Center for Latin American Development Studies

CUSTOMS UNION THEORY AND

FOREIGN DIRECT INVESTMENT

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The purpose of this paper is to study the cost and benefits that result from economic integration when there are foreign owned firms affected by the process. The analysis will be carried out using the traditional partial equilibrium presentation of the customs union theory. The main reason is that the characteristics of modern foreign <u>direct</u> investment call for a more explicit emphasis on the individual firm as the basic unit of analysis.

The welfare effects considered in our partial equilibrium analysis are based on Marshallian consumer and producer surplus. The use of the welfare measures entails certain well known difficulties associated with changes in the marginal utility of income. Secondly, adding together surpluses in different countries to obtain changes in joint welfare requires either the assumption that the welfare of each one counts equally for purposes of valuation of that compensations are available. Finally the results from the application of partial equilibrium concepts in several industries cannot simply be added together in order to obtain results for the whole economy under consideration. Throughout this study we assume that marginal utility of income is constant and that compensations among countries are available so the concept of consumer surplus can be used and added in the various countries. The conditions under which the results from a partial equilibrium analysis can be generalized to reflect the results for a whole economy in

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foreign firms in production require a more explicit discussion.

In Section I of this paper are analyzed the basic features of a partial equilibrium model designed to study the welfare effects of changes in the conditions under which foreign firms produce in a given country. That requires the consideration of three main peculiarities of FDI: (a) the existence of rents on exclusive factors of production or assets typically owned by foreign firms; (b) the "externalities" of FDI, such as its contribution of new technologies, entrepreneurial ability and tax revenues to the host country; and (c) the possibility that the total stock of capital in a country may change as a consequence of additional inflows or outflows of foreign capital. The latter is the principal factor that makes the transition from partial to general equilibrum results different from those already sufficiently analyzed in the standard economic theory.

Section II contains an inquiry into the welfare effects of the formation of a customs union in the presence of foreign firms. We consider first the situation of import substituting foreign firms, then that of the exporting firms, and finally the joint gains or losses for the host countries and the firms.

Section III focuses on the welfare effects of integration within mono-polistic markets; such markets predominate in manufactured goods produced by multinational corporations. The last section makes some general concluding remarks and suggests some policy implications.

1.- Firm and Industry Equilibriums, Rents and Externalities.

Rents on Foreign Assets.

Subsidiaries of foreign multinational corporations are typically characterized by the possesion of exclusive assets and superior entrepreneurial capacity on which their greater efficiency (lower costs compared to national firms) is based. It is indispensible then, to include the rents or quasi rents on those assets in a model designed to be used in the study of the behavior of foreign firms and their gains from foreign investment. Rents --as well as returns to all factors of production--obviously depend on the conditions of demand for the commodity with which they are related. Thus we need to consider the whole industry where foreign firms produce. To abbreviate we shall describe the situation diagramatically.

The line Da in Figure III-1 represents the __industry__ demand for commodity X in country A. Line S_a^f is the industry's domestic supply, showing the minimum price at which each quantity would be supplied, or the maximum quantity sold at each given price, given the technological knowledge available, the prices of inputs and other related commodities, and the supply functions of the factors of production relevant for the producers considered. Given S_a^f and Da, the industry competitive equilibrum for commodity X will involve a price Pa and production Qa.

The different output levels are in fact supplied by a number of individual firms. Thus, one could mark off on line PaE=OQa the amount supplied by each one. For example, at the initial price Pa, firm 1 may supply an output Oq. If the industry is competitive, then each firm will face a constant

price Pa for the commodity, so it will maximize its profits by setting a level of production at which its marginal costs equals that price (point e in the Figure). In general, the industry supply curve is not the sum of each firm's marginal costs function. As industry output contracts or expands the prices of the factors of production will be bid up or down if their supply is less than perfectly elastic. The marginal cost (MC) functions of each individual firm will shift upwards or downwards accordingly. In addition, technical conditions may change for individual firms but not for the industry: there may be non-pecuniary external economies or diseconomies. Each point on the industry supply function corresponds, then, to an equilibrium position of the individual firm and a set of possibly different factor prices. Thus, since our MC, and AC, are designed so as to represent the firm's output decision for different prices faced by it, it is indeed a "quasi-supply curve" defined as the "envelope" of MC and AC functions for each equilibrium position at various factor prices.[1]

The first point which can be stressed with the help of Fig. III-1 is that a long run competitive equilibrum in a given industry is perfectly compatible with positive rents or quasi-rents earned by some firms. This is what in the textbooks is defined as the return to "entrepreneurial capacity", which is indeed the return to specific factors owned by the firm.[2] The rents can be represented as the difference between the firm's

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[1] See Viner's (1931) classical analysis of these issues.

[2] See, for instance, the analysis of this aspect by Friedman, M. (1962) pp. 93-100 and 115-18. Rents on exclusive assets may not, however, be the only source of profits of foreign firms. An additional source and presumably quite important are monopolistic rents or profits. Monopoly profits are conceptually different from pure rents; they result from selling at a price above marginal cost (equal to marginal revenue). The case of monopoly will be studied separately in Section 3 below.

total income and its "contractual costs" which determine its output decision
during the period of time under consideration. If average or unit costs of
a given foreign firm are represented by the function AC_1 in Fig. III-1, the
quasi-rents earned by that firm when it sells its optimum output level at
price Pa will be equivalent to the area Pa e f Ca. [3] A reduction in the
price of X in Fig. III-1 from Pa to Pr (because a tariff on X is eliminated,
for example) would ceteris paribus, reduce the rents or returns to entre-
preneurial capacity of firm 1 from Pa e f Ca to Pre'f'Cr. That reduction,
or the difference between the two latter areas is equivalent to the area
to the left of the marginal cost function of firm 1 between the initial and
final price of X. [4] In this sense, we define the rents on the specific
factors with fixed supply owned by the foreign firm as equivalent to the
traditional concept of producer's surplus. [5]

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[3] For evidence about the significance of entrepreneurial capacity as
the most specific factor which explains the greater efficiency of
MNCs, see Stopford and Wells (1972).

[4] The area to the left of the MC function between Pa and Pr is identical
to the difference between the initial price (Pr) and the average or
unit cost at the initial level of production (q) times the latter output
level (the area Pa e f Ca). For a formal proof, see Bishop's Manuscript,
Book II, Chapter 3.

