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This paper contains preliminary findings from research work still in progress and should not be quoted withou prior approval of the author.

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INTRA-FIRM SERVICE TRADE BY THE MULTINATIONAL ENTERPRISE

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Abstract

It is widely held that Multinational Enterprises (MNE) arise as a consequence of the existence of knowledge-based firm-specific assets such as superior technology or management know-how. These assets are much like public goods with the firm in that they can be costlessly supplied to additional plants, thus leading to the efficiency of multi-plant (MNE) production. Foreign direct investment (FDI) then consists of supplying the services of the assets to foreign operations and repatriated earnings are payments for these services. FDI and trade in producer services become conceptually very similar. These notions are formalized in a simple model of the MNE, and the implications for the gains from foreign investment, the role of public policy, and our balance-of-payments accounts are analyzed.

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1. Introduction

The vast literature on the multinational enterprise (MNE) arrives at a consensus on few issues. There is however some, but not unanimous, support for John Dunning's (1977, 1981) "eclectic" view as to the necessary conditions under which a firm will undertake foreign direct investment (FDI). Under this view, sometimes referred to as the OLI (ownership, location, internalization) paradigm, three conditions are necessary. First, the firm must have an ownership advantage like proprietary rights to a product or a production process that allows it to compete successfully with foreign companies. Second, the foreign country must have a location advantage for production, such as tariff/transport cost barriers to imports or low factor prices, that lead the MNE to produce in that market rather than service it by exports. Third, there must be an internalization advantage that leads the MNE to buy or create a foreign subsidiary rather than license production/distribution to a foreign firm.

There is some dissent to this view, most notably by Rugman (e.g., 1981, 1985, 1986) who focuses on internalization as the key element and Casson (1986). Casson, for example, suggests that the ownership advantage in particular is relevant to the theory of the firm (as in what makes a successful firm) but not to the theory of the MNE in particular. At the great risk of becoming involved in this debate, I find Dunning's eclectic approach to be useful in the context of international trade theory while at the same time I can understand Rugman's focus on internalization from the point of view of international business theory. The international trade economist is

interested in the two questions of whether a domestic product is provided to a foreign market and whether it is provided by exports or by foreign production. The trade economist is less interested in the question of whether the foreign production is by a subsidiary or by a licensee of the home firm. The former two question relate to the O (ownership) and L (location) of the Dunning paradigm while the latter is the I (internalization) that completes the triad.

The purpose of this paper is to consider intra-firm trade in the services of knowledged-based assets by the MNE. Accordingly, the paper will focus on the ownership advantage possessed by a MNE and analyze how this ownership advantage implicitly gives rise to the exports of services by the home firm to the foreign subidiary or licensee. The essence of the arguments relating to trade in serivces has little to do with whether foreign production is internalized by FDI or conducted arms-length through a licensee. Thus issues relating to internalization, while undeniably important in some contexts, will not receive attention. I will consistently refer to FDI in the formal analysis but the arguments and conclusions will apply equally well to licensing and franchising situations.

A widely held view is that the ownership advantages of MNEs that give rise to FDI are knowledged-based, firm-specific assets (or capital). The reason that these assets are more likely to give rise to FDI than physical-capital assets lies in the unique transferability and "public goods" nature of the former. Knowledged-based capital can first of all be transferred easily back and forth across space at low cost. An engineer or manager can visit many separate production facilities at relatively low cost. Further, knowledge often has a jointness or "public-goods" characteristic in

that it can be supplied to additional production facilities at very low cost. Blueprints (a knowledge-based asset) for new products or production processes can be provided to additional plants without reducing the value of the blueprints to the initial plants. The blueprints are thus a joint input into all plants. Assets based on physical capital such as machinery tend to not have this property. That is, physical capital usually cannot yield a flow of services in one location without reducing its productivity in other locations.

Because of this jointness characteristic, knowledge-based assets give rise to multi-plant economies of scale. This is defined to be a situation in which a two-plant firm can produce for less cost than can two identical but independently-owned plants. In the latter case, there will be a costly duplication of the knowledge-based assets. The existence of these assets and their joint-production characteristic thus leads to the creation of cost-efficient multi-plant firms, or MNEs. Assets based on physical capital do not have the jointness characteristic and thus do not contribute to the efficiency of multi-plant production (their are a few exceptions based on indivisibilities, such as a mainframe computer that services more than one plant). In fact, economies of scale that are correlated with physical capital intensity may imply a tendency away from multi-plant (MNE) production in that it is cost efficient to serve all markets from one central production facility.

When a MNE opens a branch plant or commissions a licensee in a foreign country, this investment can be thought of as an act of transferring the services of the knowledged-based asset to the foreign country. There may be no identifiable movement of factors across the border. In this view of the MNE, repatriated profits are partly or possibly entirely payments to the home

firm for the services yielded by the MNEs assets. While there may be a monopoly power elements as well, the service flow should be identified as such in understanding the benefits derived by the host country from the MNE. I should emphasize here that these service flows have nothing to do in principle with the nature of the MNEs final product. Managerial, technical, and marketing services flow to branch plants regardless of whether or not that branch plant is producing a manufactured good or a service. It is a conceptual mistake to assume that a manufacturing MNE is not involved in trade in services just as it is a mistake to assume that the entire output of a service-producing foreign subsidiary constitutes trade in services. In neither case does the value of the subsidiaries' sales tell us anything about the extent of intra-firm service trade.

