

# A Dumping Model for Accelerating Economic Development

— A Phase of Korean Export since 1962 —

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## I. Foreword

It is highly appreciated that the export of Korea has been greatly increased since 1962. Average annual expansion rate of about 40% has been achieved without any local special-product to promote the export quickly. But some one might be disappointed at the result, if he would scrutinize the background of the export expansion. Export firms have enjoyed many immoderate privileges given by the government,<sup>1)</sup> and the firms could get much returns, even though they exported their goods at very low price-dumping.

Some blame the result of the export expansion, pointing out that, owing to the immoderate dumping export, the rate of net inflow of foreign exchange has been greatly reduced,<sup>2)</sup> and that the exporters, selling their goods at a price which is about one third of domestic price, exploit the domestic consumers, and distribute charity to the foreigners.

But this argument should not be entirely supported, because the dumping export might be very beneficial to the developing countries in many cases. The dumping might be profitable to the firms and to the whole economy, accelerating economic development.

This paper shall be devoted to analyze the advantages of dumping by the developing countries.

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- 1) It is well known that in order to promote the export, most governments give the export firms some privileges on tax, on subsidy, on import. etc.. But it is thought that the privileges offered to the export firms in Korea are immoderate, if it can be said that those in other countries are moderate.
  - 2) A large part of raw materials of the goods exported are imported, while export prices are immoderately low,

## II. Underdeveloped Countries and the Vicious Circle of Poverty

The well-known term 'the vicious circle of poverty' was originated by R. Nurkse to depict the characters of underdeveloped countries intensively.

He says that 'the most important circular relationships of the poverty' are those that afflict the accumulation of capital in economically backward countries. The supply of capital is afflicted with the small capacity to save, resulting from the low level of real income. The demand for capital is afflicted with the small inducement to invest resulting from the small buying power of the people because of their small real income.<sup>3</sup>

As the most important factor which would keep up 'the vicious circle of poverty' and obstruct economic development, he pointed out the small size of domestic market, the small buying power of the people, which would discourage the inducement to invest.<sup>4</sup>

The limited size of the domestic market will constitute an obstacle to the application of modern capital equipment by any individual firm or industry working for that market. It can not be denied that the small size of domestic market is obstructive to economic development. But his proposal to get rid of the obstacle is unrealizable and criticized by many development theorists. He insists upon that 'the market can be enlarged only through an all-round increase in productivity'<sup>5</sup>) or a simultaneous investment all over the industries. He thinks the simultaneous investment can make the complimentary demands among the industries and an enlargement effect of domestic market.

A.O. Hirschman criticized the simultaneous investment; "If a country were ready to apply the doctrine of balanced growth (simultaneous investment all over the industries), there it would not be underdeveloped in the first place", referring to Singer's writing 'the initial resources for simultaneous developments on many fronts are generally lacking' in the underdeveloped countries.<sup>6</sup>)

The developing countries are generally longing not for a steady but for a rapid development and a modernization of their industries to catch up with the advanced. They are too far behind to take a path of slow-but-steady advance. They will introduce modern equipments of production into their industries, which are generally designed for large scale production.

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3) R. Nurkse, *Problems of Capital Formation in Underdeveloped Countries*, Basil Black Well, Oxford, 1960, pp. c4~5, cf.

4) R. Nurkse, *Ibid*, Chapter I. f.

5) R. Nurkse. *Ibid*, p.9.

6) A. O. Hirschman, *The Strategy of Economic Development*, Yale University Press, New Haven and London, 1963, pp. 53~54.

Many kinds of modern industrial products are, actually, produced only with the modern equipment. And, in order to strengthen the competitive power of export at foreign markets, the developing countries will keenly feel the necessity of the modern equipment. In such circumstances, the small size of domestic market must be a serious obstruction to the economic development. The mass volume of product that the large scale production will bring must be sold both in the domestic market and in the foreign in any way. But there are many obstacles in cultivating the foreign market in order to overcome the small size of the domestic market. Owing to the low level of technologies and of productivities, the products in underdeveloped countries are generally thought to be crude and to be relatively high cost.

