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Predation or spillovers? Foreign entry

and domestic welfare

by

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SIØS - Centre for International Economics and Shipping

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Predation or spillovers? Foreign entry and domestic welfare

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Abstract

This paper analyses the effects of foreign entry on domestic welfare. Foreign entry may increase competition in the local market and thereby improve domestic consumer surplus. It may also lead to spillover effects, which benefit both domestic firms and consumers. But foreign entry is also likely to involve some degree of profit shifting, as home country firms lose market shares to the foreign entrant. The profit shifting argument is particularly severe if the foreign entrant acts as a predator, eliminating local firms from the market. The analysis demonstrates that (i) the home country in some cases may be better off if the foreign entrant is a relatively high cost firm; (ii) high (potential) spillovers are not necessarily an advantage to the host country, and; (iii) economic integration, by bringing down trade costs, may make FDI a more attractive option for the host country than trade.

JEL classification: F23, L13, O14

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1 Introduction

The increase in foreign direct investment (FDI) that has taken place since the mid-1980s has motivated much research on the issue of foreign entry. The focus of the theoretical studies has been on the positive question; why do firms choose FDI rather than alternative modes of servicing foreign markets, typically exports? Host country effects of FDI and policy implications have received less attention.[1] One possible reason for this relative neglect may be the consensus that appears to prevail today that FDI is good for host economies, since it involves a transfer of foreign capital and technology, and that the challenge for host economies is simply to attract more of it. Even in less developed countries, where the scepticism against multinational companies and FDI has been widespread, the general attitude now seems to be far more positive. For instance, UNCTAD (1999) states that "Foreign direct investment is welcomed and, indeed, actively sought by virtually all African countries."

While it may well be true that, generally speaking, FDI is beneficial to host economies, from a theoretical viewpoint at least the picture is not so clear. For instance, Ono (1990) and Richardson (1998) demonstrate that foreign entry into a market characterized by imperfect competition may lead to a welfare loss for the home country. Particularly if the extent of foreign entry is small, the loss in local producer surplus is likely to dominate the gains in local consumer surplus. Motta (1992) shows that the host country is likely to be better off with a tariff which is sufficiently low not to induce the foreign firm to invest in the host country. Keeping the foreign producer at an arm's length distance, reduces the competitive pressure facing the domestic producer, resulting in higher domestic profits. A similar result can be found in Horstmann and Markusen (1992).

The present analysis extends the analyses referred to above by adding a dynamic dimension. This allows us to consider two additional issues which have received a lot of attention in the debate on the effects of foreign entry, namely spillovers and predation. Technological spillovers are widely seen as perhaps the most important benefit to the host country of foreign entry, particularly when entry is in the form of FDI. Such spillovers may improve the competitiveness of local firms, which in turn may benefit also local consumers. On the other hand, the foreign firm may use its technological and

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[1]Host, home, and domestic are terms which will be used interchangably in this article.

financial strength to eliminate local producers. This is sometimes referred to as predatory behavior. Predation is an extreme form of profit shifting, which due to the fact that local firms are eliminated, of course also precludes any actual technological learning on the part of local firms. Foreign entry is therefore associated with a potential for spillovers, a potential which may be realized only if the local firm survives in the competition with the foreign entrant.

Predation and spillovers may be of particular importance when the home country is a less developed one. Local firms are then likely to be fairly weak, implying that the learning potential may be large, but also that the degree of profit shifting in favor of the foreign entrant is likely to be strong, perhaps in the form of predation. For a discussion of spillovers and predation in less developed countries, see Blomström and Kokko (1997 and 1999), Blomström (1986a,b), and Lall (1978).

In line with most of the literature on foreign entry, we consider here the case of horizontal FDI, meaning that the objective of the foreign firm is to enter the home market in order to access local consumers. Compared to vertical FDI, where the foreign affiliate's output is exported out of the domestic market, the impact on host country welfare is potentially much stronger under horizontal FDI, where the foreign entrant competes directly with local firms in the local market. Also in line with most of the literature on FDI, we limit the options of the investing firm to greenfield investments and exports. Due to for instance host-country competition policies, acquisitions are not considered. For a related analysis which includes also the option of acquisitions, see Bjorvatn (2000).