[5] Note also that what we have defined as rents or return to entrepreneurial
capacity of foreign firms are not necessarily equal to profits appearing
on balance sheets. Part of what appears as "profits" is usually the
alternative cost of capital used by the foreign firm. Within our def-
initions, this would be a contractual cost included in the MC function
which is relevant for its output decision. On the other hand, true
rents or quasi rents, defined as the residual between total revenue and
contractual costs, may in practice appear as costs in the firm's books.
That would be the case of royalties paid on patents or brand names owned
by the parent company of a foreign subsidiary. Also transfer pricing
is often used to increase costs and reduce profits in order to transfer
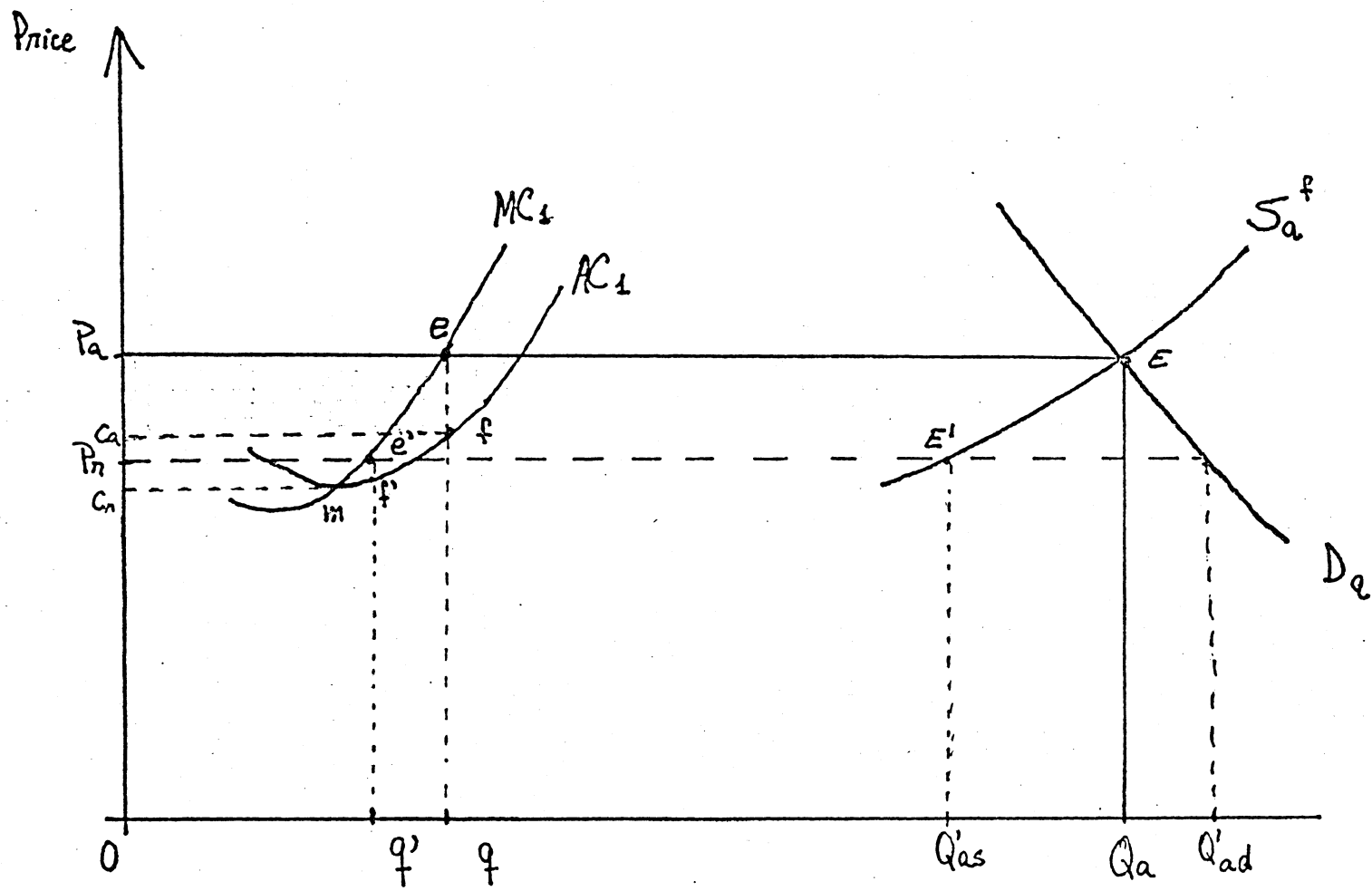true economic rents of a subsidiry to other affiliates.

Figure III-1

Under the assumptions spelled out so far, and supposing in addition

that: (a) there are no externalities, taxes or distortions of any kind in the

economy (all variable factors are paid the value of their marginal product);

and, (b) that the foreign capital stock within the country remains constant

but is reallocated to other industries, we can consider unambiguously the

welfare effects of change in foreign firms' production induced by a change

in the price of the commodity they sell. The marginal cost functions of

individual firms, as defined previously, may be added to generate an industry

supply function by foreign firms, such as Sa^f in Fig. III-1. Thus, reduction

of the price of X from Pa to Pr would involve an increase in consumer's surplus

equivalent to the area PrGEPa. Assuming, for simplicity, that there are no

national firms in this industry, the main counterpart of that gross gain

for the country is a fall in producer's surplus, or, indeed, in rents earned

by foreign firms on the specific package of assets that they own (which are

equivalent to the area PrE'EPa). This implies a redistribution of income

between producers and consumers, but, contrary to the case when national

firms are involved, in the case of foreign firms it is a transfer of income

from the foreign investors to the host country. The area under the industry

supply function, or under the relevant MC function of each firm, does not

imply either a welfare gain or loss for the host country nor the firms. It

simply reflects payments no longer made to variable factors used in this

industry which, under our assumptions, would be reallocated and paid to

produce other commodities. [6]

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[6]   Moreover, as mentioned above, contractions or expansions of the foreign
      firm's output within the framework we have defined may entail changes in
      prices or returns to non-specific factors of production, both foreign and
      national. Output variations may imply changes in the return of domestic

There are two additional aspects, however, that need to be considered in order to make a more realistic analysis of the welfare effects of changes in foreign firms' production. They are related to their "externalities" and the eventual effects of changes in the aggregate stock of foreign capital.

Externalities and Taxes.

A second characteristic feature associated with the presence of foreign firms is what in the literature on FDI is loosely defined as its "externalities". By this is meant all the investors' "contributions" to the host country's welfare aside from the inflow of capital (goods and funds) which enter in the balance of payment calculations. Those loosely defined "externalities" include three very different sets of foreign "contributions": (a) advanced technologies, new products and superior entrepreneurial capacity; (b) employment opportunities and training of local labor; and (c) taxes paid to the host countries.

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factors in inelastic supply, such as skilled labor. Recall that these factor price changes are already included in our definition of the relevant MC functions of the firm (their quasi-supply functions), which include all contractual costs.

The "true" economic externalities generated by foreign firms (to be differentiated from "apparent" FDI externalities below) should be properly represented as a difference between the market or private and the social costs of production. In terms of Fig. III-1, if the foreign firm 1 was training unskilled workers that were later being employed by national firms which did not pay for the cost of that training, then the reduction of the foreign firm's output from q to q' would not only imply fewer workers employed by that firm (which will be transferred to other industries), but will also imply fewer workers trained. Therefore, the area under the firm's MC function would not imply no net welfare gains or losses for the host country as in the case without externalities considered above. In the case considered here, part of that area should indeed reflect a loss from lower ... production by the foreign firm because fewer workers are trained. This loss can be represented by an area given by the difference between the private (firm's) MC and the lower social MC of production in the host country (not drawn in Figure III-1). That area should be subtracted from the gain in consumer's surplus in order to obtain the net welfare effect for the country.

Notice, however, that the training of local labor by foreign firms constitutes a true externality for the host country only if workers move out

of the foreign firm to work in national firms <u>and</u> neither the workers nor
the national firms "pay" for the training. In general, true economic
externalities result from "contributions" by foreign firms which "spread"
freely to the domestic economy or are not "paid" by the host country through
rents or other forms of compensations. [7]

Therefore, the first three types of "contributions" of FDI mentioned
at the outset are only "apparent" but not "true" economic externalities.
As Caves (1974), p. 176, has stated: "The host country does not benefit
directly because the foreign subsidiary is efficient, or brings to its
shore skilled entrepreneurship and productive knowledge. Rather its gain
depend on the spill-over that occur when the multinational corporation
cannot capture all quasi-rents due to its productive assets."

The mere employment of local labor constitutes a true economic "contribu-
tion" of FDI for the host country's welfare only to the extent that they would
not be employed otherwise. Very strong conditions must be assumed for that
to be the case and, in the case of FDI in manufactures, the "contribution"
of foreign firms to increase employment is relatively small compared to the
cost of generating it, given -partially- by the rents earned by the firms. [8]

7/   These distinctions have long since been recognized in the theoretical
      literature, since the pioneer work of MacDougall (1958). They are
      still not recognized, though, (or do not want to be recognized) in many
      applied studies, such as, for instance, May's (1970) report to the
      Council of the Americas.

8/   To the extent that rents are more closely associated with total revenues
      earned by foreign firms it is worth pointing out that, according to data
      from the 1957 and 1966 Census of US direct investment abroad, sales by
      manufacturing subsidiaries in Latin America increased by 300% compared
      to only 50% increase in employment by those subsidiaries between the
      dates just mentioned. See,May (1970), pp. 74.

Moreover, along with positive true externalities, FDI also entails negative externalities, which may outweigh the positive ones. Examples of negative externalities are the use of subsidized domestic factors of production and the tendency to transfer factors--specially skilled managers--out of the host countries.[9] It is also possible to include the political manipulation and influence of MNCs in the countries' domestic affairs as a negative externality. Thus, on balance, there are important reasons to believe that foreign firms do not generate very significant true net externalities.[10] Finally, whatever is the value of the true net externalities of FDI, it seems more reasonable to consider them jointly with taxes as a (positive or negative) revenue received by the host countries' economies, rather than as a differential between social and market costs, for reasons to be given in a moment.

