Asian Economic and Financial Review

journal homepage: http://www.aessweb.com/journals/5002

CAN EMERGING MARKET PROTECTIONISM BE BENEFICIAL?

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ABSTRACT

This paper employs a sequential trade competition model to analyze differential trade effects on an emerging market. We find that free trade is not able to alter the ex post dominance of the foreign incumbents and, conversely, emerging market protectionism will reduce the dominance, and the total world welfare will not be worse off. We also find that a strong import dependency even with competitive domestic production exists in the emerging market unless the foreign competitors are few in number.

Keywords: Free trade, Protectionism, Emerging market, Sequential trade competition model.
JEL Classification: F13, O24.

Contribution/ Originality

Free trade is beneficial because the removal of trade barriers is supposed to facilitate competition, which in terms improves efficiency and social welfare. Despite the prevalent evidence on advantages of free trade, one should not overlook the possibility that at least under certain circumstances, protectionism instead can serve the purpose of improving efficiency as well. Based on the settings of firm size asymmetric and sequential competition in international trade, this paper finds that emerging market protectionism can somehow be beneficial.

1. INTRODUCTION

Whether free trade or protectionism is more beneficial to the emerging market economy is an ongoing debate. We frequently see developed countries encourage emerging markets to open up and embrace free trade. Their Ricardian argument is that, eventually, the fruit of free trade will be shared by all participants involved. Most economists consider protectionism to be harmful since the costs of protectionism outweigh its benefits and therefore impede economic growth. There are ample of literature on the free trade argument such as Corden (1974), Krugman (1987), Bhagwati (1988; 1994; 2002), and Irwin (1991; 2002).

Nevertheless, there is abundant historical evidence suggests that interventionist trade policies did succeed in facilitating economic development such as in South Korea and Taiwan (Amsden, 1989; Wade, 1990; Chang, 2002; 2007). Since the early 1980s, trade theorists have sought to formalize models that consider that a country can improve its welfare by deviating from free trade (Brander and Spencer, 1981; 1985; Ethier, 1982; Krugman, 1984; 1986; Brander, 1986; Eaton and Grossman, 1986; Grossman and Helpman, 1991). The idea is that a country could benefit by protecting a strategic industry that could then bring home monopoly profits from the global marketplace. Government intervention in international trade hence has its theoretical justification. Nonetheless, the theoretical discussion of protectionism is relatively limited in volume. A recent study by Samuelson (2004) expresses a less optimistic viewpoint concerning free trade. In the article, Samuelson applies the same standard Ricardian assumptions but allows for exogenous technology progress. If the low productive country undergoes technology progress in its importing sector, and if the degree of progress is so much that it just offsets the comparative advantage, a reversion to autarky will lower the real per capita income of the high-tech country. Although Samuelson does not explicitly point out protectionism should or should not be introduced. The central idea of Samuelson can be interpreted in an alternative way: in a Ricardian model, where benefits of free trade hinges on the principal of comparative advantage, the very rationale for free trade may as well kill off free trade itself once the comparative advantage changes. The undetermined conclusion of the article also indicates that free trade does not benefit all its participants under any circumstances. Dixit and Kyle (1985) find that protectionism can indeed emerge as equilibrium under the standard assumptions of a two-country imperfect competition model in which different policy schemes and entry sequences are considered. The authors show that except the cases where both countries' dominant strategies are free trade or where the profitable entry condition is relaxed, free trade never emerges as equilibrium, regardless of strategic choices. It is often assumed that by promoting free trade, the growth of the new trading nations will erode the dominance of the foreign incumbents. In international trade, very often, we see that the most developed countries dominate the trade market [1] and those nations are very likely to be the earliest movers in the world. Now consider an emerging market which is experiencing a process of rapid economic growth and industrialization. Suppose that there is a new trading opportunity arising as a result of the surging demand for consumption in this untapped market. Under what conditions the large country dominance (or early entrant dominance) will be reduced is not clearly known. In an emerging market, it is very likely that the industrial infrastructure is limited and that it may not have an adequate production capability/capacity corresponding to the increasing domestic demand. To satisfy its growing demand, an emerging market may have to totally or partially rely on foreign imports. With the growth of domestic manufacturing, whether or not the

[1] The most developed and wealthiest nations are often the major beneficiaries of free trade Krasner (1976). Kindleberger (1981; 1986). Gilpin (1987). Chang (2007).

import dependency will be finally reduced without the existence of barriers to trade is also not clearly known.