2. The Value of Service Imports Versus Repatriated Profits

Two goods (X and Y) are produced from a single factor, labour (L), which is in inelastic supply at any point in time ($\bar{L} = L_x + L_y$) and internationally immobile. Y is produced with constant returns by a competitive industry and units are chosen such that $Y = L_y$. Y is used as the numeraire so that the wage rate in terms of Y is equal to one. To begin producing X, a firm must incur the once-and-for-all sunk costs of F (firm-specific cost) and G (plant-specific cost) in terms of Y (or L). Additional plants may be opened for the cost of G only. F is thus intended to represent the knowledged-based capital that is a joint-input or "public good" within the firm. F could be thought of as an R & D investment necessary to design a product or a production process. Once the design is produced, it can be costlessly incorporated into additional plants. This leads to multi-plant

economies of scale in that a two-plant firm only incurs F once, while two one-plant firms must each incur F. The fact that the services of F can be costlessly extended to additional plants does not, of course, imply that these services are of no value to the additional plants.

Throughout the paper, we will use a simple static representation of this problem, although dynamic considerations are a key determinant of equilibrium market structure (Buckley and Casson (1981), Smith (1986), Horstmann and Markusen (1987)). This representation is given in Figure 1, where $\bar{Y}GF\bar{X}$ is the country's production frontier. $\bar{Y}$ is the maximum feasible production of Y. In order to begin production of X, a firm must invest the fixed costs G (given by the distance $\bar{Y}G$ in Figure 1) and F (given by the distance GF in Figure 1). After investing the fixed costs, X can be produced at a constant marginal cost in terms of Y which gives us the linear segment $F\bar{X}$ in Figure 1. This linear segment has slope m if m is the marginal cost of X in terms of Y.

Because of the fixed costs, average cost exceeds marginal cost and hence the price of X in terms of Y must exceed the marginal cost m if the firm is to make non-negative profits. The average cost of producing X in terms of Y is given by the simple formula

$$(1) \qquad AC_X = L_X/X = (\bar{L} - L_y)/X = (\bar{Y} - Y)/X$$

Consider point A in Figure 1. The average cost of producing this amount of X is, from (1), simply the slope of the line passing through $\bar{Y}$ and A. Average cost is everywhere decreasing in X. The non-negative profits constraint implies that the price ratio at a point like A must be at least as steep as the average-cost line $\bar{Y}A$.

Figure 1 shows an equilibrium in which the firm producing X is making positive profits. Equilibrium production is at A and the equilibrium price ratio is p. A community indifference curve is shown tangent to p at A. The point I in Figure 1 given total income or GNP in terms of good Y. But total labour income in terms of Y is simply $L_x + L_y = L = \bar{Y}$ in Figure 1. Total income (IO) thus divides into profits ($I\bar{Y}$) plus labour income ($\bar{Y}O$). The budget line for labour is the line through $\bar{Y}$ with slope p. The indifference curve tangent at B in Figure 1 thus represents the consumption bundle and welfare level of labour, with the difference between B and A being consumption out of profits. The division of total output between labour income and profits is just a distributional issue in the closed economy, but becomes an issue of GDP (the value of domestic output) versus GNP (the income of domestic citizens) if a foreign-owned MNE is producing X and repatriating profits.

Now suppose that the X industry in the country is monopolized by a foreign MNE which has incurred the firm-specific fixed-cost F in its home market. The MNE transfers the services of its firm-specific asset but (as is often the case emprically) transfers no physical factors of production or financial capital. The latter are purchased by the MNE (labour is the only factor here) in the host-country market. In this case the relevant production frontier in the host country (h) becomes $\bar{Y}G\bar{X}'$ as shown in Figure 2. From a technical (as opposed to a cost) point of view, it is as if the host country has been given the technology or other knowledge embodied in F for free. The production frontier of the host country shifts out, enabling more final output to be produced from the same resource endowment. The value of the "service import" can thus be defined as F, the amount of Y or of labour services which,