With such an unfavourable situation, is it, indeed, possible to cultivate foreign market to enlarge the demand of firms? It will be impossible to expect a positive answer. But this paper shall make an overture to give a hopeful idea on the theoretical level for increasing the demand of firms and eliminating the obstacles to the inducement of investment.

### III. A Dumping Model for Economic Development

The phrase 'the small size of market' compared with the capacity of productive equipment indicates that average cost curve is above the demand curve of domestic market all over its range, and that the goods can not be sold at the price which covers cost of production. That is to say, the price in the domestic market is lower than the average cost even under the optimum size. One of the difficulties in cultivating the foreign market is that the average cost is higher than the price at which the product can be sold in the foreign market. And, owing to the inferior quality of goods resulting from low level of technologies, it will be thought that the price is lower than that of same line goods produced in advanced countries. The characteristics of the firm with the modern equipment of production in the underdeveloped countries are depicted in Figure 1. On the horizontal axis the quantity of product (=the volume of sales) and on the vertical the price and the average cost are measured.  $D_1$  is the domestic demand curve, which is depicted as a downward straight line owing to the assumption that the firm is under monopolistic conditions in the domestic market in consequence of the prohibitions of import and of tariff barriers on the same line of foreign goods.  $D_2$  is the foreign demand curve, which is depicted as a straight line parallel to the horizontal axis owing to the assumption that the firm is under the condition of perfect competition because the firm will compete with many foreign firms in the foreign market. And according to the assumption of the crudeness of its

product, the foreign demand curve of it,  $D_2$ , will be lower than the demand curves

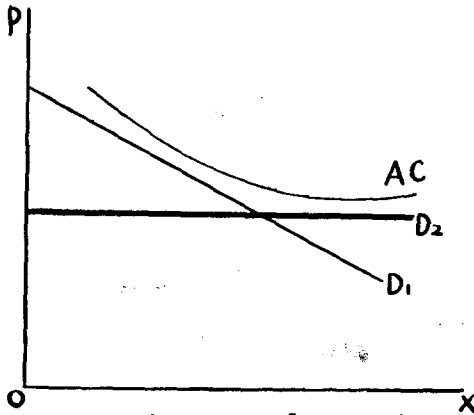


Figure 1

of the firms of advanced countries. AC is the average cost curve, which is above two demand curves, both domestic and foreign, all over its range, so that there is no price which covers the average cost at any level of output.

Whether or not profits are made depends upon the relationship between the market demand curve faced by the firm and its condition of cost. In figure 1 the firm's cost is so high, its domestic market is so small, and the price of its product in the foreign market is so low that at no output will price cover the average costs.

Under the conditions assumed above, could the firm survive?. To answer the question is the main analytical process of this paper.

The rate of profit is the first factor that controls the behaviours of a firm. Therefore, we can say that the firm must be able to get profit as the first condition for its existence. For convenience sake, at first, answer the question, putting off the theoretical analysis later.

In short, dumping at the foreign market, the firm may survive and be able even to get excess profit. Of course, we need not any assumption of the subsidy and other privileges given by the government, not excluding the import prohibition which keeps out the reimport of exported goods. For precision, let us put the mathematical ground of the theory forward. The following symbols are the variables associated with demand and cost of the firm, and they are all assumed to be continuous.