Taxes paid by foreign firms in host countries are probably the most important and unambiguous contribution they make. We shall concentrate on corporate income taxes (or profit taxes, in general) and not on commodity taxes affecting more directly the levels of production. We shall define profit taxes as a general mechanism by which a host country may participate in the profits earned by foreign firms. The obligation to form joint ventures, in particular, would be one form of what we shall call a "profit" tax if local participation in the capital stock is obtained by paying less than the

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9/ See Floto (1974).

10/ For some interesting empirical evidence on this point, see Caves (1974).

present discounted value of the future flow of profits generated by the firm. [11]

Within this broad definition of profit taxes, it is reasonable to deal with true externalities generated by foreign firms jointly with taxes, for the particular reason that positive externalities for the host countries are usually not obtained automatically, but rather are "extracted" by the governments through a process of bargaining with the foreign investor very similar to, and interrelated with, that which goes on to determine profit taxes. True positive externalities are materialized through the requirement that firms should hire and train more local workers, have a higher share of "local content" (inputs whose local production will imply learning new processes and training more workers) and by reducing the payments of royalties and other fees imposed by foreign firms which transfer patented technologies. [12] A second reason to treat taxes and externalities jointly, is that the former should be measured net of the public services provided without direct payment to the foreign firms and of their use of subsidized local factors of production. These imply positive "externalities" for the firm, but negative "externalities" for the countries, which should be subtracted from the positive tax contributions made by the foreign investors.

11/ Obviously, there will be differences with respect to who gets the "tax" receipts when there are national private investors, rather than governments engaged in joint ventures.

12/ Notice, therefore, that we are not implying that FDI externalities are conceptually analogous to taxes in economic terms. They are different in several respects —for example, taxes are captured solely by the governments, while externalities may be captured by various economic agents. Taxes and positive FDI externalities, however, share the general common property of being an important form through which the host country benefits from FDI.

Changes in the Stock of Foreign Capital.

As mentioned in the introduction, the fact that changes in production by foreign owned firms may induce outflows or inflows of capital into the country whose welfare we are considering introduces an additional welfare effect which must be considered. Unfortunately, this isolated effect is much more difficult to represent in a partial equilibrium than in a general equilibrium framework as we did in CLADS Paper Nº 20. Obviously, it is not difficult to study the problem in a partial equilibrum framework when we are interested only in the particular industry under consideration; but the difficulties arise when we want those results to reflect the aggregate (general equilibrium) welfare effects of changes in production by foreign owned firms. In other words, the problem arises when one wants to define a partial equilibrium model representing a general equilibrium model. The conditions for making that kind of representations have been stated rigourous - ly long ago by Marshall and used, among others, by H.G. Johnson (1962) to deal, in particular, with the effects of a customs union in which we are interested here, but they implicitly assume a given fixed stock of capital. [13/]

If foreign capital remains within the host country, and is simply re- allocated to other industries, then the supply and demand functions of the commodity being studied (defined in the relevant way) will remain stable; i.e. they will not shift. Therefore, the gains and losses from integration can be measured using the traditional partial equilibrium concepts associated with the areas under the demand and cost functions.

[13/] For an heuristic discussion of the relations between partial and general equilibrium, see Joan Robinson (1941). For a diagramatic analysis, in relation to the concept of producer surplus that we have been using, see Mishan (1968).

If foreign capital leaves the country, reducing the total stock available, the demand and supply functions of the particular commodity being analyzed will shift, because--looking at the situation in a conventional general equilibrium diagram--the whole production possibility function of the host country will shift inward and consumption will also move to a lower indifference curve. Therefore, we would have one set of demand and supply functions in a particular industry for each level of foreign capital stock. Thus, the different industry equilibrium positions for each level of capital stock induced by each set of relative prices (with and without tariffs, for example) could be connected to give rise to the relevant supply and demand function": these would be a sort of "envelope" of the functions defined inclusive of capital stock changes, in the same way as the quasi-supply curve of a firm is an envelope of MC functions for different sets of factor prices.

The extent to which the supply and demand functions in a particular industry will shift as a consequence of foreign capital stock changes induced by relative commodity price changes due to economic integration is an empirical question. In a separate study, however,--within a general equilibrium framework using the theory of "immiserizating" growth--we showed that an exit (entry) of foreign capital induced by lower (higher) tariff protection per se may imply either reductions or increases in the host country's welfare or national income.[14] Thus, the direction of the shifts in an individual industry's supply and demand would be ambiguous, with positive and negative welfare effects canceling out. Hence, it does not seem unreasonable to pay

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[14] See, Tironi, "Economic Integration and Foreign Direct Investment Policies: The Andean Case," Ph.D. Dissertation, M.I.T., Cambridge, Mass., Chapter II or "The Theory of the Costs and Benefits from Foreign Investment and Economic Integration", CLADS Discussion Paper No. 20, Boston University. See also Bhagwati (1973), p. 53.

less attention to those shifts than to changes in the rents and consumer surplus reflected by the conventionally defined demand and supply functions.

Another consideration that leads to the same conclusion when one is interested in the joint welfare of two integrating countries, is that the foreign capital that leaves an industry in a country that starts importing a commodity produced in a partner country may move to the same industry in the latter in order to increase the exports of that commodity. Thus, the aggregate stock of foreign capital in the two countries may not change or change very little. This would imply that the supply functions of commodities produced by foreign firms in each country would be more elastic than otherwise, but that the region's joint demand for them would not shift as a consequence of capital stock changes. The industry-specific nature of FDI in manufactures implies that this is the most sensible assumption to make. Hence, we shall base our subsequent analysis on it as the main justification to concentrate relatively more on the welfare effects of changes in consumer surplus and rents earned by foreign firms than on the impact of variations in the pure capital stocks.

Under the assumptions we have spelled out in this section, the marginal cost functions of the individual foreign firms may be added to generate an industry supply of output by foreign firms, such as for example Sa^f in Fig. III-1. If there are also national firms in that industry, Sa^f will be a fraction of the total supply of the commodity in the country. If there are no competing national firms, the latter would determine all supply and the market price. This is the case on which we shall concentrate first, as represented in Fig. III-1.

Notice that this presentation allows us to consider the change in the number of firms producing in an industry. If the price falls below the minimum average or unit cost of production of firm 1 (point m in Fig. III-1) then that firm would leave the industry and possibly the country. But the consideration of this problem is no different from the one of changes in the stock of foreign capital. Under our definitions all these phenomena are reflected in the form (elasticity) of the industry supply curve, together with the implicit changes in factor prices and non-pecuniary external economies or diseconomies.

The crucial point to emphasize, in summary, is that the assumptions we have made assure us that the area below the industry supply function between two different levels of output (such as Qa and Q'as)

measure the <u>opportunity</u> costs of using domestic factors of production and of doing without foreign factors, in the case that the latter are not transferred within the country but leave it. On the other hand, the area to the left of the industry supply function between the corresponding prices (pa and Pr in Fig. III-1) will measure the "producers' surplus" obtained by foreign firms. We have defined the function in such a way that that area corresponds to the rents and quasi rents that are earned by the foreign firms on their exclusive assets--such as technolgies, patents, brand names, etc.--or, in general, on its superior entrepreneurial capacity.

Keeping these modifications of the traditional definitions of partial equilibrium supply and demand functions in mind, we can proceed to study the effects of economic integration in industries in which foreign firms participate.

2.- <u>Welfare Effects of Customs Unions in the Presence of Foreign Firms</u>.

In this section we will analyze the welfare effects of changes in foreign firms' production arising from the formation of a common market by using the traditional partial equilibrium theoretical approach and assumptions.[15] It must be recalled that we are not concerned with the question of whether FDI <u>in general</u> will increase or reduce a country's welfare but only the <u>conditions</u> under which a gain or loss will arise <u>as a consequence</u> of the formation of a common market. We first consider the case of an import substituting industry within the common market, then consider what is happening in the exporting industry (or country), and finally the joint welfare effects for host/partner countries and foreign companies.

a) <u>The Regional Import Substituting Industry: The Foreign Profit</u>

   <u>Diversion Effect</u>.