In this paper, we employ a sequential trade competition model to analyze the differential trade effects in an emerging market.[2] In international trade, firms in different countries do compete in sequential fashion, and firm sizes are indeed asymmetric. In this paper, we also apply three *ex post* assumptions to show how both developed and developing countries compete with the additional trading opportunity and hence some useful comparisons are drawn. Two of them exhibit an asymmetric trading opportunity where the assumptions of *total import dependency* and *total trade restrictions* are employed. The other assumption is *symmetric opportunity*, by which is meant that after the emerging market opens up, domestic and foreign manufacturers compete on equal terms. In this paper, we find that free trade will not be able to reduce the *ex post* dominance of the foreign incumbents nor will it change the market leadership. It is shown that only through the import restrictions will the privileged domestic manufacturer be able to alter the size structure and hence overcome the dominance of the foreign incumbent. We also find evidence of strong import dependency even with competitive domestic production in the emerging market unless the foreign competitors are few in number. The rest of the paper is organized as follows. Section 2 presents the generalized sequential trade competition model with three *ex post* assumptions. Section 3 presents the sequential trade competition with no trade barriers in the emerging market. In Section 4, we discuss the beneficial emerging market protectionism and Section 5 summarizes the results.

2. THE MODEL

2.1. The *Ex Ante* Set Up

We assume that there are n trading nations supplying a global homogeneous market and competing in a sequential fashion. We assume there is a national monopoly existing in each country.[3] Both firms and countries are indexed by i, $i=1,...,n$, and i also denotes their order of entry. Let the quantity produced by firm i in country i be q_i ($q_i > 0 \ \forall i$). Let the total quantity produced in the world be $Q = \sum_{i=1}^{n} q_i$ and the inverse demand function for the market be $P(Q) = a - bQ$, where $a > 0$ and $b > 0$. Here, all producers' technologies are symmetric and

[2] Many generalized sequential entry models which are akin to the Stackelberg type have been developed. Anderson and Engers (1992). and Boyer and Moreaux (1986). provide solutions to the generalized Stackelberg model. Pal and Sarkar (1998; 2001). analyze the n-firm Stackelberg model with non-identical firms. Other researchers such as Robson (1990). Church and Ware (1996). and Vives (1988). Incorporate sunk costs and analyze the Stackelberg model where the number of firms is determined endogenously.

[3] This can also be regarded as one representative firm in each country.

trading costs are identical. We say that firm i in country i has a cost function $c_i(q_i) = F + cq_i$ where c is a constant ($c \geq 0$) and F is the fixed cost.

2.2. The *Ex Ante* Equilibrium

To play the sequential entry game, firm 1 in country 1 simply selects an output, q_1. In the following periods, firm i in country i $(i \neq 1)$ produces after the country which precedes it $(i-1)$. The respective quantity choices of countries 1 to $i-1$ are taken as given when firm i selects its own output. During the game, firm i in country $\boldsymbol{i}$ is perfectly aware of the number of followers $(n-i)$ prepared to enter the market. At the same time, it is also acknowledged that the output choice of firm $\boldsymbol{i}$ will have an impact on the quantity choices of its followers $(i+1,\ldots,n)$. In order to select the optimal output, the strategy for firm i in country $\boldsymbol{i}$ is a reaction function $R_i(\sum_{j=1}^{i-1} q_j)$ which assigns a level of production according to the quantity choices in all preceding countries. The total output in firms 1 to $\boldsymbol{i}$ is $\sum_1^i q_i$ and the sum of the followers' reaction functions in firms from $i+1$ to n is $\sum_{\substack{k=i+1 \\ i \neq n}}^{n} R_k(\sum_{j=1}^{k-1} q_j)$.