$X_1$ =sales volume in domestic market (=supply volume to domestic market)

$X_2$ =sales volume in foreign market (=supply volume to foreign market)

$X$ =the volume of total sales (=total supply= $X_1 + X_2$ )

$P_1$ =domestic equilibrium price

$P_2$ =foreign equilibrium price

$R_1$ =domestic revenue

$R_2$ =foreign revenue

$R = R_1 + R_2 = \text{total revenue}$

$C = \text{total cost}$

$G = \text{total profit}$

And, we get the equation;

$$G = R_1 + R_2 - C \dots\dots\dots(1)$$

If we assume that the firm seeks that output for which the profit is to be a maximum, we should have

$$\left. \begin{aligned} \frac{\partial G}{\partial X_1} &= \frac{\partial R_1}{\partial X_1} - \frac{dC}{dX} \cdot \frac{\partial X}{\partial X_1} = 0 \\ \frac{\partial G}{\partial X_2} &= \frac{\partial R_2}{\partial X_2} - \frac{dC}{dX} \cdot \frac{\partial X}{\partial X_2} = 0 \end{aligned} \right\} \dots\dots\dots(2)$$

where  $\frac{\partial X}{\partial X_1} = 1$ , and  $\frac{\partial X}{\partial X_2} = 1$ ,

and we have

$$\left. \begin{aligned} \frac{\partial R_1}{\partial X_1} &= \frac{dC}{dX} \\ \frac{\partial R_2}{\partial X_2} &= \frac{dC}{dX} \end{aligned} \right\} \dots\dots\dots(3)$$

The equations (3) indicate that, in order to get maximum profit, the firm must adjust both price and output so that marginal cost equals to marginal revenue of each market.

And we, also, have equation of total market, both domestic and foreign.

$$G = R - C \dots\dots\dots(4)$$

The condition for maximum profit of the equation (4) is

$$\frac{dR}{dX} = \frac{dC}{dX} \dots\dots\dots(5)$$

From equations (3) and (5), we get

$$\frac{dR}{dX} = \frac{dC}{dX} = \frac{\partial R_1}{\partial X_1} = \frac{\partial R_2}{\partial X_2} \dots\dots\dots(6)$$

where  $\frac{dR}{dX}$  is the marginal revenue from the entire sales volume,  $\frac{dC}{dX}$  is the marginal cost,  $\frac{\partial R_1}{\partial X_1}$  is the marginal revenue from domestic market, and  $\frac{\partial R_2}{\partial X_2}$  is the marginal revenue from foreign market.

The equation (6) indicates that, for the maximum profit, the entire marginal revenue must be equal not only to the marginal cost, but also to both the domestic marginal revenue and the foreign.

In Figure 1, the demand curve for the foreign market is parallel to horizontal axis because of the condition of perfect competition assumed, and the foreign marginal revenue is equal to the price for the foreign market.

Now we can say that the conditions of maximum profit are sufficed where the marginal cost are equal to the price for foreign market. If we draw the marginal revenue curve and the marginal cost curve in the regular way on the Figure 1, we get the Figure 2. In Figure 2,  $M_1$  is the domestic marginal revenue curve,  $M_2$  the foreign marginal revenue curve, and  $MC$  the marginal cost curve. For the maximum profit, the firm will sell  $OX_1$  in the domestic market at the price  $OP_1$  and  $X_1 X_2$  for the foreign market at the price  $X_2 P_2$ .

The part shadowed with left-downward lines depicts the profit acquired from domestic market, and the part shadowed with right-downward lines depicts the amount

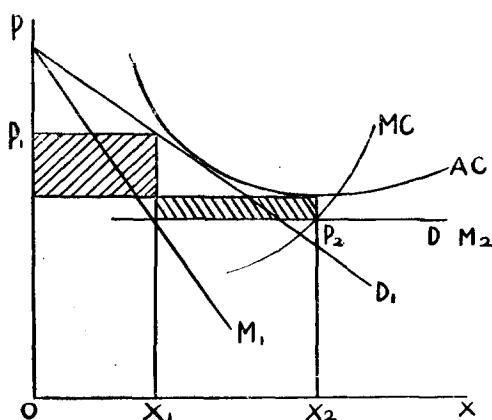


Figure 2.