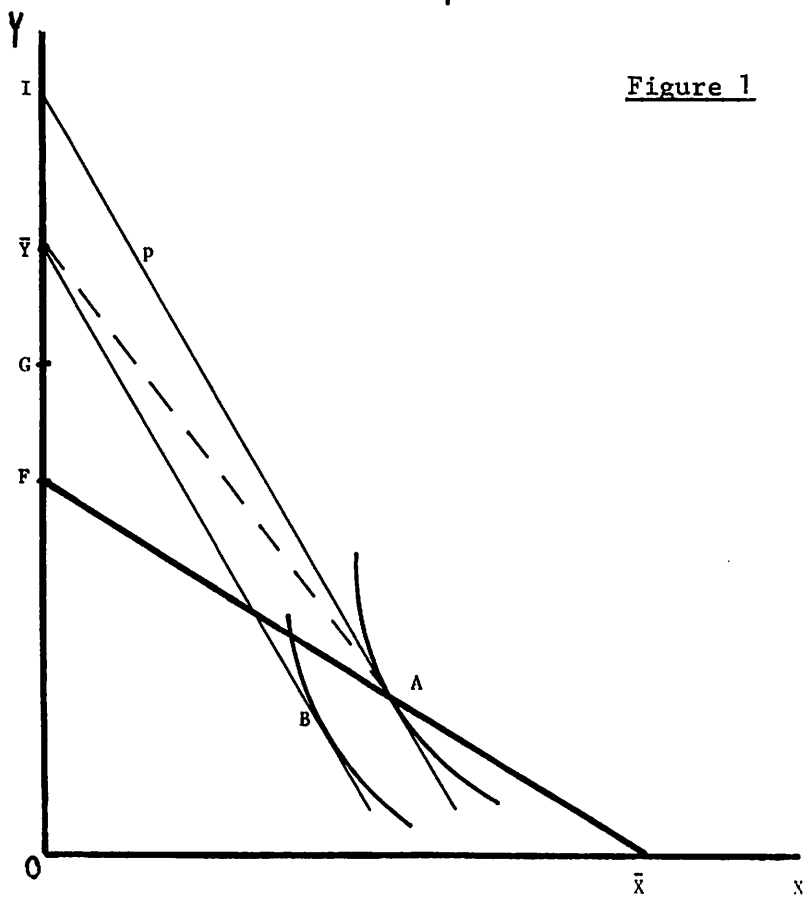


Figure 1

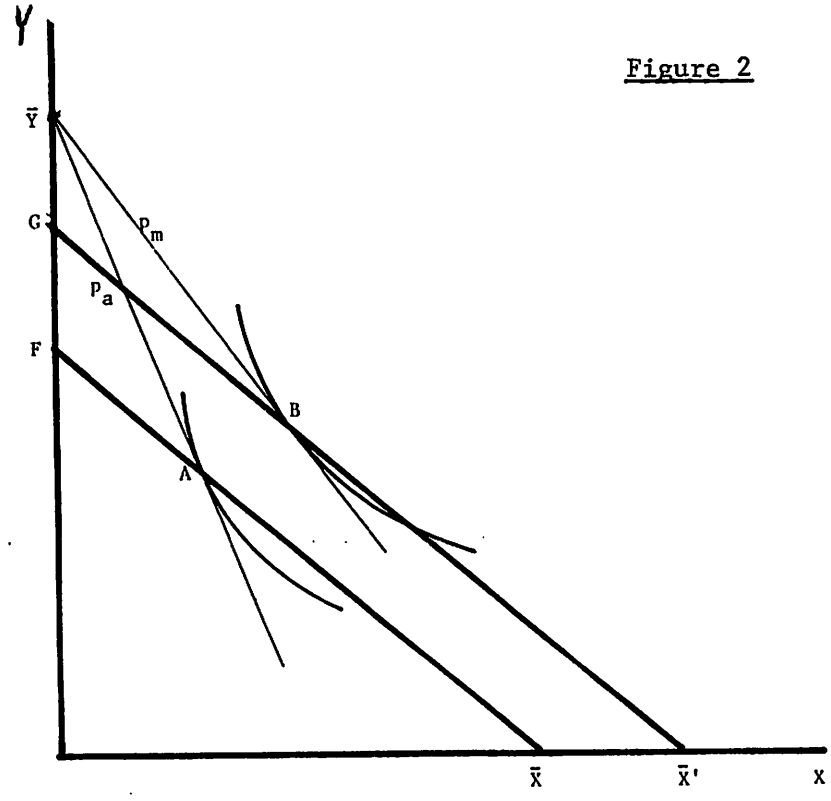


Figure 2

if given free to h, supports the same production frontier as is obtained by hosting the MNE.

This "technical improvement" from obtaining the services of F is clearly of potential benefit to the host country. But since h must pay for this technology, further analysis is required. It turns out that the equilibrium payment made for F can vary widely from the cost of F itself. Three cases are considered in Figures 2, 3, and 4.

Figure 2 considers one extreme case in which the host country obtains F for free. Suppose arbitrarily that the autarky equilibrium in h is at A with price ratio p_a. The home producer of X is thus just managing to break even. Alternatively, the threat of entry by other home country producers of X forces the existing firm to price down to average cost as in the contestable-markets model. Now suppose that the host country market is instead captured by a foreign MNE who similarily is forced to price at average cost by threat of entry by other foreign MNEs. The new equilibrium will be at a point like B in Figure 2, where B is on $G\bar{X}'$ and is characterized by a tangency between the indifference curve through B and the average cost line $\bar{Y}B$. Average cost line $\bar{Y}B$ is the also the MNE equilibrium price ratio p_m.

In this case there are no profits made or repatriated so that B is the consumption bundle of the host country. Recall that this is possible since, due to the joint-input nature of F, it is costless for the MNE to extend the services of F to country h, and so potential or actual competition could indeed drive the price charged for F down to zero. The MNE equilibrium at B with price ratio p_m is exactly the same as if the home firm (and potential rivals) all receive the knowledge embodied in F for free. Figure 2 thus depicts the best of all possible worlds. The host country receives services

worth F and pays nothing for them. The balance-of-payments accounts show no payments for FDI (or for anything else since there is no trade in X or Y in Figure 2) yet imports of services have clearly taken place and the country has clearly benefitted from them.

Figure 3 shows a situation in which the host country pay a price (the MNE repatriates a sum) such that it receives no net benefit from the MNE. As in the case of Figure 2, the autarky equilibrium is at A with price ratio p_a. The domestic producer of X makes no profits so that all income is labour income. Assume also that this is the monopoly equilibrium price and quantity for the domestic producer rather than an average-cost-pricing equilibrium due to threat of entry (i.e., the domestic market is just large enough for the domestic producer to break even at the monopoly price). Now suppose instead that one MNE supplies the host country market and is not threatened by entry. The MNE has the same marginal cost by assumption, and will face the same demand curve for X as was faced by the domestic producer of X since each faces the aggregate demand curve of the L labourers. Thus the MNE will charge the same price as was charged by the domestic producer.

The MNE equilibrium will then be at a point like B in Figure 3 at price ratio $p_a = p_m$. Point I in that diagram gives the total value of production in terms of Y (GDP), while point $\bar{Y}$ gives the income of host-country citizens (GNP). The consumption bundle of domestics continues to be at point A in Figure 3, and profits are repatriated in the amount $I\bar{Y}$ by the MNE. In this case, the host country is indifferent to the presence of the MNE, being neither better off nor worse off relative to autarky. The value of profits repatriated are equal to F plus any consumer surplus that would have been created by giving h an amount F (i.e., $I\bar{Y}$ in Figure 3 will typically exceed F

(GF in Figure 3), but this is not very relevant). The balance-of-payments accounts will show a positive value of payments for FDI, with these payments being exactly equal to the benefits received by the host country. The host country pays for the services with X or Y or perhaps both. We could observe the host exporting both X and Y and importing neither commodity. The home country has a trade account (as opposed to current account) deficit.