The model shows that a host country may be better off if the foreign entrant is a relatively high cost firm. One interpretation of this result is that countries not necessarily should seek closer economic integration with the most advanced foreign countries; for a less developed country, South-South trade and investment may in some cases be a better choice than South-North trade and investment. An alternative interpretation is that the host country in some cases may be better off exposing its domestic market to a foreign exporter rather than a foreign investor. An exporter has to face trade costs, which decreases its competitiveness relative to the local producers, thereby reducing the extent of profit shifting and perhaps eliminating the danger of predation. For the same reason, strong (potential) spillovers are not necessarily good for the host economy, since this increases the incentive on the part of the foreign firm to act in a predatory way. Finally, we show that

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economic integration, by reducing trade costs, may make it more beneficial for the home government to invite a foreign firm as an investor rather than as an exporter. This result may add to our understanding of the somewhat puzzling observation that FDI has increased greatly in a time of reduced trade costs, an observation which runs contrary to the standard tariff-jumping argument, see for instance Motta (1992).

The paper is organized as follows: Section 2 presents the model, and section 3 the equilibrium analysis. Section 4 concludes.

2　The model

Consider the home country market for good Q. Initially, i.e., prior to economic integration, only one home firm is operating in this market, perhaps due to government regulation or credit constraints. Economic integration opens up for entry into the market. We shall assume that entry comes from abroad. Again, this may be due to credit constraints facing potential domestic entrants. Due to entry barriers, at most one foreign entrant may find it profitable to enter the home market. Entry barriers include advertising, establishing a distribution network, etc. In the case of greenfield FDI, there are also the costs of building a new production unit. And in the case of entry through exports, there are the additional costs of international trade, which may be more or less variable in nature.

Since we are concerned with domestic welfare rather than foreign firm profits, we shall not worry too much about the exact size of these entry costs. We can think of them as being low for the first entrant and infinitely high for the subsequent entrants.

There are two production periods in the model, $t = 1, 2$. Periodic demand in the home market is given by

$$Q_t = 1 - p_t, \tag{1}$$

where p_t represents the price in period t. Operating profits in period t for a firm of type i are

$$\pi_{it} = (p_t - s_{it}) Q_{it}, \tag{2}$$

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where s_{it} is the marginal sales cost in period t, defined as

$$s_{it} = c_{it} + \tau. \tag{3}$$

Here, c_{it} is the marginal production cost and τ is per unit trade costs, applicable in case producer i is an exporter.[2] Evidently, marginal sales costs may differ between firms for two reasons. First, there may by technological differences between firms implying $c_{jt} \neq c_{kt}$. Second, if the two producers are located in different countries, trade costs may create a wedge between the marginal sales costs of the competing firms.

We shall limit the number of possibilities by assuming that the foreign entrant is at least as efficient as the local firm; $c_f \leq c_{h1}$. This seems reasonable, given that an often referred *raison d'être* for multinationals is a technological edge which allows them to operate profitably in many locations. Technological supremacy on the part of the foreign firm is probably even more plausible if the host country is a less developed or perhaps an emerging economy, which is the kind of host economy we have in mind here.

Spillovers Spillovers may lead to a reduction in the home firm's production costs over time. Based on our assumption that the foreign firm has a technological edge over its local competitor, we assume that spillovers are one-way; from the foreign to the home firm. Exactly how foreign entry affects local firm production costs is of course an empirical question, and probably a very difficult one to answer. Spillovers may be channeled via the labor market, as local workers are trained in the foreign firm and later take their acquired knowledge to domestic firms. In this case, FDI, i.e., the local presence of foreign production, may be a precondition for local learning. Moreover, empirical evidence suggests that the spillover intensity from FDI may depend negatively on the technology gap between local and foreign firms, see for instance Blomström (1986a), Cantwell (1989), and Kokko et al (1996). Some kinds of spillover effects, on the other hand, may be independent of entry mode and the technology gap. Being exposed to (foreign) competition as such may force the domestic firm, which in the pre-liberalization enjoyed a protected monopoly position, to reduce organizational and technological

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[2] We shall generally view τ as a non-tariff trade barrier. In this case, τ does not enter domestic welfare directly, a fact which simplifies the analysis.

