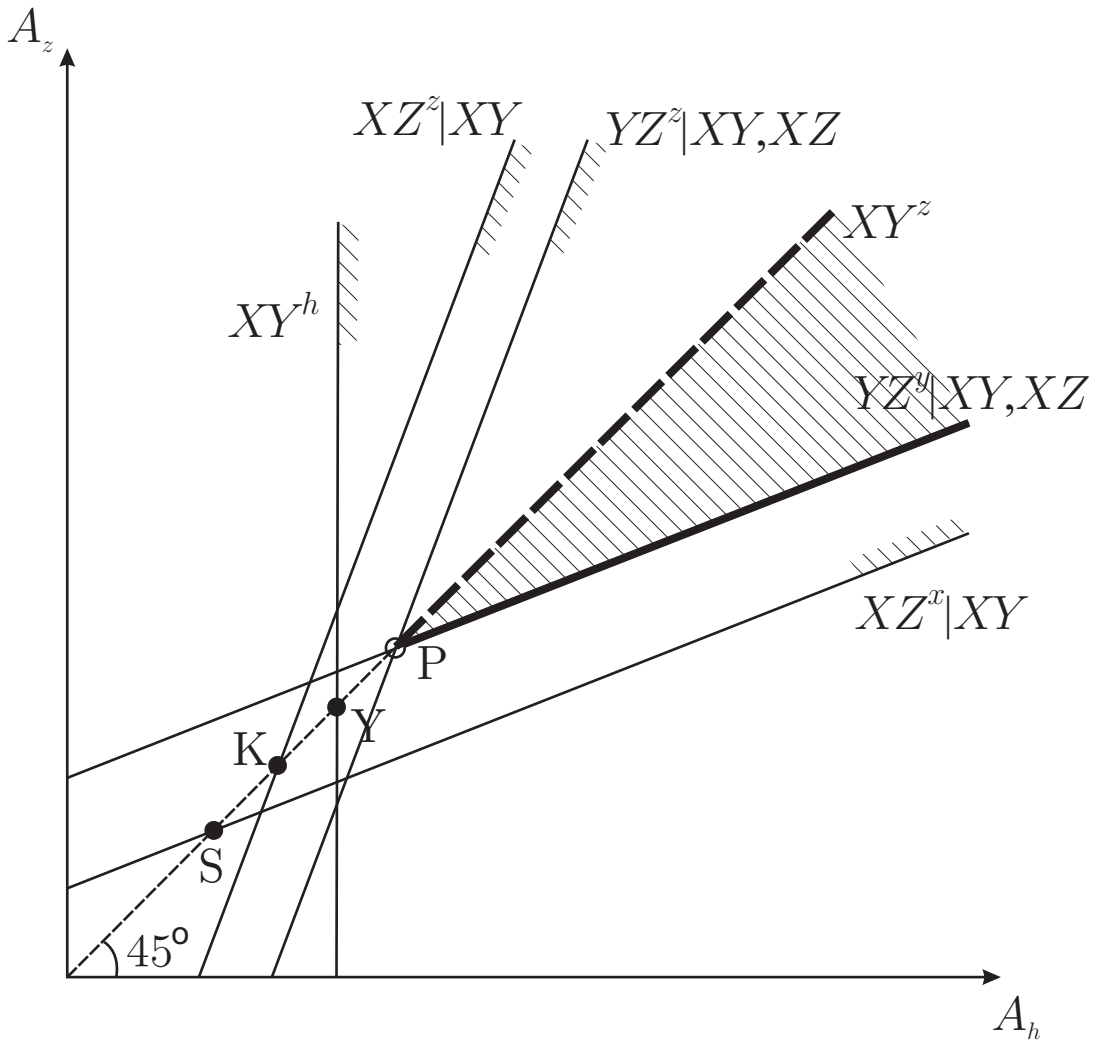

Figure 2 The XY Subpath

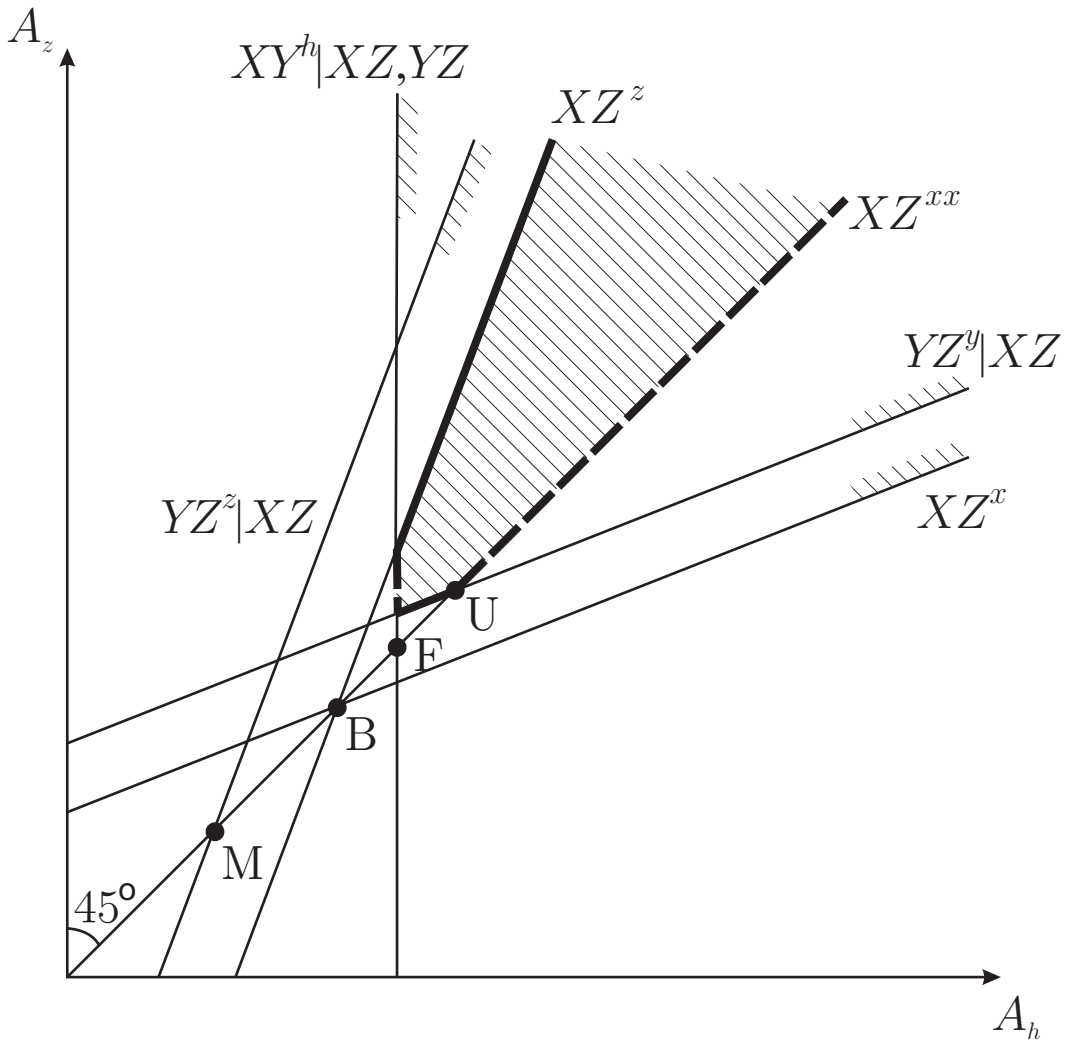