Figure 4 shows a case in which the host country is actually made worse off by the MNE displacing a domestic producer. Suppose that the autarky equilibrium is at A, and that the domestic producer is forced to price down to average cost due to threat of entry. That is, at A marginal revenue is less than marginal cost. Now assume instead that a single monopoly MNE produces X. The MNE has the same marginal cost and faces the same demand curve as that of the domestic producer, but will choose to price at marginal revenue equals marginal cost by virtue of its monopoly position. The MNE price ratio p_m thus exceeds the autarky price ratio p_a as shown in Figure 4. This can be an equilibrium in that any domestic firm may calculate (conjecture) that, should it enter in competition with the MNE, price will be driven down below average cost and the entrant will earn negative profits. Such a case can be easily constructed by making the fixed cost F sufficiently large relative to the size of the economy.

In Figure 4, the MNE thus produces at B with price ratio p_m. Total production in terms of Y is I and host country income is again given by $\bar{Y}$. The host-country budget line is given by a line with slope p_m through Y, and a host-country consumption bundle is drawn at C in Figure 4. Due to the price increase, the host country is worse off at the MNE equilibrium than at the autarky equilibrium A. Due to its technical superiority, the MNE is able to

Figure 3

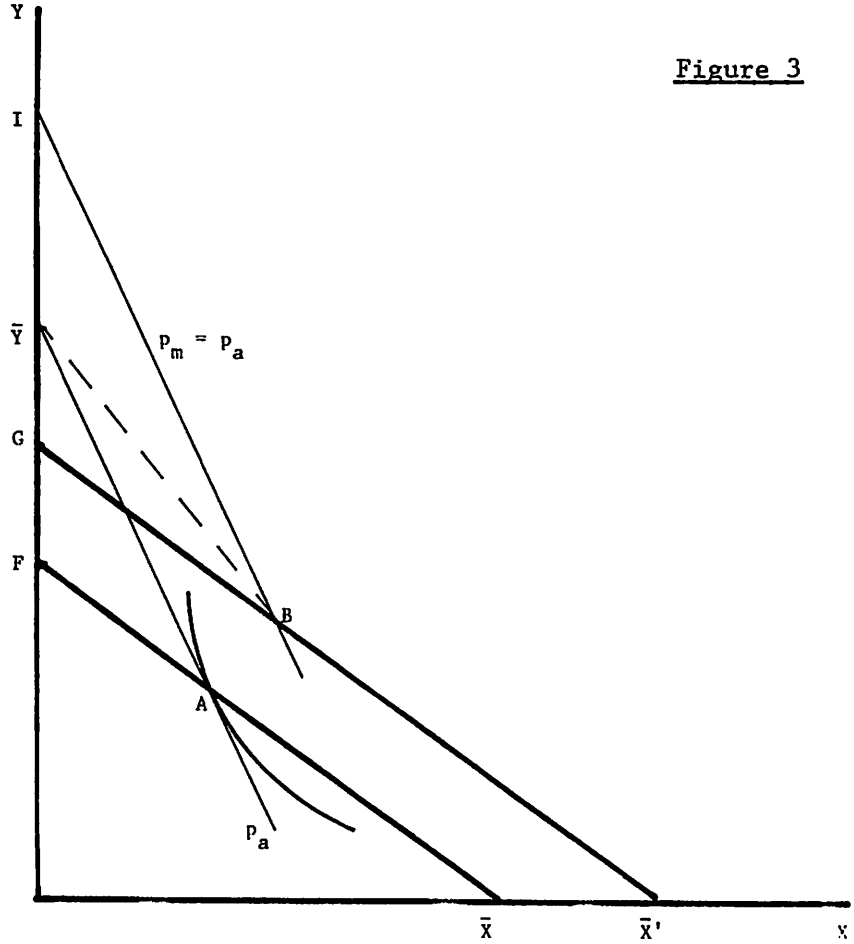
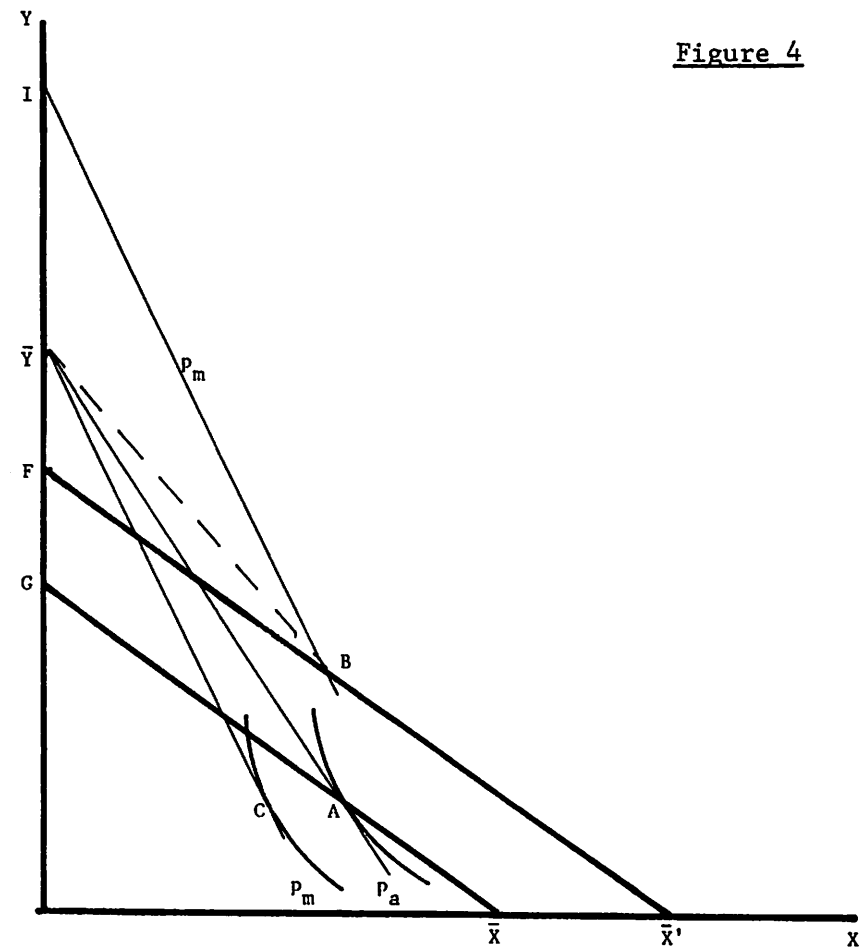