We start with this case because it follows the traditional presentation of the standard partial equilibrium analysis of the effects of customs unions. Thus, the welfare effects resulting from the presence of foreign firms in an industry can be "added" to the well known <u>trade</u> creation and diversion effects.

15/   These assumptions include mainly the absence of transport costs, decreasing returns or increasing costs of production, perfect mobility of domestic factors and no other distortions in the economies except for tariffs on third country imports. The validity of these assumptions may be questioned especially in the case of customs union among developing countries. But we shall not attempt to modify them, in order to keep the analysis simple and comparable with the traditional theory. We also assume the countrys' objectives to be the maximization of national income, without the consideration of non-economic objectives (such as preference for industrialization) or concern about political or economic "dependence" brough about by FDI. For a very illuminating analysis about the shortcomings of the former assumption in LDCs, see Bhagwati (1968).

The market equilibrium in an import substituting industry X within a given country (A), is represented in Figure III-2. For simplicity we shall assume throughout this section that there are only foreign firms producing in the industry. Their commodity supply funcction is represented by line Sa^f which reflects the industry's relevant marginal costs of production under the assumptions discussed above. Da is the country's demand for the commodity under consideration. Thus, if the CIF price of X imported from third countries is Pi and before integration the country was levying a tariff on X equal to Ta, the domestic price of output will be Pa (equal to $Pi(1+Ta)$). The level of domestic production will be set by the intersection of the industry's supply curve and the horizontal line PaJ reflecting the maximum price that domestic producers receive. That output before integration would be Qo, and since the total quantity demanded at that price is Do, then imports from the rest of the world amount to $Do-Qo$.

Let country A form a customs union with country B. B now sells goods in A at a lower price (Pr in Figure III-2) [16] so the foreign firms in A will reduce domestic production to Q_1 and imports (now from the common market) will increase to D_1-Q_1.

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[16] How that price is set within the common market, as well as the adjustments taking place in Country B are analyzed below.
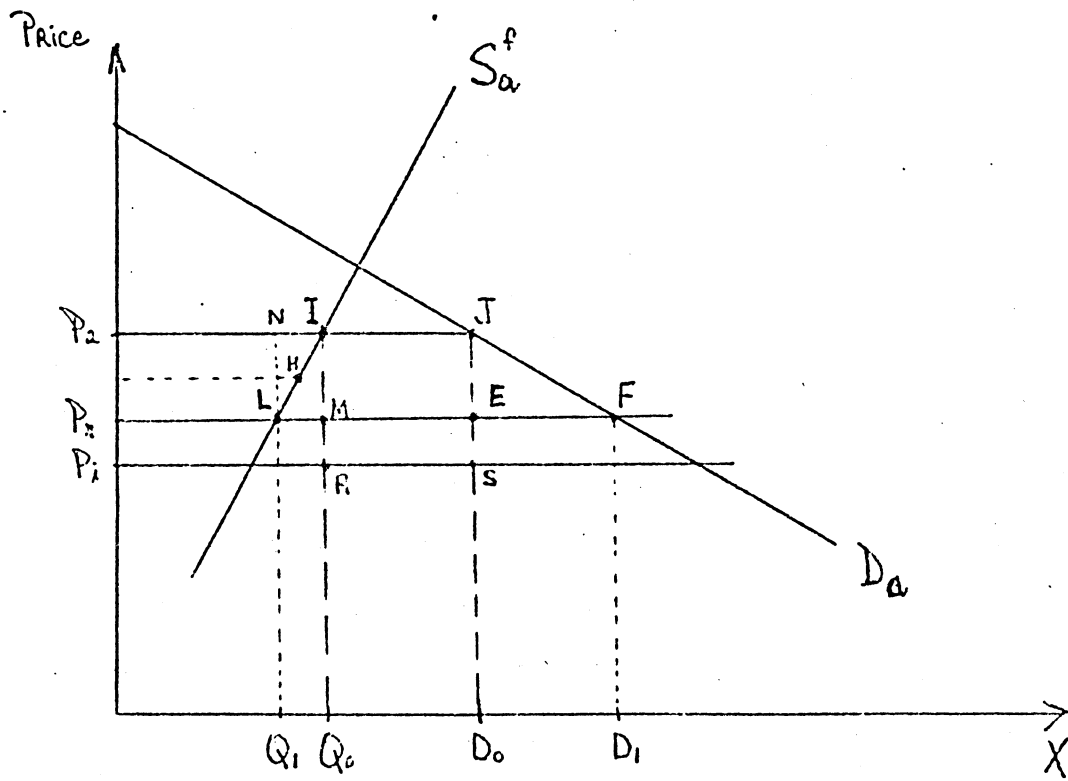
Figure III-2

The traditional gains and losses for a country forming a customs union arise from the opportunity to obtain some commodities cheaply from the partner countries; but as a counterpart, the country normally has to pay more for some commodities that may have been previously imported from third countries. These welfare gains and losses are measured by the classical trade creation and diversion effects. Since several authors interpret these concepts differently, it is necessary to state explicitly that we shall follow Harry Johnson's (1962) definitions of those concepts, which are more appropriate to the partial equilibrium model we are using.[17]

The reasoning applied to estimate the effects of forming a customs union _in the absence_ of foreign firms goes as follows. Country A's "gross" benefits from the opportunity to import cheaply from the partner country after regional tariffs are eliminated result from the increase in consumers' surplus. This is the area P_rFJP_a in figure III-2. But from that sum, we must subtract the tariff revenues no longer collected by the government (the area MEJI) and the loss in producers' surplus (P_rLIP_a). Those two areas are a mere transfer of income from the government and producers, respectively, to the consumers. Therefore, the net gain that is left for the country is the triangle EFJ (the consumption component of trade creation) plus the triangle LMI (the production component of trade creation) Those two areas should be compared with the trade diversion effect (the higher cost of importing from the common market the quantity formerly bought from the less expensive third countries, the area RSEM, in order to obtain the overall effect of integration.[18]

17/ For a discussion about those different interpretations see Krauss (1972).

18/ The trade diversion effect also has a consumption and production component which could be represented by the fall of consumption in the _other_ industry (Y) within country A as a consequence that the government no longer has that income to spend. See Johnson (1962), p.55.

In the presence of foreign firms, the gains and losses from the formation of a customs union are no longer restricted to the traditional trade creation and diversion effects. There will be <u>additional</u> gains or losses for the host country which arise from the change in rents earned by foreign subsidiaries, which implies a redistribution of income between them and the host countries. In the case of an importable commodity produced by foreign firms whose price falls after integration, the host country will gain from the reduction in the foreign company rents.[19] In fact, within our model, the country gains from the transfer or "transformation" of those rents into an increment in consumer's surplus and, hence, those gains correspond to the area PrLIPa in Fig. III-2.[20]

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[19] Recall that the possible additional gains or losses derived from changes in the foreign capital stocks per se, are already included in the definition of the demand and supply; for instance, the latter being more elastic than what it would be if capital stocks do not change.

[20] That area has two components: one is the "output variation" component given by the triangle LNI which measures the fall in profits on the quantity of the good that the foreign firms stop producing. They were generating revenues equivalent to the area Q_1NIQ_0, but had a cost of only Q_1LIQ_0, the difference being the profits earned by the foreign firms. The second component of the total rents transfered from the foreign firms to the host country is that arising from the lower price at which the former can sell the quantity that they will remain producing domestically after integration. That amounts to the area PrLNPa.

There are two additional peculiarities of FDI worth considering which will make our analysis more general and realistic. They are taxes on foreign profits and the (positive or negative) externalities that may be generated by FDI. For the sake of a simple exposition, we shall assume that only profits taxes are imposed and that externalities can be represented as an additional positive or negative "income" received by the country which can be added to the "tax bill".[21] Externalities and profits taxes, as different from commodity taxes, are assumed not to affect directly the levels of production determined by the firms.