In the game of sequential entry with perfect information, the strategy of firm i in country 1 is simply to choose a level of quantity output. The respective strategies for each of firms 2 through n are the best reactions in terms of quantity supplied given the output choices of preceding firms. The output selection of firm i in country $\boldsymbol{i}$, $\boldsymbol{q_i}$, depends on the output selection of all preceding firms.

(1) $$R_i : \sum_{\substack{k=1 \\ i \neq 1}}^{i-1} q_k \rightarrow q_i \quad \forall i$$

$S_i = \{q_i\}$ is a strategy set for firm i in country $\boldsymbol{i}$ to select its outputs. A subgame perfect equilibrium to this game is a set of strategies, S^*, where each firm's objective is to maximize its profit:

(2) $$S^* = \left(\left(q_1, R_2(q_1), R_3(q_1+q_2), \ldots, R_n(q_1+\ldots+q_{n-1}) \right) \middle| \, Max\, \pi_i, \forall i \right), i = 1, \ldots, n$$

The profit optimizing for firm 1's output choice must satisfy the following condition:

(3) $$q_1 = \arg\max : \pi_1(q_1, \sum_{k-2}^{n} R_k(\sum_{j-1}^{k-1} q_j)) = P\left[q_1 + \sum_{k-2}^{n} R_k(\sum_{j-1}^{k-1} q_j) \right] q_1 - c_1(q_1)$$

To select an optimal output level, it is necessary for firm i in country $\boldsymbol{i}$ to maximize its profit:

(4) $$R_i = \arg\max : \pi_i(\sum_{1}^{i} q_i, \sum_{\substack{k-i+1 \\ i \neq n}}^{n} R_k(\sum_{j=1}^{k-1} q_j)), i = 2, \ldots, n$$

This can also be expressed as:

(5) $$\underset{q_i \geq 0}{Max}\, \pi_i = P\left[\sum_{1}^{i} q_i + \sum_{\substack{k=i+1 \\ i \neq n}}^{n} R_k(\sum_{j=1}^{k-1} q_j) \right] q_i - c_i(q_i)$$

The output selection of firm i, q_i, depends on the output selection of all preceding firms. $R_i : \sum_{\substack{m=1 \\ i \neq 1}}^{i-1} q_m \to q_i$.

The profit optimizing for firm 1's output choice must satisfy the following condition:

(6) $$q_1 = \arg\max : \pi_1(q_1, \sum_{m=2}^{n} R_m(\sum_{k=1}^{m-1} q_k)).$$

Using backwards recursion, the profit of the last firm is $\pi_n = q_n\left[(a-c) - bq_n - b\sum_{k=1}^{n-1} q_k \right] - F$ and hence $q_n = \frac{1}{2b}\left[(a-c) - b\sum_{k=1}^{n-1} q_k \right]$.

For the firm indexed by $n-1$, $\pi_{n-1} = q_{n-1}\left[(a-c) - bR_n - b\sum_{k=1}^{n-1} q_k \right] - F$. Substituting R_n with q_n we obtain:

$\pi_{n-1} = \frac{1}{2} q_{n-1}\left[(a-c) - bq_{n-1} - b\sum_{k=1}^{n-2} q_k \right] - F$ and $q_{n-1} = \frac{1}{2b}\left[(a-c) - b\sum_{k=1}^{n-2} q_k \right]$.

By continuing, we then have $\pi_i = \frac{1}{2^{n-i}}\left[(a-c) - b\sum_{1}^{i} q_i \right] q_i - F$.