From equation (6) we get

$$\frac{\partial R_1}{\partial X_1} = \frac{\partial R_2}{\partial X_2} \text{ or } P_1 \left(1 - \frac{1}{E_1}\right) = P_2 \left(1 - \frac{1}{E_2}\right),$$

Where  $P_1$  is the domestic price and  $P_2$  the foreign price, and  $E_1$  is the elasticity of demand of domestic market and  $E_2$  that of foreign market.

The equation is reduced to

$$P_1 = \frac{P_2}{\left(1 - \frac{1}{E_1}\right)} \dots\dots\dots (7)$$

because the elasticity of foreign market " $E_2$ " is infinite according to the assumption. The equation (7) indicates that the domestic price must be higher than the foreign price since the elasticity of domestic market is bigger than unit and smaller than infinity. Therefore, we can say that the firm will take a policy of dumping export for the profit maximization. Thus, it is proved that the firm will not only survive but also take an excess profit. As the economy gradually develops, the domestic market will be enlarged and the technical progress will be achieved, and the firm

of loss occurred from the foreign market owing to the dumping export. The net profit must be the domestic profit minus the foreign loss. The Figure 2 suggests that the firm will be able to get much net profit, and to be prosperous.

will be able to reduce the domestic price and to run the productive equipment without dumping export.

The dumping theory analyzed above is based on the assumption of monopolistic condition in domestic market and of perfect competition in foreign market. Even if we change the assumption about the foreign market, perfect competition, into monopolistic competition, a downward-but-elastic demand curve, there would be no fundamental change of the theory. Let us assume that a firm has a little monopolistic factor in the foreign market because of brand image, quality of goods, and the level of development and technical progress of the country to which the firm belongs, and that the firm has a demand curve sloping down from left to right for the foreign market, which is, of course, much more elastic than the domestic demand curve. For such a case, Professor Stigler presented a theory of price discrimination. Also in Stigler's case, the average cost curve is above two demand curves, "domestic and foreign", over its whole range. But his analytical method is too simple to persuade us the rationality of price discrimination or dumping.<sup>7)</sup> Even in such a case, our dumping model will clearly show the rationality, demonstrating the firm taking excess profit.<sup>8)</sup>

It is, of course, clear that, if the average cost curve is below the domestic demand curve over a part of range, the profit is acquirable without dumping, and that, in that case, the dumping export may bring much more profit.

#### **IV. Oligopolist's Return from Dumping Export**

There are many theories about oligopolist's price determination: entry-preventing price, administered price, kinked demand curve and rigid price, full cost price, revenue maximization price, and some kinds of duopolist's price. But we can not yet find any conclusive one among them.

Therefore, it is very difficult to take a theoretical approach to oligopolistic behaviour. But it is most likely to say that 'the kinked demand curve and rigid price' theorized by Dr. Sweezy is the most widely accepted one among the theories, even though there is a powerful criticism presented by G. J. Stigler who submitted to empirical tests the assumption of entrepreneurial behaviour underlying the theory of the kinky

7) G.J. Stigler, the Theory of Price, the Macmillan Company, New York, 1946, pp. 218~9.

8) H. Park, "A Dumping Theory for the Economic Development of the Developing Countries", in The University Journal of Pusan University, Vol. 10, 1969, p. 293.

demand curve and the implications of the kink for price behavior.<sup>9)</sup> And most other theories have not presented any definite demand curve in the case where no coalition is among oligopolists.

So, it is quite reasonable that we will take the kinky demand curve and rigid price in order to theorize the oligopolist's return from dumping export. According to the theory of kinky demand curve, an intensive desire to prevent the loss from price war brings the rigidity of price in the oligopoly, and the price rigidity is an essential aspect of 'normal' oligopolistic price strategy.<sup>10)</sup> Therefore, we might say that the oligopolist would not change its price and profit volume if there were no fundamental change of cost and demand conditions. But there is a device that an oligopolist may increase his sales and profit without bringing about any price war among competitive oligopolists in the domestic market, taking the procedure of dumping export to raise the level of output. The device is a way that an oligopolist, exporting his product at the price lower than its cost, and preserving the domestic price higher than its cost in order to prevent price war, carries out the managerial rationalization. Figure 3 shows the oligopolist's return from dumping export. It is drawn by superimposing the average cost curve AC, the marginal cost curve MC and the foreign demand curve  $D_2$  on the kinky demand curve  $D_1$ . The foreign demand curve  $D_2$  is below the average cost curve all over its range and parallel to the horizontal axis. This means that, if the oligopolist wants to export, it must sell its