If the host country participates in a fraction of the rents or profits earned by the firm, then it shares in the gains or reductions in those rents or profits. Thus, for example, if taxes on profits were 100% and there are no externalities, the situation would be analogous to having a national firm and there would be no gains to be attributed to the transfer of foreign profits to host country consumers. If foreign capital remains in the country and is reallocated, then the standard trade creation and diversion effects alone could capture all the welfare impac of integration.

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[21] The justifications to follow this procedure were discussed in the previous section. Recall that alternatively, both taxes and externalities could be introduced in the analysis as a difference between the private costs (those considered by the firm in taking its price and output decisions) and the "social" costs viewed by the host country. A knowledge of the base on which taxes are levied as well as the exact nature and the origin of the externalities are critical for determining how they should be introduced in the analysis. For a study of the effects of integration when there are differences between private and social costs, see Pou (1974).

To summarize, in the case of an industry dominated by foreign competitive firms producing the importable good domestically, there are additional gains for the importing country participating in the union, aside from the standard trade creation gains. These additional benefits can be called a "foreign profit diversion effect" which arises from the transfer of a fraction of the foreign company rents to the consumers, and should be considered together with the more traditional trade creation and diversion effects in order to obtain the net benefits for the host country.[22] The latter effects, by themselves, are not sufficient to determine the net benefits from forming a customs union in the presence of foreign firms. If there is no foreign capital used in any other industry in a country, except in the importable good industry, then the three effects considered so far will jointly determine completely the overall gains and losses from integration for that country. If in addition, how-ever, there are also foreign firms in that country which export to the protected market of the partner country as a consequence of the formation of a customs union, then an opposite foreign profit creation effect will arise. In this case, to estimate a country's overall gains or losses from the participation of all foreign firms in the common market in which the country becomes engaged, we should add the foreign profit diversion and creation effects to the standard trade effects.

22/   The term "profit", rather than "foreign investment" diversion seems more appropriate, because there could be no changes in foreign capital and even in output (Sa^f in Figure III-2 could be a vertical line) and there would still be (and even a larger) rent or profit transfer between foreign firms and host countries (a gain for the latter). Focusing on profit diversion and creation is also more consistent with Johnson's suggestion that rather than talk about trade diversion and creation it would be less confusing to talk of "terms of trade" creation (fall) and diversion (improvement). In fact, the profit diversion concept is equivalent to a real improvement in the "terms of investment" for the host country, or an implicit "net-of-foreign profits" terms of trade improvement on the goods produced by foreign firms, which, under our assumptions about capital mobility implies a gain for the countries.

To study the FP creation effect we must concentrate on the exporting industry. Since we have argued that the most reasonable assumption to make is that foreign capital is likely to be reallocated across integrating countries but within the same industry, we shall study the FP-creation effect in the same industry X on which we have been concentrating thus far, but looking at the situation in its exporting partner country (B).[23] The foreign capital that is no longer used in A because domestic production had fallen there, will be used in country B to increase production and exports to A. Thus, the joint welfare effects of those changes in the integrating countries can be studied without the need to take into consideration of the specific changes in capital stocks, because the aggregate stock in the two countries as a group will not necessarily change.

b) <u>Regional exporting industries: The Foreign Profit Creation Effect</u>

The foreign profit (FP) creation effect arises from increases in rents or profits of foreign firms that have a regional comparative advantage, so they expand production to start exporting (or increasing their initial exports) to the other partner countries within the protected common market.

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[23] Obviously if one is interested in the total welfare effects on an isolated country of forming a customs union in the presence of foreign firms, one should study the FP creation effect in <u>its</u> exporting industry e.g. industry Y in the case of country A.

That effect is illustrated in Figure III-3, which is identical to the one used in the last section, except that the changes in prices and output in country B are considered explicitly. Since this country becomes the regional exporter after the customs union is formed, by assumption its relevant industry's marginal costs of production must be lower than in country A. They are represented by line Sb^f in the figure and we suppose also that there are only foreign firms in the industry producing in country B. Assuming for simplicity that the demand function is the same in both countries, the initial price in country B(Pb) will be lower than that in A.

Assuming no transport costs, the (horizontal) sum of the supplies (i.e. the relevant marginal costs of production) in country B (Sb^f) and country A (Sa^f) determine the aggregate supply for the whole common market $S_r^f = Sb^f + Sa^f$. If producers behave competitively the regional price after the customs union is formed is determined at the level Pr where $S^f r$ intersects the region's demand function (Dr = Da + Db).

The increase in rents or profits which generates the FP-creation effect results from the rise in the relative price of the goods that foreign firms export to the common market. That price rise will tend to increase total output (in order to export), but also to reduce the quantity of the exportable good consumed domestically in the exporting

country.[24] Therefore, diagramatically, the FP-creation effect will be equivalent to the area P_bVYP_r in Fig. III-3. Assuming no taxes or externalities, that area measures the additional rents or profits obtained by foreign firms as a consequence of the formation of the customs union. Since part of that area implies a fall in the host country's consumer surplus, the FP-creation effect implies a _loss_ for the latter: a redistribution of income from the host country to the foreign investors whose rents (producer's surplus) increase.

If taxes are paid by the foreign firms, or if they generate positive externalities for the host country, then the loss for the latter will be smaller and may eventually imply even a gain.[25] The latter may occur if both, the taxes paid and the firms' exports are sufficiently high, as compared to domestic consumption, so that the _participation_ of the host country in the additional rents earned by the firms will exceed the loss of consumer's surplus. In this case, the host country's welfare depends

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[24] Recall that these changes in output levels and trade also have welfare effects derived from a better or worse _resource allocation,_ and they are dealt with in this model through the _trade_ creation and diversion effects. Here we are concentrating for the moment only on the _income distribution_ effects.

[25] However, the foreign regional exporting firms may _never_ end up worse off (even if profit taxes are close to 100%) because if profits were to fall they would not increase production in order to export. Losses may result only for import substituting foreign firms such as those analyzed in the last section.
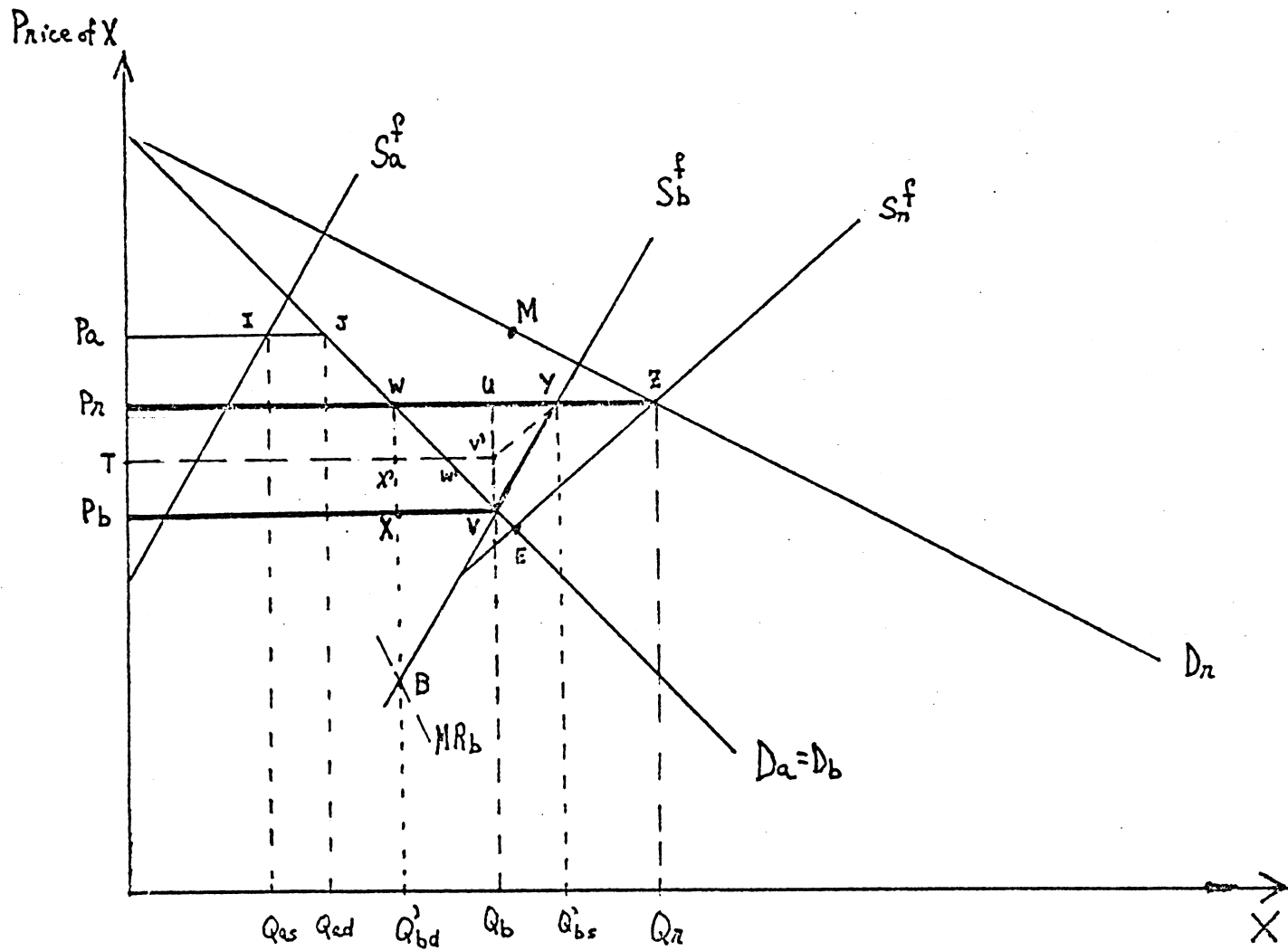
Figure III-3