Therefore $\pi_1 = \frac{1}{2^{n-1}}\left[(a-c) - bq_1 \right] q_1 - F$ and its first-order condition is $q_1 = \frac{(a-c)}{2b}$. Following Pal and Sarkar (2001) and moving this process forward, we get

(7) $$q_i = \frac{a-c}{2^i b} \quad \text{and hence}$$

(8) $$Q = \sum_{i=1}^{n} q_i = \frac{(a-c)}{b}\left(1 - \frac{1}{2^n} \right).$$

2.3. The *Ex Post* Set Up

Suppose that there is a new trading opportunity raised as a result of the surging demand for consumption in the emerging market and this surging demand, as often seen, is in combination of various factors such as a change in income per capita and/or a change in preferences (tastes).

With the additional trading opportunity, the *ex post* global demand is now $P' = a' - b'Q'$ and cost function is $c'_i = cq'_i + F$, so the marginal cost and the fixed cost are *ex ante* identical.[4] The total number of countries competing is m. To quantify the opportunity, regardless of the causes of the surging demand for consumption, we let $\frac{a-c}{b} = x$, $\frac{a'-c}{b'} = x'$ and $\Delta x = x' - x$. We say that Δx is the magnitude of this new trading opportunity and Δx is also strictly positive ($\Delta x > 0$). The *ex ante* and *ex post* total quantities produced in the world are $Q = x\left(1 - \frac{1}{2^n}\right)$ and $Q' = x'\left(1 - \frac{1}{2^m}\right)$, respectively.

2.4. Assumptions

To analyze various trade effects regarding the competition surrounding the additional trading opportunity, we propose three *ex post* assumptions. Two assumptions are established on the basis that the emerging market is an open economy with no barriers to trade imposed. They are *Total import dependency* and *Symmetric opportunity*. Another assumption that is referred to as *Total import restrictions* indicates that the opportunity generated by this emerging market is entirely satisfied domestically.

Assumption 1: *Total import dependency.* There are no trade barriers and no domestic production available in the emerging market. When the trading opportunity presents itself, all foreign incumbents openly compete for this opportunity.

Assumption 2: *Symmetric opportunity.* Domestic and foreign manufacturers are allowed to compete for the opportunity on equal terms.

Assumption 3: *Total import restrictions.* We assume the emerging market government places trade restrictions on foreign imports into the domestic market. The surging demand for consumption in the emerging market is completely satisfied by the domestic producer.

[4] Even if we set the *ex post* cost function to $c'_i = c'q'_i + F'$, the results of this paper will still remain.

3. EMERGING MARKET UNDER AN OPEN ECONOMY

3.1. Import Dependency

An open economy is an economy that permits trade in goods and services with the outside world. In *Assumption 1*, the trading opportunity is completely taken by the foreign incumbents and no domestic production is present. The *ex post* number of producing nations is $m=n$. Given the new condition x', firm i's output decision is now adjusted to $q^I_{i,i=1,2,\ldots,n} = \frac{x'}{2^i}$ and the total quantity produced in the market is therefore $Q^I = \sum_{i=1}^{n} q^I = x'(1-\frac{1}{2^n})$. ΔQ^I is the total quantity change under *Assumption 1* and it also represents the *ex post* change in the global consumption.

$$\Delta Q^I = Q^I - Q = (x' - x)\left(1 - \frac{1}{2^n}\right) = \Delta x\left(\frac{2^n-1}{2^n}\right) \tag{9}$$

ΔQ^I consists of two parts. One part obviously arises from the domestic consumption that is a direct result of the surging demand from the emerging market (k^I) and the other arises from the surging domestic demand on the rest of the world's consumption. Because ΔQ^I is contributed largely by the heavy domestic consumption in the emerging market, it is therefore reasonable to assume that

$$\Delta Q^I \equiv k^I. \tag{10}$$

The consumption in the emerging market can be expressed in Equation (11).