Figure 3 The XZ Subpath

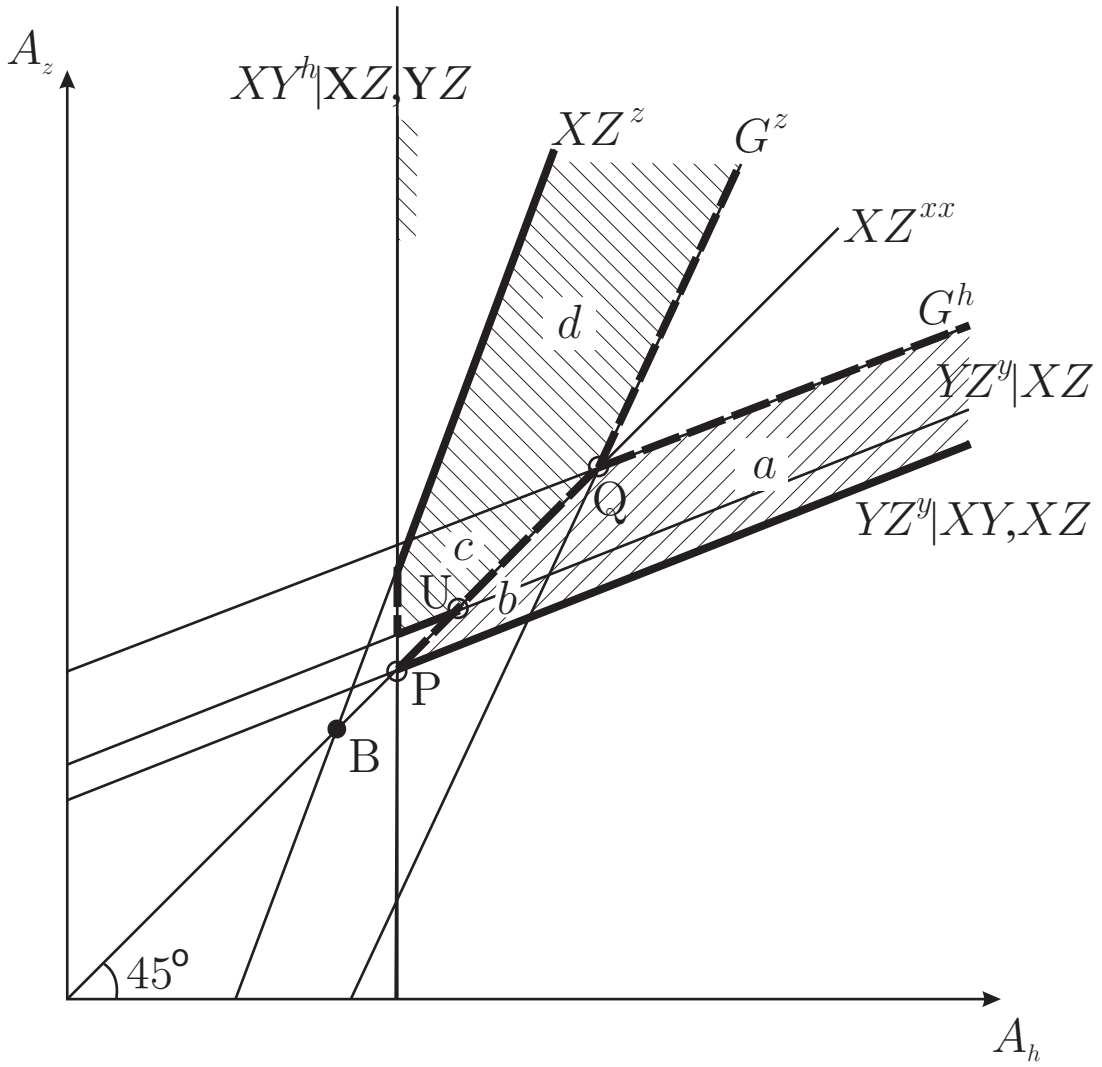

Figure 4 Regionalism as A Building Block