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inefficiencies, so-called X-inefficiencies.[3]

In our formulation of spillovers, we shall allow for all these aspects of spillovers. Let period 2 marginal production costs for the home firm be defined as

$$c_{h2} = \mu c_f + (1 - \mu) c_{h1} - x. \tag{4}$$

The variable x, which we can think of as capturing a reduction in X-inefficiency, applies as long as the local firm is exposed to (foreign) competition. Otherwise, that is, in case the local producer remains a monopolist, $x = 0$. The weight μ measures the strength of the technological spillover effect, and is positive only in the case of FDI. We shall consider both the case where μ is fixed and when it is a decreasing function of the technology gap, in which case it will be specified as

$$\tilde{\mu} = c_f/c_{h1}. \tag{5}$$

With $\mu = \tilde{\mu}$, period 2 marginal cost for the home firm can be found by using (4) as

$$\tilde{c}_{h2} = c_f^2/c_{h1} + c_{h1} - c_f - x, \tag{6}$$

which is a U-shaped function of the foreign marginal cost. Intuitively, when c_f is high, i.e., close to c_{h1}, there is not much to learn, since the foreign firm does more or less the same things as the local firm. When c_f is low, on the other hand, there is a lot to learn, but the local firm's ability to do so is low. Maximum learning, and therefore minimum $\tilde{c}_{h2}$, would in this case occur when the foreign firm is moderately more advanced than the local firm, i.e., for intermediate levels of c_f.

Predation Under predatory pricing, the aggressive firm, the predator, charges a price which is sufficiently low to eliminate actual competitors from

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[3]The standard reference on X-inefficiency is Leibenstein (1966), and for a more formal and recent analysis, see Horn et al. (1995). In an empirical contribution, Bergsman (1974) argues that X-inefficiency in protected markets in less developed countries may be very high.

the market and prevent potential competitors from entering. Economic theory points to a number of possible channels through which predation may be possible and profitable strategy for the aggressive firm, for an overview see Tirole (1988: Chapter 9.7). In the "long purse", or "deep pocket", version of predation, the prey is credit constrained, and must therefore finance necessary maintenance out of current profits. The aggressive firm can then set a price which is sufficiently low to prevent the prey from financing its maintenance expenditures, thereby forcing it to exit the market. Assuming that new entry takes time, the predator can subsequently enjoy monopoly profits for a period of time.

Let the survival condition for the home firm be $\pi_{1h} > 0 \Rightarrow p_1 > c_{h1}$. Thus, by charging a period 1 price (or equivalently, output) equal to c_{h1}, and thereby capturing the entire market in period 1, the foreign firm causes the home firm to exit, leaving the former with an unthreatened monopoly position in period 2.

There are two costs associated with predation for the aggressive firm. First, the predation price results in lower profits than what would have been achieved under accommodation. Second, in order to capture the entire market from its local competitor we shall assume that the foreign firm must invest in additional production capacity at a cost F. We can think of it as follows. The production capacity of a "normal" size plant is given by $c_{h1} - \varepsilon$ units. Since predation requires $Q_{f1} = c_{h1}$, this is not sufficient to eliminate the local competitor from the market. Predation therefore requires an investment in additional capacity, at an additional cost F, thereby allowing production to exceed c_{h1} units.

2.1 Payoffs

From (1) and (2), and our discussion of predation above, we can find equilibrium sales, the associated price, operating profits and consumer surplus (σ_t) under the three possible market outcomes. These data are listed in Table 1 below.

Table 1. Equilibrium data

	Monopoly	Duopoly	Predation by firm i
Q_{it}	$(1 - s_i)/2$	$(1 - 2s_{it} + s_{jt})/3$	$1 - s_j$
p_t	$(1 + s_i)/2$	$(1 + s_{it} + s_{jt})/3$	s_j
π_{it}	$(1 - s_i)^2/4$	$(1 - 2s_{it} + s_{jt})^2/9$	$(1 - s_j)(s_j - s_i)$
σ_t	$(1 - s_i)^2/8$	$(2 - s_{it} - s_{jt})^2/18$	$(1 - s_j)^2/2$

Since we are interested in the technology of the foreign firm relative to the home firm, we shall in the remainder of the analysis fix the initial level of domestic technology, as reflected in the marginal cost, at $c_{h1} = 1/2$. We analyse only cases where entry is profitable.