Figure 4



establish a monopoly position that allows it to extract profits that exceed the contribution of the services of F to the host country. The balance-of-payments accounts show positive payments for FDI, but these payments now overestimate the value of the services provided by the MNE. The balance-of-payments accounts are similar to the case of Figure 3: a home (host) country deficit (surplus) in the trade account.

This last situation is a little fanciful. It assumes that the autarky situation can be more competitive than the open economy situation. Especially for smaller economies, the idea that we could have a contestable-markets situation resulting in average-cost pricing by a single efficient firm in autarky would receive little support. Alternatively, if such an autarky situation could exist, then the same conditions that lead to contestability in the closed economy should lead to contestability and average-cost pricing in the open economy. But then we are back to Figure 2 with the host country getting F for free.

The question of the "probability" of an outcome is of course quite different from the question of the "possibility" of an outcome. The situations shown in Figures 2, 3, and 4 are all possible and can be rigorously derived for some set of cost, demand, and behavioral assumptions. All are pure cases, and none of them may be very probable. The last in particular is generated by a set of assumptions that does not seem appealing. But all of the three cases are useful for a key point that I wish to make in this paper. This is that (A) the MNE is an exporter of the services of its knowledged-based assets, but (B) the payments made by the host country (profits repatriated by the MNE) can differ widely from the "value" of the services received. At one extreme, competition forces the payment down to the

marginal cost of providing the service, which is zero by the joint-input assumption (Figure 2). At the other extreme, the market power of the MNE results in the host country paying more for the service than its value, such that the host country is worse off with the MNE (Figure 4). A more formal analysis of the gains from MNE production is the subject of the next section.

3. Welfare Analysis for Host Country

Consider the equilibrium in which the host country has no involvement with the home country versus an equilbrium in which an MNE produces X in the host country and repatriates whatever profits it earns. Let "m" refer to equilibrium quantities when the MNE is producing with a branch plant and let "a" refer the the host country autarky outputs and prices. The revealed preference criterion for the host country to be better off with the MNE in autarky is

$$(2) \quad C_{ym} + p_m C_{xm} \geq C_{ya} + p_m C_{xa}$$

where C_{ij} is consumption of the ith good (i = x,y) in the jth equilibrium (j = a,m) in the host country. In autarky, we have the market clearing conditions that supply equals demand for each good.

$$(3) \quad C_{ya} = X_a, \; C_{xa} = X_a$$

At the MNE equilibrium, we must have the balance-of-payments constraint that the value of consumption equals the value of production minus repatriated profits at MNE prices. This constraint is given by

$$(4) \quad C_{ym} + p_m C_{xm} = Y_m + p_m X_m - \pi$$

Where π is the profits repatriated by the MNE. Substituting (3) and (4) into (2), the condition for gains becomes

$$(5) \quad Y_m + p_m X_m - \pi \geq Y_a + p_m X_a .$$

Now subtract the total labour endowment $L = L_{xm} + L_{ym} = L_{xa} + L_{ya}$ from both sides of (5).

(6) $(Y_m - L_{ym}) + (p_m X_m - L_{xm}) - \pi \geq (Y_a - L_{ya}) + (p_m X_a - L_{xa})$

The assumption of competition in Y implies that profits in Y are zero; i.e., $(Y_m - L_{ym}) = (Y_a - L_{ya}) = 0$, so (6) reduces to

(7) $(p_m X_m - L_{xm}) - \pi \geq (p_m X_a - L_{xa})$.

Assume as in the previous section that the host country government imposes no taxes. In this case the left-hand side of (7) is always zero. That is, the MNE repatriates all profits so that $(p_m X_m - L_{xm}) = \pi$. The sufficent condition for gains in (7) thus reduces to

(8) $(p_m X_a - L_{xa}) \leq 0$

A sufficient condition for the free-market solution to improve on autarky is thus that the profit from producing the autarky outputs at MNE equilibrium prices is negative. This result is illustrated in Figure 5. The production frontier is $\bar{Y}G\bar{F}\bar{X}$ for the autarky case while the MNE can produce along $\bar{Y}G\bar{X}'$ since it does not have to incur F. Suppose that the MNE equilibrium price ratio is p_m. Then the host country's budget line is $\bar{Y}N$. The geometric equilvalent in Figure 5 of the algebraic criterion in (8) is whether or not the autarky equilibrium along $\bar{Y}G\bar{F}\bar{X}$ is to the left (point A) or right (point A') of N. In the former case, the production revenue at p_m is less than the cost ($\bar{Y}$) and thus profits from producing A at p_m are negative. The strict inequality holds in (8) and we see that N is revealed preferred to A in Figure 5. the opposite comparison applies to A', in which case autarky is superior to the MNE equilibrium.

One condition that is sufficent for (8) to hold is that competition

among MNEs drives price to average cost. If both X and Y are normal in consumption, then p_m must be less than p_a. The reason is that if a domestic firm charged p_m in autarky, it would have to be producing more X (and therefore less Y) than at the MNE equilibrium in view of the host-country firm's higher fixed cost if the latter is to earn non-negative profits. But at this production configuration of more X and less Y, the demand price will be below p_m and thus a price of p_m or higher cannot be an equilibrium price in autarky. Equivalently, the autarky output of X will be less than the amount that must be produced to break even at price p_m. This in turn implies that (8) is negative. Average-cost pricing by the MNE is sufficient for the host country to gain. This is a formalization of the intuition from Figures 2, 3, and 4 that the host country is less likely to gain when the MNE extracts positive monopoly profits.