$$k^I \equiv \Delta Q^I = \Delta x\left(\frac{2^n-1}{2^n}\right) \tag{11}$$

In *Assumption 1*, there is no domestic production established in the emerging market, hence the quantity of k^I is totally imported.

$$import^I = k^I \tag{12}$$

In *Assumption 2*, we assume the existence of competitive domestic production in the emerging market, and therefore $m=n+1$. The new quantity selections of firm i are $q^{II}_{i,i=1..n..n+1} = \frac{x'}{2^i}$ and $Q^{II} = \sum_{i=1}^{n+1} q^{II} = x'(1-\frac{1}{2^{n+1}})$. Therefore $\Delta Q^{II} = x'(1-\frac{1}{2^{n+1}}) - x(1-\frac{1}{2^n})$. The consumption of the emerging market is

$$k^{II} \equiv \Delta Q^{II} \tag{13}$$

and the quantity produced in the emerging market is

(14) $$q_{n+1}^{II} = \frac{x'}{2^{n+1}}.$$

The quantity of imports required under *Assumption 2* can be calculated as

(15) $$k^{II} - q_{n+1}^{II} = import^{II} = x'\left(\frac{2^{n+1}-1}{2^{n+1}} - \frac{1}{2^{n+1}}\right) - x\left(\frac{2^{n}-1}{2^{n}}\right) = \Delta x\left(\frac{2^{n}-1}{2^{n}}\right).$$

By looking at Equation (15), the gruelling fact is that, even with the competitive domestic production, the emerging market will still to a large extent depend on foreign imports. The quantity of imports is determined by x'. That means that the higher the domestic demand is, the more the emerging market craves imports, since the term, $\frac{2^n - 1}{2^n}$ is nearing the value of 1 if n is a large number. That is to say, this imports craving effect can be moderated only if the foreign competitors are few in number.

Furthermore, the domestic consumption under *Assumption 2* is higher than the consumption under *Assumption 1* ($k^{II} > k^{I}$). Having domestic production in the emerging market will introduce more domestic consumption. However, as we can see from Equations (11) and (15), the amount of additional consumption will be almost offset by the exact amount of domestic production.

(16) $$k^{II} - k^{I} = q_{n+1}^{II}$$

As a result, the emerging market will still have to import an identical quantity regardless of the existence of the domestic production. We have

(17) $$import^{II} = import^{I}.$$

Proposition 1: *Under the total exposure of international competition, even with competitive domestic production in the emerging market, the issue of import dependency will still remain unsolved by free trade. The quantity of imports consumed in the emerging market is impartial to the domestic production. If the global market is ex ante concentrated, the domestic import craving effect will be tempered.*

3.2. The Ex Post Foreign Incumbent Dominance

In this part, we will examine the *ex post* dominance to determine whether allowing an additional trading nation to compete in the international market will reduce the dominance of privileged incumbents.

We can derive the *ex ante* and the *ex post* market shares as in Equations (18), (19) and (20). S_i denotes the *ex ante* market share of firm i in country i and $S^{I}_{i,i=1,2,\ldots,n}$ and $S^{II}_{i,i=1,2,\ldots,n,n+1}$ represents the *ex post* market shares for firm i under *Assumption 1* and *Assumption 2*, respectively:

(18) $$S_i = \frac{q_{i,i=1,2,\ldots,n}}{Q} = \frac{x\left(\frac{1}{2}\right)^i}{x\left(1-\frac{1}{2^n}\right)} = \frac{2^n}{2^i(2^n-1)}.$$

(19) $$S^I_{i,i=1,2,\ldots,n} = \frac{q^I_{i,i=1,2,\ldots,n}}{Q^I} = \frac{x'\left(\frac{1}{2}\right)^i}{x'\left(1-\frac{1}{2^n}\right)} = \frac{2^n}{2^i(2^n-1)}$$