2.2 Domestic welfare

There are three scenarios, denoted by subscript $S = M, D, P$. Welfare in the various scenarios is the sum of consumer and producer surplus in the two periods, with future payoffs discounted by a factor ρ; $W^S \equiv \sigma_{h1}^S + \rho\sigma_{h2}^S + \pi_{h1}^S + \rho\pi_{h2}^S$ (which is also the order in which the terms are listed in the welfare expressions below). First, the case in which no foreign firm is invited to sell in the domestic market. The home firm would then have a monopoly position in both periods. This is the M (monopoly) scenario. From Table 1, welfare in this scenario can be found as

$$W^M = \frac{1}{32} + \frac{\rho}{32} + \frac{1}{16} + \frac{\rho}{16} = \frac{3(1 + \rho)}{32}. \tag{7}$$

The second scenario is the case where an accommodating foreign producer enters the market, resulting in Cournot duopoly in both periods. This is the D (duopoly) scenario, with welfare given by

$$W^D = \frac{(3/2 - s_f)^2}{18} + \frac{\rho(2 - s_f - \mu c_f - (1 - \mu)/2 + x)^2}{18}$$

$$+ \frac{s_f^2}{9} + \frac{\rho(\mu - 2\mu c_f + s_f + 2x)^2}{9}. \tag{8}$$

Finally, the case when a foreign entrant is a predator, which is the P (predation) scenario. Welfare is then given by

$$W^P = \frac{1}{8} + \frac{\rho \left(1 - s_f\right)^2}{8},\tag{9}$$

which consists simply of first and second period consumer surplus.

2.3 Foreign firm's choice

From Table 1, we can find equilibrium operating profits for the foreign firm in the predation scenario, i.e., predation in period 1 and monopoly in period 2, as

$$\pi_f^P \equiv \pi_{f1}^P + \rho \pi_{f2}^M = \frac{1}{2}\left(\frac{1}{2} - s_f\right) + \frac{\rho}{4}\left(1 - s_f\right)^2.\tag{10}$$

For simplicity, we assume that the host government's discount factor ρ is shared by the foreign producer. The alternative to predation is duopoly leading to a two-period Cournot-duopoly, which in equilibrium results in foreign profits

$$\pi_f^D \equiv \pi_{f1}^D + \rho \pi_{f2}^D = \frac{1}{9}\left(\frac{3}{2} - 2s_f\right)^2 + \frac{\rho}{9}\left(\frac{3}{2} - 2s_f - \mu\left(\frac{1}{2} - c_f\right) - x\right)^2.\tag{11}$$

To arrive at net profits, we have to subtract the cost of additional capacity F from predation profits. Let $\pi \equiv \pi_f^P - \pi_f^D - F$, i.e., the difference between net profits under predation and duopoly. Predation is the preferred strategy if $\pi > 0$, duopoly if $\pi < 0$.

3 Analysis

The variables we wish to focus on in this article are c_f, which indicates the technology gap between the foreign and local firm, and the spillover intensity μ. In order to carry out the analysis with as much clarity as possible, we need

to pin down some of the other variables of the model, namely the discount factor ρ, the capacity cost F, and the X-inefficiency variable x.

Changes in ρ have rather predictable implications for the analysis. A reduction in ρ, effectively making the future less important, reduces the profitability of predation (since predation involves trading off a cost today for the future benefit of increased market power), thereby shifting the π-curve in Figure 1 downwards. A reduction in ρ also increases domestic welfare associated with predation (since the cost of predation for the host government is associated with the future monopoly power of the foreign firm), thereby shifting W^P upwards relative to W^M and W^D. The opposite of course applies for an increase in ρ. We shall therefore refrain from comparative static exercises on ρ, and in the remainder of the analysis let $\rho = 1$, i.e., let both periods carry equal weight.

Regarding F, it is clear that if the cost of increased production capacity is very high, predation will never be profitable. For instance, given that $\rho = 1$ and given the simplest case of $\mu = 0$, it can be shown using (10) and (11) that π reaches its highest level at $s_f = \frac{6}{23} - \frac{8}{23}x$. Consequently, for predation ever to be profitable the following condition must hold

$$F < \frac{1}{23} + \frac{5}{23}x - \frac{7}{207}x^2, \tag{12}$$

which we assume is true.[4] Changes in F and x would have rather predictable effects on the model. An increase in F would reduce the profitability of predation and shift the π-curves in Figure 1 downwards, and vice versa. An increase in x would have the opposite effect, namely increasing the profitability of predation and therefore shifting the π-curves upwards, and vice versa. A change in x would also affect duopoly welfare, since it implies a change in the production efficiency of the local firm; an increase in x would shift the W^D-curve upwards, and a reduction in x would shift the W^D-curve downwards. For reasons of exposition, we shall in the remainder of the analysis assume that $F = x = 0.05$, which clearly satisfies (12). The qualitative results of the model, however, do not hinge on this specific assumption.