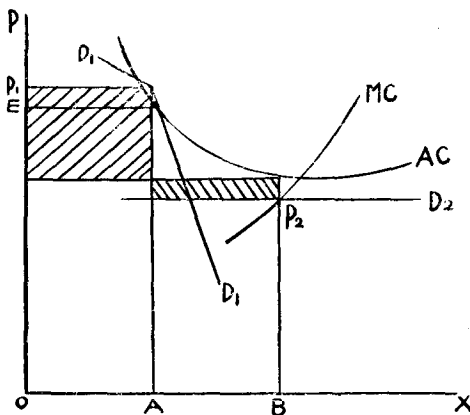


Figure 3.

products at the price lower than the cost, and that it is under the condition of perfect competition in the foreign market. Under such a condition of cost and demand, let us scrutinize the oligopolist adjustment of price and sales (=output) to get a maximum profit, the firm's equilibrium.

9) G.J. Stigler, "The Kinky Oligopoly Demand Curve and Rigid Price," in the Readings in Price Theory, selected by a Committee of the American Economic Association. Richard D Irwin, INC. Chicago, 1952, pp. 421~427.

10) K.W. Rothschild, "Price Theory and Oligopoly" in the Readings in Price Theory, 1952, p. 455.



Considering the condition of domestic market only, the oligopolist would get the volume of profit  $PE \cdot OA$ , selling the quantity of goods  $OA$  at the price  $P_1O$ . It is natural that the oligopolist should get profit in the domestic market because the kinky demand curve is above the average cost curve at some range. But there is no possibility of getting profit in the foreign market, because the foreign demand curve  $D_2$  is below the average cost curve  $AC$ .

If the oligopolist takes the two markets, both domestic and foreign, he could get much more profit through dumping export. According to the theory of the kinky demand curve, an effort to preserve the price unchanged is known to us as "the normal oligopolistic price strategy". For the price cut-down and the sales readjustment would bring a price war in the oligopoly. But an intelligent oligopolist would be able to increase his profit and to promote his sales through dumping export at the price which is lower than the average cost. It will never induce the price war because the domestic price will be unchanged.

The conditions of profit maximization of the oligopolist are fulfilled when the marginal cost is equal to the two marginal revenues, both domestic and foreign, ( $MC=MR_1=MR_2$ ). According to the assumption of perfect competition in the foreign market, the foreign demand curve is parallel to the horizontal axis, and the foreign marginal revenue is equal to its foreign price. The domestic marginal revenue curve which is derived from the kinked demand curve will, of course, be discontinuous where the demand curve is in corner. The marginal cost curve ( $MC$ ) may pass between the two parts of the marginal revenue curve, and it is not possible to apply the equilibrium condition that marginal cost equals to marginal revenue to firm's behaviour. Consequently, "any disturbance which affects only the position of the marginal cost curve may leave the short-run equilibrium of price and output entirely unaffected".<sup>11)</sup>

Therefore, the condition of oligopolistic equilibrium will be fulfilled when the oligopolist produces its output at the level where the marginal cost equals to the foreign price (=foreign marginal revenue  $MR_2$ ), and keeps the domestic sales volume as usual, selling the rest of the output in the foreign market at the price which is lower than average cost. In the Figure 3, the output (=total sales) being  $OB$ , domestic sales is  $OA$  at the price  $OP_1$  and foreign sales is  $AB$  at the price  $BP_2$ .