on the <u>net</u> FP-creation effect. For a given tax rate, that <u>net</u> effect
is in turn, determined by the <u>size</u> of two critical components of FP-creation.

The FP-creation effect has two components: the additional profits
coming from the units of the commodity consumed in the host country after
integration (the area PbXWPr in Fig. III-3) and the additional profits
on the exports made to the common market (the area WX Y). We shall define
the former as the "consumption component" of the FP-creation effect, which
always entails a <u>welfare loss</u> for the exporting host country: under in-
creasing MC conditions, it implies a transfer of income (consumers'
surplus) from the country to the foreign investor.[25]

The "export component" of FP-creation implies a gain (and cannot
ever imply a loss) for the host country to the extent that the country
<u>participates</u> in the profits and rents earned by the foreign firms and/or
the extent to which there are positive externalities generated by exporting
to the common market.[26] Thus, given a positive tax rate, the net welfare

_____

[25] The crucial fact to consider is that the counterpart of that increase
in prices is a larger repatriation of rent or profits per unit of
the good produced, and not merely an internal transfer between con-
sumer and producers, as in the case of national firms, (plus the
probably smaller dead weight loss arising from the fall in consumption
in that country). Indeed, a good way to look at that profit creation
effect is to think of it as equivalent to imposing a tariff, the revenue
from which is not given back by the government to the domestic consumer,
but rather "thrown away".

[26] The presence of high transport costs on regional exports would diminish
the export component of profit creation (the only source of gain for
the host country) while it will not affect the consumption component
(the source of welfare losses).

effect (aside from trade specialization effects) of changes in foreign firm's production as a consequence of the formation of a customs union will depend on the size of each of those two components separately.[27]

Consider two extreme cases: If there are no net positive externalities and the exporting host country does not impose taxes on foreign firms (so the country does not share part of the export component of the FP-creation effect), it will necessarily lose from the participation of foreign firms in regional exports generated as a consequence of the formation óf the common market. The reason is that, on the one hand, it would obtain no benefits from the additional exports to the common market because the area under the MC function is defined to measure exactly the opportunity cost of domestic resources. On the other hand, it will lose from the consumption component of the FP-creation effect (the fall in consumer surplus transfered to the investor).

At the other extreme case, if the host country with foreign firms in its exporting industry places a 100% tax on the foreign firm's profit it will necessarily gain because the "consumption component" of the FP-creation effect would now represent merely an internal redistribution of income between the government and the consumers and the "export component" of FP-creation would imply a net gain for the host country, since it would capture all the profits from the sales to the common market (the area WXVY

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[27] There may be, however, a gain arising from a better allocation of domestic resources, but that effect would be captured by the trade creation effect and is not related directly to the presence of foreign firms.

in Fig. III-3). This result is not surprising since a 100% profit tax implies that the foreign owned firm would, in practice, be identical to a national firm; no additional rents and profits would be transfered abroad so the formation of the customs union would imply no international income distribution effects associated with FDI.

Within those two extremes cases of zero and 100% profit tax, there is a range of negative to (eventually) positive welfare effects derived from the participation of foreign firms in the host country's exports to the common market. In general, for a given gross FP-creation effect, the higher is the host country participation in the foreign companies' rents (for example through taxes and other means) the larger will be its gains (or smaller the losses) from the presence of foreign firms taking advantage of export opportunities. The reasons are quite evident at this stage: a higher tax rate will reduce the loss from the transfer of domestic consumers surplus to foreign investors and increasing the tax revenues due to the exports to the common market.

We have shown how critical is the size of the "consumption" and "export" components of FP-creation when there is a tax or other form in which the host country participates in the firm's benefits from the custom union. A simple visual inspection of Fig. III-3 shows that the sizes of those two components, as well as the whole FP-creation effect, are a function of the elasticities of supply and demand of the exported commodity.

For a given rise in the exportable good price and a given host country share
in the foreign firms rents (i.e. tax rate), the host country will gain
more (or lose less), the higher the elasticities of demand and supply of
that good. The common sense explantaion of this result is that higher
elasticities of those two functions imply a higher fraction of exports
in relation to domestic production for a given price increase; therefore,
they imply a higher export component of FP-creation (the only source of
gains for the host country if taxes are levied) in relation to the
consumption component of FP-creation (a necessary loss for the host country).

Looking at the problem from another angle, given the supply and
demand elasticities as well as the country's exportable good price increase,
it is possible to determine the minimum tax rate that would allow that
country to obtain a net benefit from regional exports by foreign firms.
This is the form in which we have chosen to present--in an appendix to this
chapter--the exact relation between the minimum profit tax rate and the
supply and demand elasticities.[28] In general, the lower these elasticities,

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[28] Assuming linear demand and supply functions the condition for the host country
to gain turns out to be that

$$t \; > \; \frac{1 - \frac{1}{2} N \cdot p}{1 + \frac{1}{2} E \cdot p}$$

where: t = profit tax rate
N = elasticity of domestic demand (defined positive)
E = elasticity of supply of the exportable good.
p = percentage rise in the price of the commodity

Recall that all the above discussion, and the elasticity condition just
mentioned, refer to a tax on pure rents or profits, which is assumed not to
affect output. The obvious short_coming of this simplifying assumption is
that it implies that if the host country wants to maximize its national
income, the optimal tax is 100%. If we assume that profit taxes also affect
output, or a product tax is levied instead, there would be some lower
optimal tax rate which would maximize the host country gain.

the higher will be the tax rate required on the exporting foreign firms
for the host country to avoid losing (or to eventually gain) from the
FP creation effect.

A sensitivity analysis using reasonable values of those elasticities
shows that the conditions necessary for FP-creation to imply a gain
for the host country are extremely strong (see Appendix Table 1).[29/] Fig. III-3
provides a diagramatic demonstration of a case in which the host country
would lose from exports by foreign firms to the protected common market
notwithstanding a 50% tax on their profits.[30/] In this case, the additional
net rents earned by foreign exporting firms will be equivalent to the area
PrYV'T, where UV' is half the segment UV. The tax also reduces the host
country loss from the FP-creation effect. Tax receipts will now amount
to the area PbVYV'T. Part of this tax revenue, however,--the area PbVW'T--
simply compensates for the consumer surplus loss which the country suffers.

[29/] For example, with an elasticity of demand of one and tax rate of 50%
of the foreign firms profits, a net gain for the host country from
the FP creation effect after a rise in 10% of the price of its export-
able good requires a supply elasticity of that good greater than
18. If it is only 4, under the same conditions, the tax rate must be
at least 80%.