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[4]The condition (12) is derived for $\mu = 0$. Note that $\mu > 0$ strengthens the incentive for predation: The stronger is the spillover, the tougher is the future duopoly competition, and the more willing is the foreign firm to avoid such competition by eliminating its local competitor. Hence, (12) ensures that there exists some s_f for which predation is profitable, irrespective of μ.

We shall organize the analysis into three Scenarios, each based on a different assumption with respect to spillovers. Sections 3.1 and 3.2 describe the model in more detail, while Section 3.3 reports and discusses the results of the model.

3.1 Scenario 1

In this scenario, we shall abstract from spillovers related to entry mode or technology, and therefore let $\mu = 0$. This means that the only spillover-effect is that of reduced X-inefficiency associated with competition as such, namely x. From (4), we see that in this case $c_{h2} = c_{h1} - x$. The payoffs are given in Figure 1, with subscript 1 indicating Scenario 1. The horizontal axis is limited by $s_f = 0.725$, below which profits for the foreign firm are greater than zero in each period.[5]

Domestic welfare under predation is given by the W^P-curve in Figure 1. Since the local producer exits the market under predation, there is no recipient of the (potential) spillovers, and hence domestic welfare under predation is the same in all three Scenarios. The same of course applies for the monopoly case, given by the W^M-line.

Domestic welfare under duopoly in this Scenario is illustrated by the W_1^D-curve. Its U-shape results from exponentially increasing domestic profits and exponentially decreasing domestic consumer surplus as a function of s_f.[6] Intuitively, a reduction in s_f leads to a reduction in the market price, since the foreign producer becomes more competitive in the local market. The negative effect of this price fall on domestic profits is largest when s_f is high and therefore the market share of the home producer is high. The positive effect on consumer surplus is largest when s_f is low, and hence when the price decline affects a large quantity consumed, which can be interpreted as a large number of consumers. Domestic welfare is therefore at its lowest for intermediate values of s_f, values close to $c_h = 0.5$, where the loss in domestic profits from a drop in s_f is significant and the gain in consumer surplus is

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[5] From (11), we see that $\pi_{f2} > 0 \Rightarrow s_f < 0.725$, given that $x = 0.05$, $\rho = 1$, and $\mu = 0$. Note that $\mu = 0$ must necessarily hold for $s_f > 0.5$, since marginal costs this high implies that the foreign firm is an exporter, in which case by assumption $\mu = 0$.

[6] Ono (1990) and Richardson (1998) demonstrate that this property of domestic welfare, which was also noted by Dixit (1984), is fairly general. In particular, it holds for the case of Bertrand competition with differentiated goods, and for more general demand and cost functions.

modest.

The domestic gain from foreign entry is therefore higher the more different is the entrant from the incumbent domestic firm in terms of technology. Although the mechanisms are not the same, this result resembles the implications from trade theory based on comparative advantage, in which gains from trade grow in the differences between the trading partners; differences either in terms of technology or in terms of factor endowment.

We also see that in the present Scenario, π_1 is a hump-shaped function of s_f. This can be explained as follows. When s_f is high, the costs of predation are high, both because the period 1 limit price is far below the duopoly price, and because the profitability of the firm is modest, and hence the added capacity cost F looms large. Hence, with a fairly inefficient technology, the foreign firm will tend to choose accommodation, leading to duopoly.[7]

Moving to a lower s_f level, we see that the profitability of predation increases, at least up to a point. A lower s_f means lower costs of predation, both due to a reduction in the gap between the duopoly price and the limit price, and due to the relative decline in the importance of F as the profitability of the firm increases.

At still lower levels of s_f, the profitability of predation relative to duopoly drops. The reason is that while the costs of predation keep falling as we move leftward on the s_f-axis, the benefit of this strategy, as indicated by the gap between monopoly and duopoly price, falls as well. Note that for $s_f = 0$, the foreign firm's period 1 monopoly price, duopoly price, and predation price are identical, and equal to $1/2$. Clearly, at this point there is nothing to gain from predation, and the cost of F would be wasted.

Entry by a predator is not necessarily harmful to domestic welfare. Clearly, $W^P > W^M$ for $c_f \in (a, b)$. Entry by this type of firm might even generate more welfare to the home country than that of a less advanced accommodating firm; in Figure 1, domestic welfare with a predator characterized by $c_f = a + \varepsilon \approx a$ is clearly higher than with an accommodating foreign firm characterized by $c_f > c$.