According to such an adjustment of price and output, the volumes of the profit and the loss are depicted in the Figure 3. The shadowed area with left-downward lines is the volume of profit in the domestic market, and one with right-downward lines is the volume of loss in foreign market due to dumping. The profit is much

11) P.M. Sweezy, "Demand under Conditions of Oligopoly", in the Readings in Price Theory, p. 406.

bigger than the loss, and the oligopolist could get much more net profit bigger than the volume of profit  $P_1E \cdot OA$  that would be occurred only through the equilibrium adjustment of domestic market. Consequently we can say that the oligopolist could increase its profit and sales through dumping export. By increasing sales volume, the oligopolistic firm can raise the working rate of productive equipment and get more profit through the cost cut due to the law of mass-production. The price-cut in the domestic market might induce the retaliatory reactions of the competitive oligopolists, but the sale at a low price in the foreign market would generally not induce any retaliatory measure because of the image of the "crude goods" from underdeveloped countries.

## V. Introduction of Large Scale Productive Equipment and the Dumping Export

It could be said that the economic development of underdeveloped countries is the process of substituting the modern methods of production for the old-fashioned. Generally speaking, the old-fashioned (obsolete) methods of production are connected with the old-fashioned equipments of production, and the modern methods of production are realized with the modern large-scale equipments which are, in general, designed for mass-production.

Suppose that an industry is the oligopoly composed of small number of firms which are equipped with old-fashioned productive equipments, and that the firms have kinky demand rigid prices. And suppose that one of the firms introduces a modern large-scale equipment substituted for an old-fashioned one, that there is no quality discrimination between the product from the old-fashioned equipment and the product from modern one, and that there is not any impact to change the condition of demand.

Hence, the oligopolistic firm will have the existing kinky demand curve unchanged and a new average cost curve greatly changed. In Figure 4,  $D_1$  is the existing kinky demand curve for domestic market, and  $D_2$  is the foreign demand curve drawn under the assumption of perfection as in the above section.  $AC_1$  is the average cost curve from the existing old-fashioned equipment, and  $AC_2$  is one from the modern equipment newly introduced.  $MC$  is the marginal cost curve derived  $AC_2$ , the new average cost curve. And then, with the old-fashioned equipment the firm will be able to take the condition of equilibrium (profit taking) in the domestic market, because the domestic demand curve  $D_1$  comes in contact with the old average cost curve  $AC_1$  at the sales volume  $OA$ . But with the new modern equipment (a process of economic development)

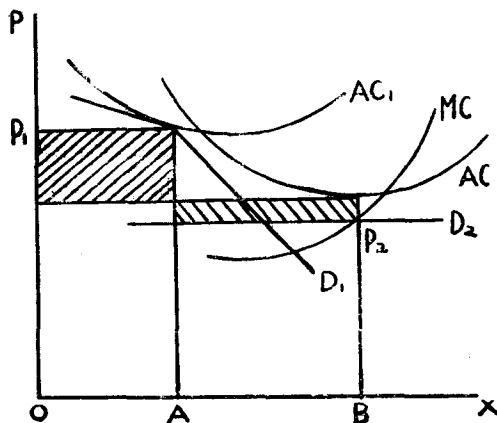


Figure 4.

cost. And it seems that there is no inducement of the introduction of modern equipment or the industrial development.

But according to our dumping model, there is a possibility that the large scale modern equipment would bring much more profit than the old-fashioned one.

By having produced output OB the firm would sell OA at the price  $OP_1$  in the domestic market and AB at the price  $BP_2$  in the foreign market. The shadowed area with left-downward lines shows the volume of profit in the domestic market, and the area with right-downward lines is the volume of loss in the foreign market due to dumping. The profit from domestic market is bigger than the loss from foreign market, and there will be net profit. Having introduced the modern productive equipment, the firm could increase sales and profit to a great degree. But there would not be any change of domestic price and sales and any unfavourable reaction from competitive firms in the domestic market. There would only be the increase of profit and sales of the innovative firm. From the national economic view point the modernization of industry and the increase of employment would be accomplished. It is also clear that innovative firm could expell the competitive oligopolists from the industry and increase the rate of market share through price war if the firm would want to do so.