4. Welfare Analysis for the Home Country

Inward flows of FDI generally seem to generate more concern on the part of policy makers than outward FDI. Occasionally, the latter is seen in the negative light of "exporting jobs", but more often it is a matter of benign neglect.

The algebra of equations (2) through (7) of the previous section can be used here by simply changing the sign of π and writing it as π_r for profits repatriated. The home-country version of (7) then becomes

$$(9) \qquad (p_m X_m - L_{xm}) + \pi_r \geq (p_m X_a - L_{xa})$$

This can be rewritten as

$$(10) \qquad (p_m - L_{xm}/X_m)X_m + \pi_r - (p_m - L_{xa}/X_a)X_a \geq 0$$

But L_{ij}/X_j is just the average cost of producing X, AC_{ij}. (10) can then

be written as

$$(11) \qquad (p_m - AC_{xm})X_m + \pi_r - (p_m - AC_{xa})X_a \geq 0$$

In our simple model, AC_{ij} is decreasing in X as we noted in connection with Figure 1. Thus if $X_m > X_a$, then $AC_{xm} < AC_{xa}$. But the latter in turn implies that $(p_m - AC_{xm}) > (p_m - AC_{xa})$, so that $X_m > X_a$ is sufficient for (11) to be positive (π_r must be non-negative by assumption). The expansion of domestic production of commodity X is a sufficient condition for the home country to be better off by allowing its domestic producer to export or invest abroad. Consider exporting first, with reference to Figure 6. Assume that the autarky equilibrium is at A. Since the price line must cut the production frontier $F\bar{X}$ at A if profits are to be non-negative, an expansion in the production of X must be beneficial. If the X producer is allowed to export, we will have an equilibrium at a point like B in Figure 6, with consumption at a point like C.

The intuition behind this result is a familiar one from public finance theory. Because of the fixed cost of producing X, the price charged must exceed the marginal cost of production (p - MC) > 0. Price indicates the value of an additional unit of the good in consumption while MC indicates the cost of the resources needed to produce an additional unit. With price in excess of marginal cost, additional units of X produced generate a surplus of (p - MC)dX. Exports of X thus generate a gain for the domestic economy independently of employment arguments.

Now suppose instead that the MNE wishes to export only the services of its firm-specific asset F, producing X abroad. Domestic production of X will almost certainly be less than at the exporting equilibrium just derived and could possibly be less than in autarky (i.e., the MNE could repatriate some of

Figure 5

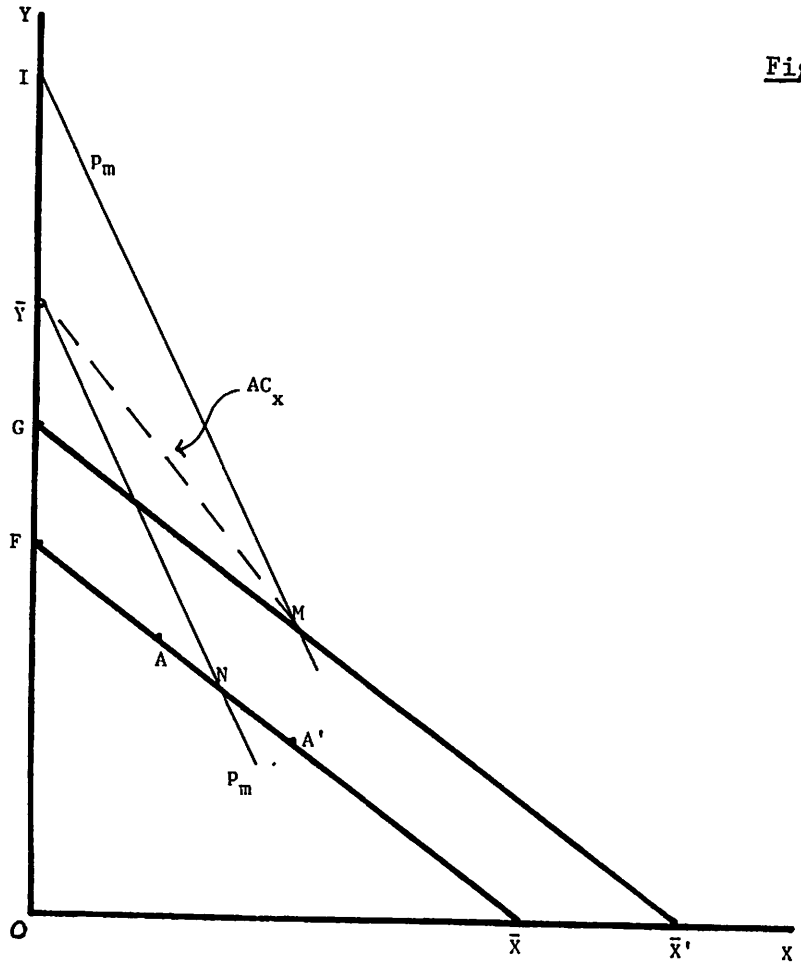
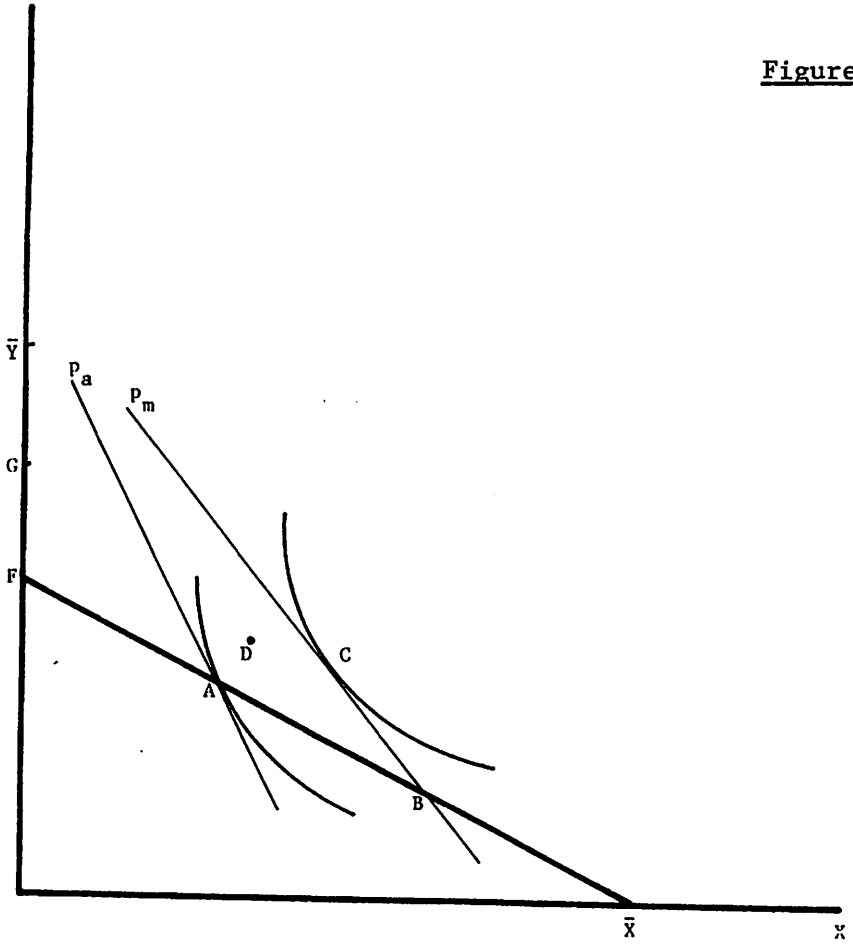