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[7]For reasons of exposition, the lower part of the π_1-curve is not included in the Figure. In practice, the π_1-curve continues to drop, reaching a value of approximately minus 0.17 for $s_f = 0.725$.
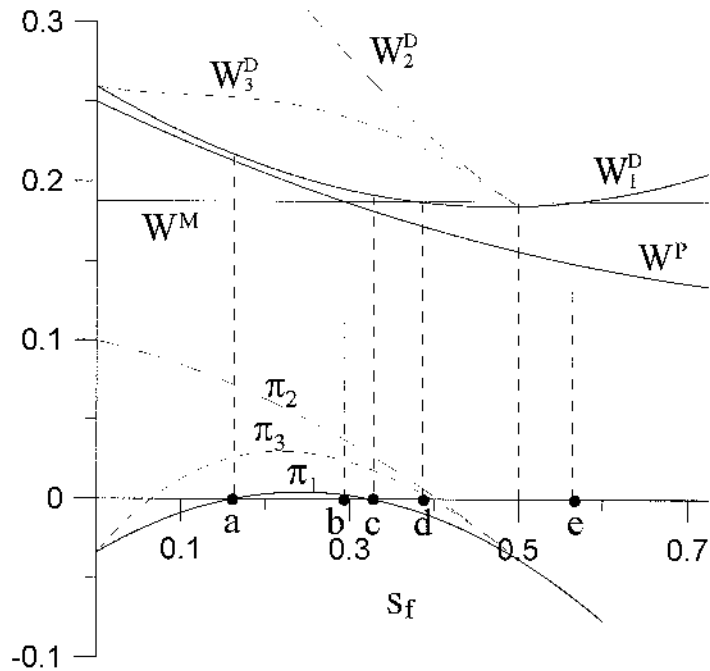
Figure 1: Scenarios 1, 2, and 3

3.2 Scenario 2 and 3

Here we open up for technology related spillovers, i.e., $\mu > 0$, and consider two cases. Scenario 2, where $\mu = 1$, which from (4) implies $c_{h2} = c_f - x$, and Scenario 3, where $\mu = \tilde{\mu}$, and c_{h2} therefore is defined by (6). Otherwise, the values of the exogenous variables are as in Scenario 1. We have assumed that technology related spillovers are linked to FDI, mediated for instance through the local labor market. In the case of exports, therefore, $\mu = 0$, and the situation is as in Scenario 1. Note that $s_f > 0.5$, which necessarily applies only in case the foreign firm is an exporter, by assumption involve $\mu = 0$. Payoffs for $s_f > 0.5$ therefore coincide with those of Scenario 1.

Adding technology related spillovers affects duopoly payoffs, both for the host country and the foreign firm. Naturally, higher spillovers improves domestic welfare in duopoly, since a more efficient local producer means higher domestic profits and a lower market price, leading to increased domestic consumer surplus. In Scenario 2, where the learning effect is stronger the more

efficient is the foreign producer, welfare, as indicated by W_2^D, increases almost linearly with a reduction in c_f.[8] In Scenario 3, on the other hand, spillovers reach their highest level for an intermediate technology gap, as described earlier. Welfare in this case, denoted by W_3^D, rises sharply as c_f moves below 1/2, but then flattens out as the technology gap widens and the spillover effect is reduced.

The profitability of predation relative to accommodation naturally increases as spillovers increase the future efficiency of the local competitor. In Scenario 2, π_2 increases monotonically with a reduction in s_f, which implies an increase in spillovers. In Scenario 3, the nature of spillovers, i.e., strongest for intermediate values of s_f, adds to the arguments that shape the π_1-curve, making π_3 even more hump-shaped than π_1.

3.3 Results

From Figure 1, we can derive the following result:

Proposition 1 *Host country welfare may be higher when the foreign entrant is a higher rather than lower cost supplier.*

Proof. To prove this proposition, consider Scenario 1 and the issue of FDI, i.e., the case where $s_f = c_f$ (< 0.5). Let the most advanced foreign firm considering investing in the home country be characterized by $c_f \in (b, c)$. If invited to invest, this producer would be aggressive and wipe out the local producer, leading to a welfare loss to the host country relative to both the duopoly and the monopoly scenarios. Clearly, the country would in this case prefer investment by a less advanced, and therefore accommodating, firm, such as one characterized by $c_f \in (c, d)$. ∎

Predation is an extreme form of profit shifting, leaving no profits at all for the local producer. But even without predation, the home country could be better off exposing its market to a foreign firm with fairly high marginal costs. To see this, consider a firm in Scenario 1 characterized by $c_f \in (c, d)$, which would be accommodating towards the local producer. For concreteness, let $c_f = d - \varepsilon \approx d$, yielding a small but positive welfare gain in the case of FDI relative to home firm monopoly. With trade costs initially such that

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[8]For reasons of exposition, the upper part of the W_2^D-curve is cut off. In practice, the curve increases almost linearly with a reduction in s_f, intersecting the vertical axis at a value close to 0.5.