## V. Conclusion

They say that the underdeveloped countries have, in general, small size of domestic market because of the low level of their productivity. In this circumstance if a firm installs a modern large-scale productive equipment, the average cost is, in many

it is doubtful whether the firm will be able to take a condition of equilibrium, because the new average cost curve is above the two demand curves, domestic and foreign, all over its range. There is, that is, no price which covers the average

cases, very high, because the firm can not operate the equipment in its full capacity. Because of the small size of domestic market and of the low level of productive operation, there is, in many cases, no demand price which covers the average cost. We may think that, by exporting a part of output to the foreign market, the firm will operate in its full capacity and reduce its average cost. But even in the foreign market, there will be, in many cases, no demand price which covers the lowest average cost, because of low productivity. The firm can export only at the foreign demand price which is lower than its average cost. Therefore it seems that even in the condition of composite market (domestic and foreign) there is no demand price which covers the cost. And it is not likely that the firm can achieve both ends and that the modern large-scale productive equipment is effectively operated in underdeveloped countries. If we define "economic development" as "the process of change of one type of economy into some other more advanced type",<sup>12)</sup> then we can also define "the industrial modernization" as "the process of substitution of modern large scale productive equipment for the obsolete type". Therefore, it will be said that smallness of domestic market is a serious obstacle to the industrial modernization and the economic development. To make compensation for a possible loss that might occur, the government of the underdeveloped country sometimes gives subsidy and some privileges to the firms which are bound to install modern productive equipment. This will be a prudent policy if the modern productive equipment is indispensable to the economic development.<sup>13)</sup> I believe that this dumping model presents a theoretical ground for a profitable operation of the large-scale productive equipment doing away with any governmental subsidy or privilege.

P. Streeten said, "markets in the countries of the region (underdeveloped countries) can usually be created by import restrictions, and, where possible, export expansion"<sup>14)</sup> It would be relatively easy to take a policy of import restriction, but the enlargement of export would be so difficult that we would generally take a gloomy view of foreign market. In spite of the gloomy view, our dumping model presents a device of enlarging foreign market even under the disadvantageous conditions, high cost and crudeness in the quality of products. The industrialization is, of course, not the only process of economic development. But it is, as Hollis B. Chenery said, the main hope of most poor countries trying to increase their levels

12) A.O. Hirschman, *the Strategy of Economic Development*, Yale University Press, 1963, pp. 51~52.)

13) The indispensability of productive equipment will be valued at the so-called linkage effect of import substitution, etc.

14) P. Streeten, "Balanced versus Unbalanced Growth", in *the Leading Issues in Development Economy*, ed. by G.M. Meier, Oxford University Press. New York, 1964, p. 262.

of income.<sup>15)</sup>

The modern industrialization is generally based upon the large scale production, and then the size of market will raise a big issue. A.K. Cairncross said, "One of the principal obstacles to more rapid industrialization is the limited scale of operations in a manufacturing plant supplying only the domestic market of an underdeveloped country. It is precisely this limitation which international trade can remove"<sup>16)</sup>, Our dumping model will just give a device to remove the obstacles. But some might blame as follows; "By taking the dumping export, the monopolistic firm exploits the domestic consumers, and distribute charity to the foreigners, bringing about the disadvantageous condition of foreign trade". We could defend dumping against the blame, by saying that by accomplishing dumping export, the firm can supply goods to domestic consumers and reduce the average cost and the domestic price. If there were no dumping export, the firm could not exist and the domestic consumers could not get the product for consumption. By virtue of mass-production according to the dumping export and enlarged market, the firm can increase its output and employment, and reduce the average cost and the domestic price.