Figure 6



the foreign production to serve the domestic market). Could the home country be worse off as a consequence of the outward FDI? The answer is no. Let π_m denote the MNE's profits on its <u>domestic</u> production at the free-trade equilibrium (whether exporting, producing both home and abroad, or even serving the domestic market by imports from its foreign plant (π_m is zero in the last case)). Let π_{am} denote the MNE's profits on its domestic production at autarky, but evaluated at free trade prices. These are more formally

$$(12) \qquad \pi_m \equiv (p_m - AC_{xm})X_m \,, \qquad \pi_{am} \equiv (p_m - AC_{xa})X_a$$

Equation (11) can then be written as

$$(13) \qquad (\pi_m + \pi_r) - \pi_{am} \geq 0$$

The first two terms in (13) are the MNE's total profits at the free-trade equilbrium. The first is profits on domestic production (which may include export sales) and the second is profits repartriated from the foreign subsidiary. If the MNE is a rational maximizer, it will not undertake exporting or FDI unless the sum of these two exceed π_{am} (i.e., profits from domestic plus foreign operations are revealed preferred to autarky profits). Thus the home country is better off with foreign operations than in autarky. If A is the autarky equilibrium in Figure 6, then the consumption bundle with FDI must be at a point like D in Figure 6.

It cannot be established in general that if the MNE chooses FDI over exporting or vice versa that the country as a whole is better off relative to the option of international transaction that was not chosen. That is, it is not clear what the relationship will be between points D (FDI) and C (exporting) in Figure 6. However, under reasonable assumptions, the MNE does make the socially efficient choice. Let the subscript m denote the FDI option

and let e denote the exporting option. The simple autarky market-clearing condition in (3) must be replaced by the balance-of-payments condition

(14) $C_{ye} + p_e C_{xe} = Y_e + p_e X_e$

This can also be written as

(15) $C_{ye} + p_m C_{xe} + (p_e - p_m)C_{xe} = Y_e + p_m X_e + (p_e - p_m)X_e$ or

$C_{ye} + p_m C_{xe} = Y_e + p_m X_e + (p_e - p_m)(X_e - C_{xe})$

The same proceedure as used in (5) and (6) can then be used to get the equivalent of (7)

(16) $Y_m + p_m X_m + \pi_r \geq Y_e + p_m X_e + (p_e - p_m)(X_e - C_e)$ or

(17) $(\pi_m + \pi_r) - \pi_{em} \geq (p_e - p_m)(X_e - C_e)$

Rationality on the part of the MNE will again imply that $(\pi_m + \pi_r) \geq \pi_{em}$. But we now have the additional term $(p_e - p_m)(X_e - C_e)$, which is a terms-of-trade effect. Given that $(\pi_m + \pi_r) > \pi_{em}$, the inequality in (17) will hold and the country will be better off with FDI than exporting if this last term is negative. Since $(X_e - C_e) > 0$ by the assumption that X is exported, the term will be negative if $(p_e - p_m) < 0$. That is, a sufficient but not necessary condition for the home country to be better off with outward FDI than with exports is that the export price p_e is less than the FDI price p_m.

One factor which leads to $p_e < p_m$ is a foreign tariff that forces down the price received when exporting but not when serving that market by a foreign branch plant. Transport costs would have a similar effect. These factors are reasonably common and are indeed two important forces that motivate FDI in the first place. More rigorously, assume that to engage in

FDI, the home firm must make a fixed-cost investment G in a foreign plant. If the marginal costs at home and abroad are the same and constant as we have assumed, then the home firm will only invest abroad if the price it can charge (p_m) exceeds the net price it receives from exporting (p_e). Thus the observation of FDI implies that ($p_e - p_m$) < 0, and the inequality in (17) holds. If the home firm chooses FDI, then the home country must be better off than if the firm was forced to choose exporting which is in turn preferred to autarky. Point D in Figure 6 would have to lie above point C.