[30/] That particular tax rate is chosen because the "fade-out" formula of
the Andean Foreign Investment Code, which forces to transform majority
foreign owned subsidiaries into 50/50 joint ventures, implies or is
equivalent (in present value terms) to a maximum profit tax rate of
50%. See Chapter VI, Section 3, of the author's doctoral dissertation
on "Economic and Foreign Direct Investment Policies: The Andean Case,"
submitted to the Department of Economics, M.I.T., Cambridge, Mass.,
August 1976.

Gross gains will, therefore, amount only to W'VYV', which corresponds to the host country net share in the "export component" of the FP-creation effect. This is the value that has to be compared with the loss in consumer surplus not compensated by the tax: the "consumption component" of the net FP-creation effect equivalent to the area PrWW'T.[31] Since in Fig. III-3 this latter area is larger than the former, that case implies an overall loss for the host country with foreign firms exporting good X.

To summarize, the key result form the analysis in this section is that --contrary to the popular notion that a country will always gain from the opportunity to expand exports due to the formation of a customs union-- we have shown that it is more likely to <u>lose</u> when the exporting firms are foreign owned. In addition, the crucial policy implication of that result, is that those loses will be smaller--or may eventually involve a gain--only if there are taxes or other means designed for the host country to participate in the additional rent earned by foreign firms exporting to the common market.

31/ With a 50% tax and linear demand and supply, the small triangle WX'W' --which measures part of the consumer surplus loss for the host country-- is identical to the triangle W'V'Y--which measures part of the tax revenue captured by the latter--so they will cancel each other. Hence, the condition for a net gain is, in this case, that half the rise in the price of the commodity times the level of consumption <u>after</u> integration (the shaded rectangle PrWX'T) be smaller than half the net foreign firms' profits on the <u>additional</u> output produced in order to export to the common market (the shaded triangle V'YV).

c)   <u>Distribution of costs and benefits of integration between host coun-</u>
<u>tries as a group and foreign firms.</u>

So far we have considered the welfare effects for each partner coun-
try considered separately. We have said, though, that the <u>overall</u> net
gains or losses from the presence of foreign firms in a customs union do
not come only from their activity as exporters of a good in a given country
(the FP-creation effect) but also as producers of that same good in the
importing country (the FP-diversion effect), as well as from the resource
allocation gains or losses (the <u>trade</u> creation and diversion effects). The
joint analysis of all these effects can be considered within our model by
looking now at the importing and exporting country together, under the
assumption that there are foreign firms only in the industry X on which
we have concentrated.

In general, the joint welfare effects will depend on: (a) the tradi-
tional conditions determining the <u>trade</u> creation and diversion effects; and
(b) on the variables we have shown to determine the FP-diversion and crea-
tion effect; in particular, the initial level of production by foreign firms
in the importing country. We shall first consider briefly this latter fac-
tor, which is likely to have great importance in the Andean Group.

(i) If all regional exports of X by country B replace imports of X by
country A formerly obtained more cheaply from third countries and there is
no domestic production of X in the importing country, then there will be
no gain for the latter from FP-diversion, there will be a loss from <u>trade</u>

diversion and probably also a loss for the exporting partner country from
a positive FP-creation effect.

(ii) If regional exports of X do substitute for domestic production of
X in country A but only production by national firms, then there
will still be no gain from FP-diversion, but there will be some from trade
creation.[32] Finally,

(iii) If, on the contrary, all regional exports of X by foreign firms
in country B substitute production by other foreign companies in the import-
ing partner country (A), then at least the latter will gain from a positive
FP-diversion effect plus the standard trade creation. Since FP-diversion in
A will compensate the probably negative FP-creation effect in the exporting
country (B), the joint losses for the group will be lower than in the other
cases and, if FP-diversion is sufficiently large, the overall welfare effect
of the customs union may be a net gain.

Assuming that there are foreign firms producing in the traded goods
industry in both countries, the costs and benefits from the countries' integra-
tion in the presence of foreign firms depends of the size of the FP-creation
and diversion effects. In turn, these effects are likely in practices to
depend on three main sets of variables: (a) the tariff levels before integra-
tion in the partner countries, which will be effecting the rents and volume
of domestic production by foreign firms as compared with imports from third
countries; (b) the elasticity of supply of the traded good within the com-

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[32] Trade creation and diversion in country B could also be studied in its
exporting industry X, so Fig. III-3 may indeed represent all the welfare
effects of integration in a two sector model under the presence of
foreign firms. For a longer discussion about this point see the con-
cluding remarks below.

mom market; and (c) the size of the market (demand) of the exporting
compared to the importing country. The importance of these variables can
be readily seen in Fig. III-3; hence we shall describe in words only a
few extreme cases.

The initial tariff level set by country A on the commodity (X) which
it ends up importing from the common market determine the extent to which
the price of X will fall after integration, as well as the level of imports
to be expected initially from third countries. In terms of the situation
represented in Fig. III-3, the tariff on X determines the length of the
segments Pa-Pr and IJ, respectively. The lower that initial tariff,
ceteris paribus, the more the countries will lose (or the less they will
gain) from the participation of foreign firms in the common market because
FP-diversion will be smaller and trade diversion higher. The opposite will
be true if that tariff were higher.

On the other hand, ceteris paribus, the lower the elasticity of supply
of the traded commodity within the common market, the more likely it is for
both host countries to end up worse off. In the extreme case of a perfectly
inelastic supply in both countries, the price of X in the importing country
(A) is likely to fall only slightly (or remain the same). Hence, there
would be a smaller (or no) gain from either foreign profit diversion or
trade creation effects in that country (while it may be losing from trade
diversion if it was initially importing some output from lower cost third
countries). In the exporting country, however, an inelastic supply of X
makes the welfare-decreasing foreign profit creation effect greater or

more likely. This results from the fact that the price charged by the
foreign exporting firms goes up while exports to the regional market
increase only at the expense of lower consumption in the exporting coun-
try. In other words, the export component of FP-creation effect will tend
to be smaller compared to its consumption component. In those conditions,
foreign profits will most likely exceed the loss in consumer surplus in
the exporting country, unless the taxes on profits are relatively high
and regional exports increase because domestic demands falls considerably
(i.e. unless demand elasticity is very high).[33/]

Notice that the main factor which can contribute to increase the elasticity
of supply of X in country B--and, thus, increase its gains from integration--
would be the entrance of new firms into B's industry. The common sense
explanation of this result is clear: the competition generated by that
entrance of new firms will tend to reduce the rents of the foreign firms
initially supplying X in B.

Finally, the size of the common market compared to the exporting
country's domestic market is also important. The gross gains from the
host's sharing in the profit creation effect will be larger, compared to
the consumer surplus loss in the domestic market, the larger is the part-
ner country's market. In other words, the area VVY will become
larger compared to the area PrTX'W in Figure III-3 .

33/ See exact conditions in Appendix to this paper, and the simulations
in the table at the end of it. For the exporting host country to gain
with a zero supply elasticity of exportables (rather than 6) and a
price increase of 20%, it requires either an 80% profit tax rate
(rather than 50%) or an elasticity of demand of 5 (rather than 2).

3. Concluding remarks

In the analysis carried out so far we have concentrated on the
welfare effects of the presence of foreign firms in one industry (X),
in which there is regional trade, and assuming there is no FDI in
other industries (commodity Y, in our two sector model). If there are
foreign firms in the latter, the same analysis must be repeated for
industry Y. [34/]

The crucial policy implication of all this analysis is that, if
there are reasons to expect that the overall FP-creation effect
is likely to be larger the FP-diversion effect of a customs union,
the host countries are not likely to gain from its establishment,
except if they implement policies to share part of the additional
rents earned by the foreign firms exporting to the common market.

Notice, however, that the mere fact that _foreign_ firms would
become more concentrated in regional exports does not necessarily
imply less gains for the host countries as a group (implicitly deri-
ved from FP-creation). The reason is that those exports could be
benefiting the same countries as importers (from FP-diversion by
reducing the foreign investors' rents and profits by even more than

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34/   The _trade_ creation and diversion effects in each country, however,
      should _not_ be estimated also in the other industry. If all cost
      and demand functions are correctly derived from a general equili-
      brium model that would imply double counting, because in equilibrium
      the value of imports should equal that of exports.

the increase of those rents in each countries' export industries.
But the reciprocal statement will always be true: if foreign firms
are less concentrated in regional exports, that is, if more of the
regional exports are made by national firms--given some presence of
foreign firms in the countries--the formation of the common market
will be more likely to increase their welfare because it will have
a positive FP-diversion effect with a lower FP-creation effect.