We must consider the dumping model in connection with the serious goal, economic development, by any means. If we can say that the process of economic modernization means the process of introduction of modern method of production, this sort of dumping will surely promote the economic development. In sequence of the process of economic development, the domestic market will be enlarged and the quality of product will be improved in accordance with technological progress. And now, it is natural that the monopolistic firm should be able to make both ends meet even without dumping.

This dumping model is also applicable to oligopolistic firm. They say that there is an intensive desire to prevent the loss from price war in the oligopoly, and that the price rigidity is an essential aspect of 'normal' oligopolistic price strategy. But, taking the procedure of dumping export, a discreet oligopolist may increase sales and profit without bringing any price war among competitive oligopolists in the domestic market. This oligopolistic dumping may increase not only firm's profit but also the social employment, because the oligopolistic firm will be able to increase output and sales and to reduce average cost.

15) H.B. Chenery, "The Role of Industrialization in Development Progress, in *The Economics of Underdevelopment*, ed. by A.N. Agarwala and S.P. Singh, Oxford University Press, New York, 1963. p.450.

16) A.K. Cairncross, *Contribution of Trade to Development*, in *The Leading Issues in Development Economics*, ed. by G.M. Meier, Oxford University Press, New York, 1964, p. 371.

Let us now think the effect of introduction of modern productive equipment by an oligopolist. Suppose that an oligopolist firm introduces a modern large-scale productive equipment to be substituted for an old-fashioned one, while other oligopolists are indifferent to the innovative behavior. The firm will have the existing kinky demand curve unchanged and a new average cost curve greatly changed. The new average cost curve may be higher at the small volume of output and lower at the large volume of output (optimum output) than the old one (depicted in Figure 3). And then, it seems that the firm has no means of taking profit or being in existence, because the average cost curve is above the two demand curves, domestic and foreign, all over its range. But our dumping model clearly shows the possibility of profit taking and firm's equilibrium even in that case. In the case, the firm, taking a procedure of dumping export, will be able to increase output and sales, reduce average cost and get profit, without any influence on domestic price. We can also appreciate the contribution of dumping export to the industrial modernization and to the increasing employment or economic development. It is also likely that the firm would cut the domestic price in order to expell the competitive oligopolists equipped with old-fashioned plant from the domestic market and to increase its market share. This may be the process of industrial modernization. It is known that, in the advanced countries, monopolies and oligopolies have been formed mostly through free competition. But, in the developing countries which have lately started to develop their industries, most key industries have been composed of monopoly or oligopoly from its beginning. For, in the developing countries, government will support monopolistic formation (or oligopolistic formation) of key industries as a policy to accomplish the development plan actively. Actually, the economic development means the introduction of modern method. And the advanced technology and the vast capital investment are indispensable to introduce the modern method of production, the large-scale production. The small size of domestic market will permit only a few firms with the large-scale productive equipment.

Hence, in order to prevent the waste from excessive competition, the government will institutionally support the firms to compose monopolistic (or oligopolistic) industries, making favourable conditions for the introduction of modern large scale equipment. Therefore, it is very important to study the economic behaviour of monopoly and oligopoly in accordance with the development of developing countries. Our dumping model will be a guide-line of monopolistic (or oligopolistic) behaviour. In general, dumping means the bargain sale of the accumulated goods or the bargain sale for capturing other's market. But our dumping is to achieve a satisfactory operation at full capacity and to get much more profit.

They say that there are many Korean firms which have had opportunity for dumping. The monopolists and the oligopolists who believe that the effects of dumping export is profitable, whether or not there are governmental subsidies and privileges, may have more truth on their side than those economists who have been willing to grant.

In addition to the theory mentioned above, our dumping model will be also applicable to the behaviour of monopolistic (or oligopolistic) firms of advanced countries.<sup>17)</sup>

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17) It is widely known that Japanese colour television sets had been exported to U.S.A. at the price which is about one third of Japanese domestic price.