(20) $$S^{II}_{i,i=1,2,\ldots,n,n+1} = \frac{q^{II}_{i,i=1,2,\ldots,n+1}}{Q^{II}} = \frac{x'\left(\frac{1}{2}\right)^i}{x'\left(1-\frac{1}{2^{n+1}}\right)} = \frac{2^{n+1}}{2^i(2^{n+1}-1)}$$

One point worth noting is that, assuming constant marginal cost, in Equations (18), (19) and (20), both the *ex ante* and *ex post* market shares are related solely to n. The *ex post* market share of firm i in country i remains unaffected by the condition of x' ($(a'-c)/b'$). The new trading opportunity has no impact on the firm's market share and its distribution. That is to say, the *ex post* market shares of $S^I_{i,i=1,2,\ldots,n}$ and $S^{II}_{i,i=1,2,\ldots,n,n+1}$ are independent of Δx. We also note that, in Equations (21) and (23), the first mover's market share is always greater than that of the followers. Hence, the *ex post* incumbent (first-mover) dominance is still very much apparent when the emerging market is an open economy with no trade barriers.

(21) $$s^I_1 > s^I_2 > \ldots > s^I_{n-1} > s^I_n$$

(22) $$s^{II}_1 > s^{II}_2 > \ldots > s^{II}_n > s^{II}_{n+1}$$

If we look at the *ex post* concentration measures of the u-firm Concentration Ratio[5] and the Herfindahl-Hirschman Index for *Assumption 1* and *Assumption 2*, we have $CR^I_u = \frac{2^n - 2^{n-u}}{2^n - 1}$, $CR^{II}_u = \frac{2^{n+1} - 2^{n+1-u}}{2^{n+1} - 1}$, $HHI^I = \frac{2^n + 1}{3(2^n - 1)}$ and $HHI^{II} = \frac{2^{n+1} + 1}{3(2^{n+1} - 1)}$.

We can prove that:

(23) $$\lim_{n\to\infty} CR^I_u = \lim_{n\to\infty} CR^{II}_u = 1 - \frac{1}{2^u}$$

[5] In most cases, we set $u = 4$ to represent the 4-firm concentration ratio (CR_4).

(24) $$\lim_{n\to\infty} HHI^{I} = \lim_{n\to\infty} HHI^{II} = \frac{1}{3}.$$

If the total number of firms is becoming large, the CR_u of *Assumption 1* and *Assumption 2* will converge to a value of $1-\frac{1}{2^u}$, whereas the HHI in both assumptions will converge to $\frac{1}{3}$. The implication of the convergence is that free trade (an open economy with no trade barriers) will hardly change the *ex post* concentration when the market contains too many firms.

Proposition 2: *Under free trade, the emerging market will not be able to erode the large country dominance (or early entrant dominance) in the international market, regardless of the scale of the surging domestic demand to consume and the competitiveness of the domestic production. The ex post global concentration (market power) will remain unaffected under free trade if the global market structure was ex ante un-concentrated.*

4. TOTAL IMPORT RESTRICTIONS

4.1. The Ex Post Dominance and Concentration

In *Assumption 3* of the emerging market protectionism, we assume that the consumption in the emerging market is entirely satisfied by its own domestic production where $k^{III} = q_{n+1}^{III}$ and there are no foreign imports, which means that foreign incumbents are producing at the *ex ante* level where $q_{i,i=1,2,...,n}^{III} = \frac{x}{2^i}$. The total quantity produced in the world is $Q^{III} = \sum_{i=1}^{n+1} q_{i,i=1,2,...,n+1} = x'(1-\frac{1}{2^{n+1}})$. Hence, we have the quantity of domestic production as

(25) $$q_{n+1}^{III} = Q^{III} - \sum_{i=1}^{n} q_{i,i=1,2,...n}^{III} = x'(1-\frac{1}{2^{n+1}}) - x(1-\frac{1}{2^n}).$$

The global market share of the manufacturer in the emerging market is as follows:

(26) $$S_{n+1}^{III} = \frac{x'(1-\frac{1}{2^{n+1}}) - x(1-\frac{1}{2^n})}{x'(1-\frac{1}{2^{n+1}})}$$

For $i = 1,...,n$, $S_1^{III} > S_2^{III} > ... > S_n^{III}$. In some extreme cases, there is even a possibility that the late entrant $(n+1)$ can replace the leadership of firm 1 where $S_1^{III} - S_{n+1}^{III} < 0$. The *ex post* quantity leadership can be derived as in Equation (27).