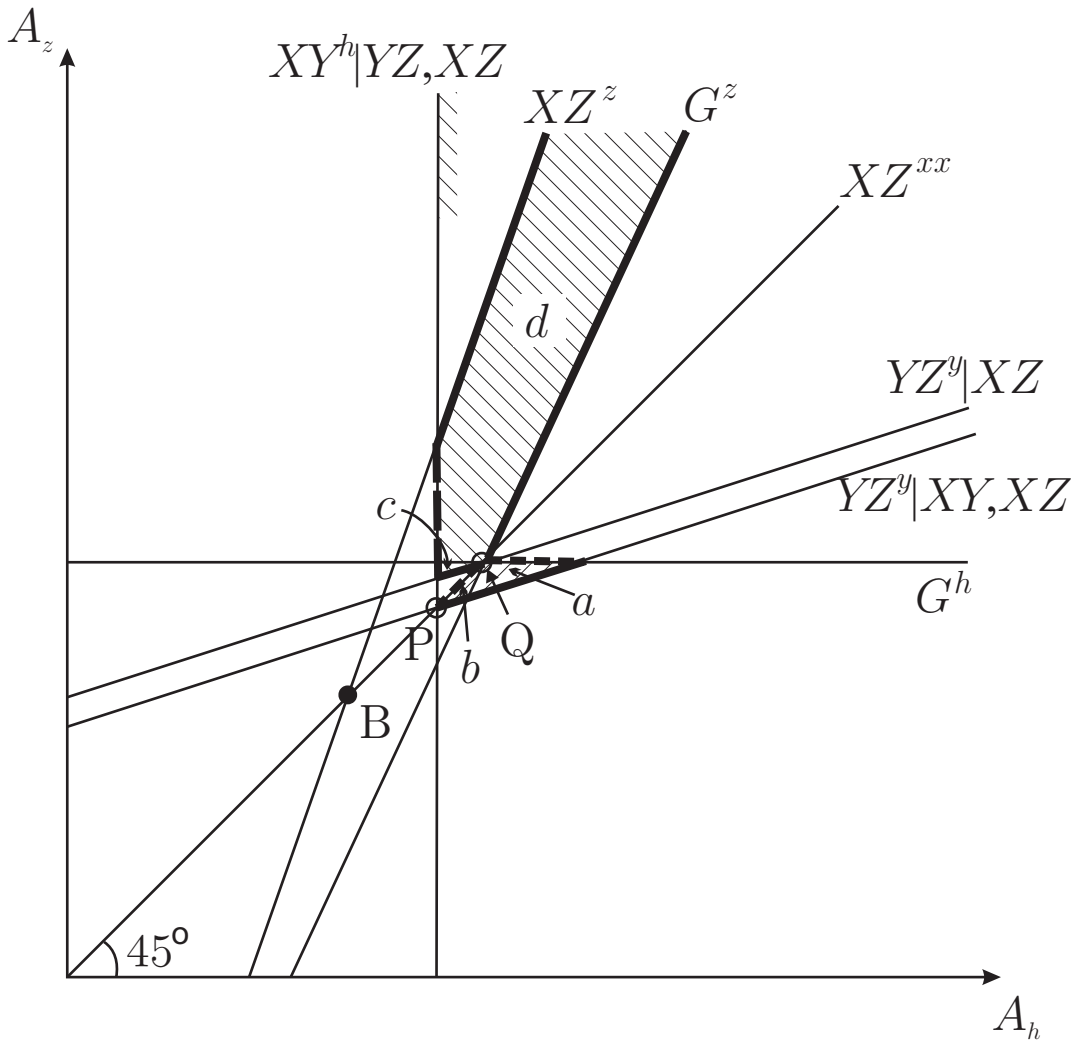

Figure 5 Regionalism as A Building Block
n = 1