The main reasons that are likely to make the FP-diversion
effect smaller than FP-creation in the small-sized and semi-industria-
lized Andean countries is the structure of the common external tariff
and the monopolistic power of foreign firms. The effect of the
former has been already pointed out: if the industries in which FDI
is concentrated are granted a relatively higher external tariff pro-
tection, the counterpart of FP-creation is not likely to be as much
FP-diversion as trade diversion. Hence, this will be one of the main
hypotheses that we will attempt to verify in the empirical part of
this study in order to assess the necessity of a FDI policy seeking
to participate in the FP creation effect of the customs union.

The second practical condition likely to make the FP-creation
effect larger than the FP diversion effect is the presence of mono-
polistic rather than competitive foreign firms. In the standard cus-
toms union theory we have been using so far, prices were determined
by the intersection of the regional demand and supply in competitive

markets. This is likely to be a very unrealistic assumption for in-
dustries dominated by subsidiaries of modern multinational corpora-
tions. Monopoly power is typically another source of higher profits
for foreign firms and closely related with the rents they obtain
from their exclusively owned assets, such as for example the brand
names of differentiated products.

Under the same costs and demand conditions in a given indus-
try, the FP-creation and diversion effect of integration under mono-
poly would be different from those under competition. To start with,
the initial price/output equilibrium in the industry would be differ-
ent. A monopoly in country B would have been fixing a higher
price of X (Pr rather than Pa, in Fig. III-3) and would have had
a lower level of production given by the point at which his marginal
cost of production equals his marginal revenue (point B in the dia-
gram). Hence, he would have been earning higher profits (equival-
ent to the area PbXUPr). The initial industry equilibrium in coun-
try A, however, would have been in the same position as before, because
the monopoly would have been forced to behave as a competitive
industry due to the initial competition from third country imports.

Now let this industry be integrated by eliminating tariffs
between the partner countries and let one of the monopolistic firms
eliminate its rival (or let producers collude--as they would auto-
matically if they are subsidiaries of the same multinational corporation).

In this case, in terms of Figure III-3, the common market monopoly equilibrium will be at point E where the regional marginal revenue intersect the monopolist's marginal cost function. The price charged to consumers will be given at point M on the region's demand Dr. Hence, in this case integration will imply practically no gains for the host countries and higher profits for the foreign firms: there would be no profit diversion and a higher profit creation effect.

The possibility of that outcome depends on each industry's market structure and conduct which, in turn, depends mainly on cost conditions and barriers to entry, the level of the external tariff and the institutional relation among firms. Rather than complicating the model suggested here by allowing for different shapes of cost and demand functions or different forms of host country taxation, it seems more relevant to concentrate on the welfare effects of different market structures which may result as a consequence of economic integration. The analysis in this paper suggests that the "Industrial Economics" of foreign direct investment and integration is certainly one of the topics that needs to be studied more intensively in the future.

APPENDIX

VARIABLES AFFECTING HOST-COUNTRY GAINS OR LOSSES

FROM THE FOREIGN PROFIT CREATION EFFECT

Following the discussion in the text (pp. 28 to 33), what we need to measure

is the difference between the areas $(F + H) - I$ in the following figure:
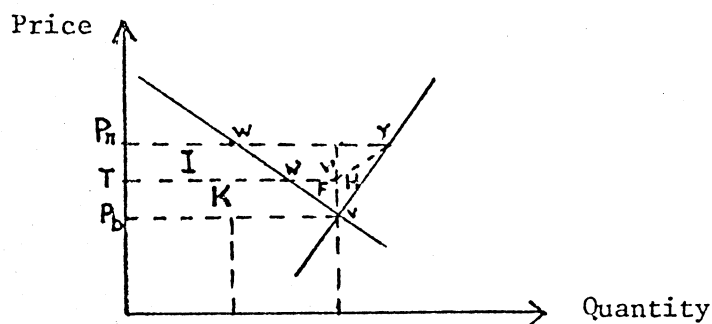
I = Host country net loss in consumer's surplus when taxes are
Pbt per unit (equivalent to the area PrWW'T in figure III-3
in the text and also reproduced here).

F = Host country Net gain from profit taxes on the __initial__ level
of production

H = Host country Gain from profits on additional production
exported to country A (Areas F + H are equal to the area
W'VYV' analyzed in the text).

1. Assuming that demand and supply functions are linear, the Net Gain from

__initial__ production is $G' = F - I$, where

$$G' = F - I = (T + K) - (I + K) \tag{1}$$

$$= (t \, \Delta P \, Q_0) - (\Delta P \, Q_1 + \frac{1}{2} \Delta P \; \Delta Q)$$

$$\doteq (t \, \Delta P \, Q_0) - (\Delta P \, Q_1 + \frac{1}{2} \Delta P \, Q_0 - \frac{1}{2} \Delta P \, Q_1)$$

$$= t \, \Delta P \, Q_0 - \frac{1}{2} \Delta P Q_1 - \frac{1}{2} \Delta P Q_0$$

$$G' = \Delta P Q_0 \left(t - \frac{1}{2} - \frac{1}{2} \frac{Q_1}{Q_0} \right) = \Delta P Q_0 \left(t - 1 + \frac{1}{2} \frac{\Delta Q}{Q_0} \right) \tag{2}$$

Since $N = \dfrac{\Delta Q}{Q} \Big/ \dfrac{\Delta P}{P}$, then

$$G' = \Delta P . Q_0 \left(t - 1 + \frac{1}{2} \, N \, \frac{\Delta P}{P} \right) \tag{3}$$

Therefore, $G' > 0$ implies

$$t - 1 + \frac{1}{2} N \, \frac{\Delta P}{P} > 0$$

$$t > 1 - \frac{1}{2} \, N \, \frac{\Delta P}{P} \tag{4}$$

2. The gains from the participation on foreign profit creation on additional production (G'') will be always positive and is directly proportional to the elasticity of supply

$$G'' = t \, \frac{1}{2} \, \Delta P \, \Delta Q''$$

where $\Delta Q''$ is given by that elasticity of supply: $\varepsilon = \dfrac{\Delta Q}{Q} \Big/ \dfrac{\Delta P}{P}$

$$G'' = t \, \frac{1}{2} \, \Delta P \, Q_0 \, \frac{\Delta P}{P} \, \varepsilon = \Delta P \, Q_0 \left[t \, \frac{1}{2} \, \varepsilon \, \frac{\Delta P}{P} \right] \tag{5}$$

This expression can be added directly to equation (3) giving, the total net gains for the host (exporting) country.

$$G = G' + G'' = \Delta P \, Q_0 \left[t - 1 + (N + t \, \varepsilon) \, \frac{1}{2} \, \frac{\Delta P}{P} \right]$$

Therefore $G > 0$ implies

$$t \left(1 + \frac{1}{2} \varepsilon\ p\right) + \left(\frac{1}{2} pN - 1\right) > 0$$

where $p = \frac{\Delta P}{P}$. Thus,

$$t > \left(1 - \frac{1}{2} N\cdot p\right) \Big/ \left(1 + \frac{1}{2} \varepsilon p\right) \qquad (6)$$

Alternatively, a net gain for the exporting host country can be represented as requiring a minimum elasticity of exportables:

$$\varepsilon > 2(1 - t)/t\ p - N/t \qquad (6')$$

The following table shows that the elasticity conditions for a host country to gain from the FP-creation effect, even with reasonably high profit taxes, are very strong.

APPENDIX TABLE 1

Elasticity conditions for a zero host country loss from FP – creation effect.

$$\varepsilon = 2(1 - t) \ / \ tp - N/t$$

Case No.	t	p	N	ε
1	.3	.1	1	43
2	.5	.1	1	18
3	.8	.1	1	4
4	.3	.1	2	40
5	.5	.1	2	16
6	.8	.1	2	25
7	.3	.2	2	17
8	.5	.2	2	6
9	.8	.2	2	0
10	.5	.2	5	0

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