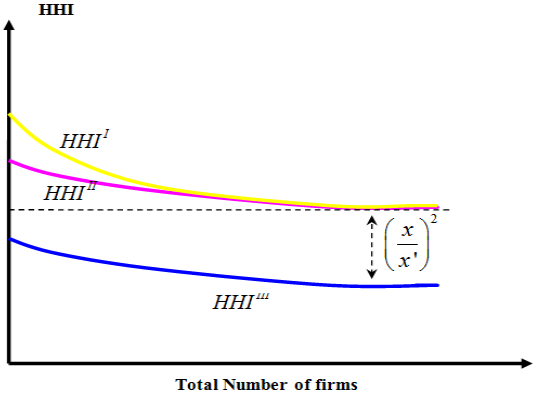
(27) $$S_1^{III} - S_{n+1}^{III} = \begin{cases} \frac{x}{x'}(1+\frac{2^n-1}{2^{n+1}-1})-1>0, \ if \ \ \frac{x'}{x}<1+\frac{2^n-1}{2^{n+1}-1} \\ \frac{x}{x'}(1+\frac{2^n-1}{2^{n+1}-1})-1<0, \ if \ \ \frac{x'}{x}>1+\frac{2^n-1}{2^{n+1}-1} \end{cases}$$

The latecomer in the emerging market can be the world market leader provided that the requirement that $\frac{x'}{x}>1+\frac{2^n-1}{2^{n+1}-1}$ is satisfied and this delicately depends on the *ex post* condition of x'. However, even if the magnitude of the surging demand for consumption in the emerging market, Δx, is not large enough to sustain the requirement that $\frac{x'}{x}>1+\frac{2^n-1}{2^{n+1}-1}$, it is also highly feasible that the global market share of the emerging market might surpass that of its predecessors ($S_{n+1}^{III} - S_{i,i=1,\ldots,n}^{III} \geq 0$). That is to say, the late entrant who possessed the advantage of domestic protectionism will be able to alter the size structure. It is the existence of the privileged manufacturer in the emerging market which has the effect of reducing the international market dominance.

If we compare the Herfindahl-Hirschman Indexes, it can be mathematically proven that $HHI^I > HHI^{II} > HHI^{III}$, provided that $x'>x$. It is most important to note that the HHI^{III} of *Assumption 3* contains the least concentrated structure of all three indexes (see Figure 1). If the number of firms is becoming too large, HHI^{III} will converge to a certain value as in Equation (28):

(28) $$\lim_{n\to\infty} HHI^{III} = \frac{1}{3}\times\left(\frac{x}{x'}\right)^2$$

Figure-1. A comparison of the *ex post HHI*s



$\frac{1}{3}\times\left(\frac{x}{x'}\right)^2$ is the lowest bound of HHI^{III}. The gap within the lowest bounds between HHI^{I}/HHI^{II} and HHI^{III} is, therefore, the value $\left(\frac{x}{x'}\right)^2$. If emerging markets are growing particularly fast and/or are large in size (therefore Δx will be higher), the lowest bound of HHI^{III} will be even lower.[6] This means that when the emerging market adopts total import restrictions, the condition of a higher Δx will result in an exponentially less concentrated structure in the global market. This leads us to Proposition 3:

Proposition 3: *Import restrictions imposed by the emerging market can prove to be beneficial to international trade. They will certainly have the effect of altering the size structure and reducing dominance and concentration in the international market. If the emerging market has high growth potential and/or a large market size, employing the tighter import restrictions policy will be even more rewarding.*

4.2. Total World Welfare

If domestic protectionism could lead to a plausible outcome on *ex post* dominance, any good economists would certainly raise the inevitable question: What about the welfare? The following will illustrate three levels of *ex post* total world welfare.