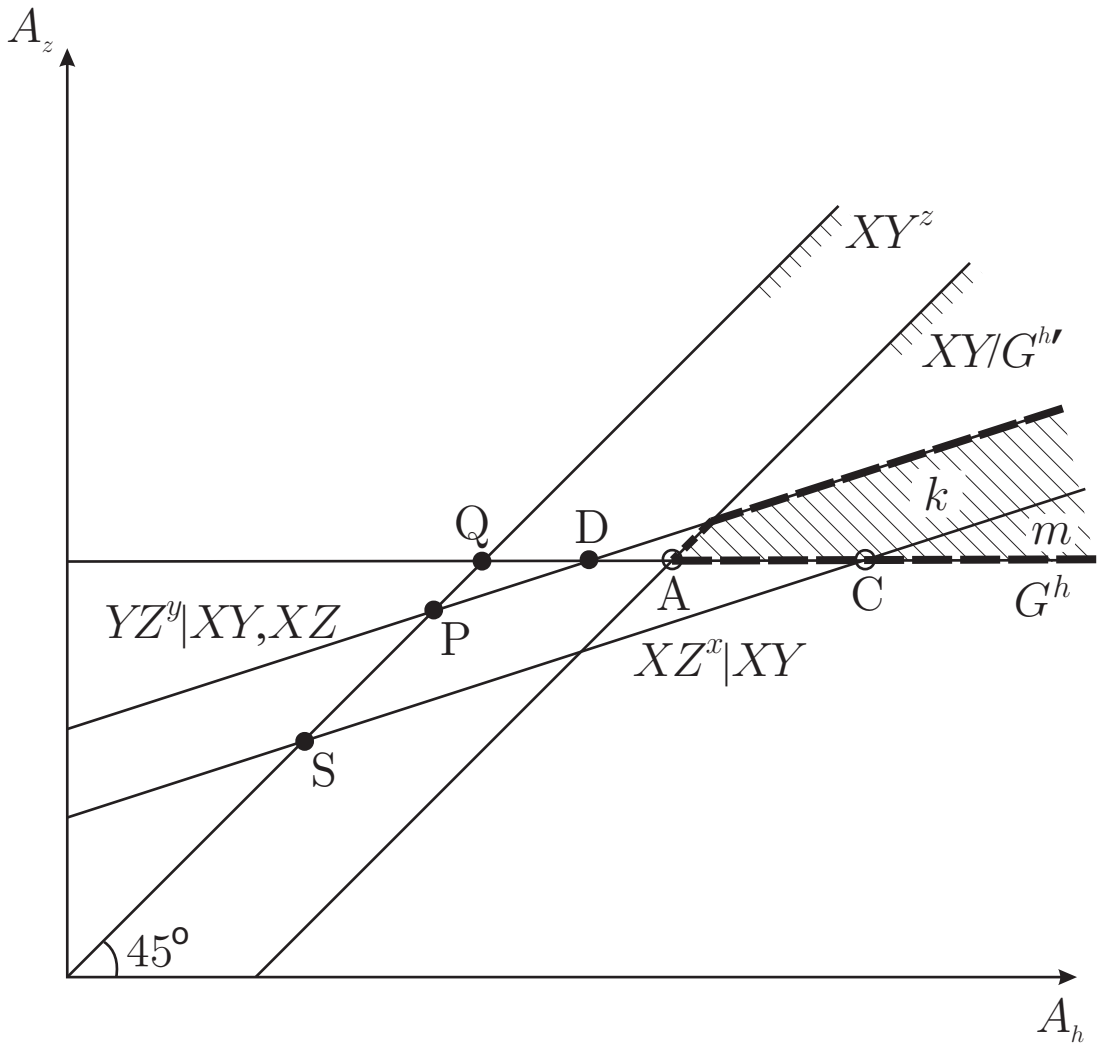

Figure 6 Regionalism as a Stumbling Block, *n* = 1

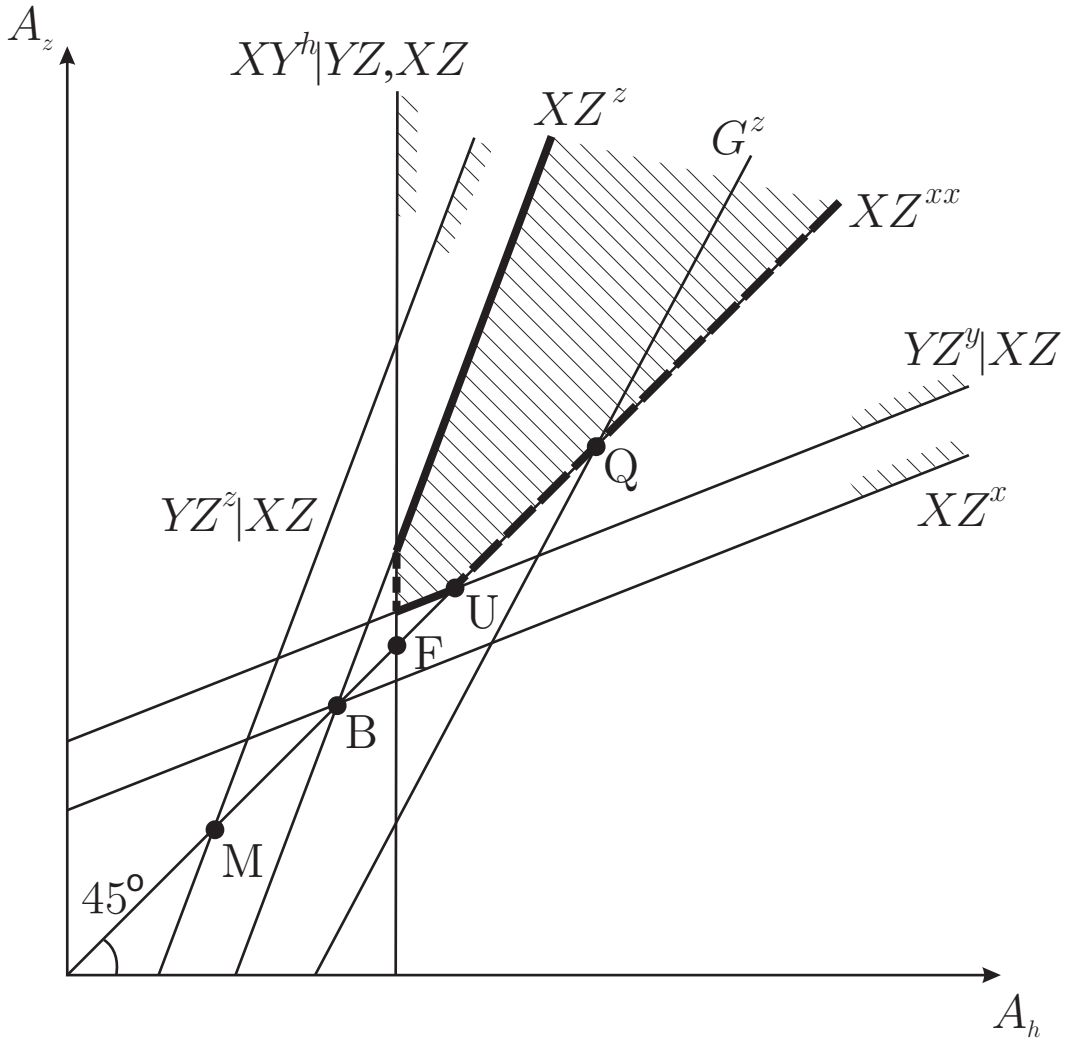

Figure 7 Regionalism Not as a Stumbling Block

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