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$\tau > e - d$, the home country would clearly prefer this foreign firm to enter the home market as an exporter rather than as an investor.

Proposition 2 *Lower trade costs may make it preferable for the home country to invite a foreign firm to enter as an investor rather than as an exporter.*

Proof. To prove this proposition, consider a process of economic integration in which trade costs are reduced. With $c_f = d$, there will be a critical level of trade costs, more precisely $\tau = e - d$, below which foreign entry via FDI is more profitable for the home country than exports. If it is in the power of the home country to influence entry mode, a reduction in trade costs may therefore lead to a change from trade to FDI. ∎

Note that a move from trade to FDI takes place not because of profitability considerations from the investing firm, but because of welfare considerations from the point of view of the host country.[9] This result may therefore shed some light on the rather puzzling observation that FDI has increased at the same time as economic integration has brought trade barriers down.

The basic argument underlying Proposition 2, is that domestic gains from duopoly are higher when the foreign firm is significantly *different* from the domestic firm in terms of marginal sales costs, for reasons explained at the outset of Section 3.1. As long as $s_f > c_{h1}$, economic integration, by reducing trade costs, also reduces the difference in sales costs between the foreign and domestic firm. The result is lower duopoly welfare in the home-country, as the local producer loses market shares and hence profits; a loss which dominates the increase in domestic consumer surplus resulting from the lower market price. The alternative for the host government is to invite entry in the form of FDI, thereby sacrificing domestic profits, but with a substantial gain for local consumers. In Figure 1, for $\tau < e - d$, the increase in consumer surplus associated with a shift from trade to FDI would dominate the resulting loss in local producer surplus.[10]

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[9] Foreign firms wishing to invest in a foreign country must typically apply for permission to do so from some government department and/or screening agency, such as a Board of Investment. The assumption that governments are able to influence entry mode therefore seems reasonable.

[10] If τ were a tariff, a shift from exports to investment would also affect domestic welfare through its effect on domestic tariff income. Naturally, the higher are the revenues generated from tariffs, the more attractive it is from the viewpoint of the domestic government to invite exports rather than FDI.

From Scenarios 2 and 3, which describe situations with higher (potential) spillovers from FDI, we also see that

Proposition 3 *Higher (potential) spillovers are not necessarily beneficial to the home country.*

Proof. Stronger (potential) spillovers means a larger potential home country welfare gain from foreign direct investment. But spillovers are only effective if the foreign firm chooses the accommodation strategy. Since larger spillovers means that the foreign firm in the future will meet a tougher local competitor, the profitability of predation relative to accommodation increases. In Figure 1, we see that the foreign firm chooses predation for a larger range of values of s_f. Larger spillovers are therefore not necessarily associated with a welfare gain for the host economy. Such gains occur only if the foreign investor chooses accommodation, which in Scenarios 2 and 3 is true for (approximately) $c_f \in (0.4, 0.5)$, and in Scenario 3 for (approximately) $c_f < 0.07$. For instance, whereas a foreign firm characterized by $c_f \in (c, d)$ in Scenario 1 would choose accommodation, in Scenarios 2 and 3 it would choose predation, leading to a welfare loss, both compared to duopoly and compared to the autarky scenario. ∎

4   Concluding remarks

Motivated by the large increase in FDI during the last two decades, there has recently been a lot of research on firms' choice between FDI and alternative modes of servicing foreign markets. In this research program, less emphasis has been placed on normative issues. The reason for this relative neglect may be that economists and policy makers generally feel that, on balance, FDI benefits the economies involved. But, theoretically speaking at least, foreign entry is not necessarily associated with a welfare gain to the host economy. Particularly when the host economy is a less developed country, with a technologically and financially weak domestic industry, there may be good reason to analyse the consequences of FDI more carefully.