The *ex post* world consumer's surplus and world producer's surplus of *Assumption 1* are

$$CS^I=\int_{p^*}^{a'}Q(p)dp=\frac{(a'-c)^2(2^n-1)^2}{2^{2n+1}b'}$$

$$PS^I=TR-\int_0^{Q^*}MC(Q')dP'=p^**Q^*-TVC=(p^*-c)*Q^*=\frac{(a'-c)^2(2^n-1)}{2^{2n}b'}.$$

The *ex post* total world welfare of *Assumption I* is hence

(29) $$W^I=PS^I+CS^I=\frac{(a'-c)^2(4^n-1)}{2^{2n+1}b'}.$$

We can also determine the welfare for each of *Assumption I and Assumption III* as follows:

$$CS^{II}=\frac{(a'-c)^2(2^{n+1}-1)^2}{2^{2n+3}b'},\ PS^{II}=\frac{(a'-c)^2(2^{n+1}-1)}{2^{2n+2}b'}\ \text{and}$$

[6] There are numerous examples of emerging markets which are growing rapidly and are large in size such as the BRIC countries (Brazil, Russia, India, and China).

(30) $$W^{II} = PS^{II} + CS^{II} = \frac{(a'-c)^2(4^{n+1}-1)}{2^{2n+3}b'}.$$

$CS^{III} = \frac{(a'-c)^2(2^{n+1}-1)^2}{2^{2n+3}b'}$, $PS^{III} = \frac{(a'-c)^2(2^{n+1}-1)}{2^{2n+2}b'}$ and

(31) $$W^{III} = PS^{III} + CS^{III} = \frac{(a'-c)^2(4^{n+1}-1)}{2^{2n+3}b'}.$$

We can then compare these three levels of *ex post* total world welfare and find that: $W^I < W^{II} = W^{III}$. Having an additional competitive trading nation in the global market will have the benefit of increasing total welfare. We also note that the *ex post* world consumer's surplus and world producer's surplus will not be diminished under domestic import restrictions. By allowing protectionism in the emerging market, the level of total world welfare will not be reduced!

Proposition 4: *The total world welfare will not be worse off than under free trade when the emerging market adopts total import restrictions.*

With a sequential trade competition model, this paper attains to produce some interesting but yet robust results. The richness of such findings lies in the heart of the underlining characteristics of the trade competition. Unlike the Cournot trade competition models where firms in different countries compete in simultaneous fashion, and firm sizes are identical, in international trade, firms in different countries do enter and compete in sequential order and firm sizes are indeed asymmetric. The Stackelberg settings can prove to be more general and reasonable to assume in international trade, rendering it coherent to represent and capture the essence of trade competitive behaviors. Owing to the very nature of the competition assumption, the findings in this paper can only be possible.

5. CONCLUDING REMARKS

Protectionism has often been criticized for harming the people it is meant to help. Based on the settings of firm size asymmetric and sequential competition in international trade, this study finds that free trade will not be able to reduce dominance in the international market. It is also shown that if the emerging market is growing rapidly and/or is large in size, a tighter domestic protectionism policy might even be more plausible for achieving a reduction in international dominance. By protecting a strategic domestic industry, government intervention in international trade could have the potential to help improve the international well-being.

People often consider that free trade helps developing countries. Free trade is beneficial because the removal of trade barriers is supposed to facilitate competition, which in terms improves efficiency and social welfare. Despite the prevalent evidence on advantages of free trade, one

should not overlook the possibility that at least under certain circumstances, protectionism instead can serve the purpose of improving efficiency as well.

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