5. Summary and Policy Implications

The first purpose of this paper was to construct a model to show how the activities of MNEs are closely related to trade in producer services. The large empirical literature on MNEs repeatedly finds that MNEs are associated with the existence of knowledged-based, firm-specific assets. These include technical expertise gained through R & D, managerial expertise gained through experience over time, and product reputation and identification gained through advertising expenditures. I then observed that knowledged-based (as opposed to physical-capital based) assets have the property that they can be transferred to additional production facilities at a very low marginal cost, perhaps zero.

This jointness or public-goods property gives rise to the existence of multi-plant economies of scale in which one two-plant firm has a cost advantage over two independently-owned plants. MNEs then tend to arise as an equilibrium production structure. The international transactions then carried out by the MNE are to provide the services of the firm-specific assets to the foreign plants. Engineering, management, marketing, and financial services

cross the border in intra-firm service trade.

The paper develops a formal model in which the firm-specific asset is a pure joint-input or "public good" within the firm. Technical and managerial knowledge can be provided to additional plants at zero marginal cost. This property of the technology allows even two identical countries to have potential bi-lateral gains from MNE investment. Technical efficency is captured by having markets served by multi-plant firms (MNEs) who spread the fixed-costs of the knowledged-based assets over many plants.

The problem arises in that while the MNE is technically efficient, it often possesses considerable market power. A host country enjoys the benefits of the MNE's technical and managerial expertise without having to make its own investment in these assets, but the market power of the MNE implies that the latter may extract considerable monopoly rent as payment for the services of its assets.

Through a discussion of several possible cases, we then showed that the relationship between the services exported by the MNE and the payments it repatriates are complex. At one extreme, the host country could find its payment driven down to zero (the marginal cost of providing the service), while at the other, the payment may so exceed the value of the service that the host country is worse off. We showed that competition among MNEs and potential rivals is likely to guarantee that the host country is a gainer. Equivalently, corporate income taxes imposed by the host country capture for the latter a share of any monopoly rents that are generated, and hence also make gains from inward FDI very likely.

Countries were also shown to gain from outward FDI. While production jobs may be lost to other sectors by choosing FDI over exporting, the

profit-maximization rules for the MNE were shown to be consistent with the social objective of welfare maximization given certain assumptions about the domestic and foreign cost structure.

These results can be used to make some observations on the construction and interpretation of our standard balance-of-payments accounting practices. In many if not most cases, the economic content of international transactions are roughly the same in the categories of (A) trade in producer services, (B) payments for FDI, and (C) royalties and license fees. These items are recorded separately in the BOP accounts. I thus suggest that the BOP service-sector accounts are constructed more on the basis on the mode of international transactions than on the basis on the economic content of the transaction. This is no doubt useful for some purposes, but the current accounting practice does not serve the purpose of identifying very clearly exactly what types of economic services are in fact being traded.

Comments were also made about the interpretation of trade (merchandise) account deficits/surpluses that often seem to concern policy makers. In the two-country framework of this paper, a home firm exporting to the other country produces a situation of zero net trade balance. But if the firm switches to branch plant production, the trade account goes into deficit for the home country. It was shown in the paper that this deficit has no negative normative implications and indeed is associated with a welfare improvement for the home country under reasonable assumptions.

REFERENCES

Buckley, P.J. and M. Casson (1981), "The Optimal Timing of Foreign Direct Investment, Economic Journal 91, 75-82.

Casson, Mark (1986), "General Theories of the Multinational Enterprise" A Critical Examination", Chapter 2 of Mark Casson, The Firm and the Market: Studies on Transactions Cost and the Strategy of the Firm (London, Basil Blackwell and Cambridge: MIT Press).

Casson, Mark (1979), Alternatives to the Multinational Enterprise (London: Macmillan).

Caves, Richard E. (1982), Multinational Enterprise and Economic Analysis (Cambridge: Cambridge University Press).

Dunning, John H. (1977), "Trade, Location of Economic Activity and MNE: A Search for an Eclectic Approach", in Ohlin, Hesselborn, and Wijkman (editors), The International Allocation of Economic Activity (London: Macmillan).

Dunning, John H. (1981), International Production and the Multinational Enterprise (London: George Allen and Unwin).

Horstmann, Ignatius and James R. Markusen (1987), "Strategic Investments and the Development of Multinationals", International Economic Review 28, 109-121.

Markusen, James R. (1984), "Multinationals, Multi-Plant Economies, and the Gains from Trade", Journal of International Economics 16, 205-226; reprinted in Jagdish Bhagwati (ed.), International Trade: Selected Readings, second edition (Cambridge: MIT Press).

Rugman, Alan M. (1986), "New Theories of the Multinational Enterprise: An Assessment of Internalization Theory", Bulletin of Economic Research.

Rugman, Alan M. (1981), Inside the Multinationals: The Economics of Internal Markets (London: Croom Helm and New York: Columbia University Press).

Rugman, Alan M. (1985), "Internalization is Still a General Theory of Foreign Direct Investment", Weltwirtschaftliches Archiv.

Rugman, Alan M. and Jody Forsyth (1986), "Multinationals and Trade in Services", Dalhousie University working paper.

Smith, Alasdair (1986), "Strategic Investments, Multinational Corporations, and Trade Policy," Discussion Paper 137, Centre for Economic Policy Research.

Teece, David (1983), "Technological and Organizational Factors in the Theory of Multinational Enterprise", in Mark Casson (editor), Growth of International Business (London: Allen and Unwin).

Teece, David (1985), "Multinational Enterprise, Internal Governance, and Industrial Organization", American Economic Review 75, 233-238.

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