The present paper is one step in this direction. Taking into consideration important issues such as technological spillovers and the possibility of foreign firm predatory pricing, the analysis reveals that small changes in the technology gap between the host country firm and the foreign entrant, may have quite large welfare implications for the host country. In some cases, a host

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country may be better off inviting a higher rather than lower cost foreign firm. Higher (potential) spillovers are also not necessarily positive for the host economy, since higher spillovers increase the profitability of predation for the foreign firm, thus eliminating the possibility of any actual learning effects on the part of local firms. Finally, economic integration, by reducing trade costs, may make FDI more advantageous than exports for the host country.

The results are derived from a partial equilibrium model with several simplifying assumptions. The generality of the results is therefore an open question, a fact which this paper shares with the rest of the industrial organization literature: Studies of imperfect competition necessarily involves a number of special cases. The economic intuition for the results is however quite clear, and I would suspect that the qualitative results would hold also for generalizations of the model. For instance, given that predation is possible but less profitable for higher cost foreign firms, the host country may be better off if a higher cost, and therefore accommodating, foreign firm enters the home market. The observation that the home country may be better off inviting a higher cost firm even if predation is not a threat, hinges on the U-shaped welfare function. Although the global properties of welfare functions may be an open question, it has been demonstrated by other authors, referred to above, that the U-shape is robust to different assumptions on functional forms and type of competition. Hence, the result that the host country may in some cases be better off if a foreign firm enters the market as an exporter than as an investor may be a fairly general insight. If this is true, then it follows that a reduction in trade costs may make FDI preferable for the host country compared to exports; a result which runs contrary to the standard tariff-jumping literature, but which may shed some light on the strong increase in FDI in a time of increased economic integration.

References

[1] Bergsman, J. (1974). Commercial policy, allocative efficiency, and "X-efficiency", Quarterly Journal of Economics Vol 86: 409-43

[2] Bjorvatn, K. (2000). Mode of entry: Exports, greenfield, or acquisition, Mimeo, The Norwegian School of Economics and Business Administration, Norway

[3] Blomström, M. (1986a). Foreign investment and productive efficiency: The case of Mexico, Journal of Industrial Economics, Vol 15: 97-110

[4] Blomström, M. (1986b). Multinationals and market structure in Mexico, World Development, Vol. 14: 523-530

[5] Blomström, M., and Kokko, A. (1997). How foreign investment affects host countries, Policy Research Working Paper 1745, March 1997, The World Bank

[6] Blomström, M., and Kokko, A. (1999). The determinants of host country spillovers from foreign direct investment: Review and synthesis of the literature, SSE/EFI Working Paper Series in Economics and Finance No 239, October 1999

[7] Cantwell, J. (1989). Technological innovation and multinational corporations, Oxford; Basil Blackwell

[8] Dixit, A. (1984). International trade policy for oligopolistic industries, Economic Journal 94, Supplement: 1-16

[9] Horn, H., H. Lang, and S. Lundgren (1995). Managerial effort incentives, X-inefficiency and international trade, European Economic Review 39: 117-138

[10] Horstmann, I.J., and J.R. Markusen (1992). Endogenous market structures in international trade (natura facit saltum), Journal of International Economics 32: 109-129

[11] Kokko, A. (1994). Technology, market characteristics, and spillovers, Journal of Development Economics, vol. 43: 279-293

[12] Kokko, A., R. Tansini, and M. Zejan (1996). Local technological capability and spillovers from FDI in the Uruguayan manufacturing sector, Journal of Development Studies, vol. 34: 602-611

[13] Lahiri, S., and Y. Ono (1997). Foreign direct investment, local content requirement, and profit taxation, Economic Journal, vol. 108, No 447: 444-457

[14] Lall, S. (1978). Transnationals, domestic enterprises and industrial structure in LDCs: A survey, Oxford Economic Papers, vol. 30: 217-248

[15] Leibenstein, H. (1966). Allocative efficiency versus X-inefficiency, American Economic Review 56: 392-415

[16] Motta, M. (1992). Multinational firms and the tariff-jumping argument, European Economic Review 36: 1557-1571

[17] Richardson, M. (1998). Foreign entry and domestic welfare, Weltwirtschaftliches Archiv Vol 134(2): 250-262

[18] Tirole, J. (1989). The theory of industrial organization, The MIT Press, Cambridge

[19] Ono, Y. (1990). Foreign penetration and national welfare under oligopoly, Japan and the World Economy, vol. 2: 141-154

[20] UNCTAD (1998). World investment report 1998: Overview, www.unctad.org

[21] UNCTAD (1999). Foreign direct investment in Africa: Performance and potential, June 1999, www.unctad.org

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