ARGUMENTA OECONOMICA
No 1 (10) 2001
PL ISSN 1233-5835

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INTEGRATION, MARKET PROXIMITY AND MULTINATIONAL CORPORATIONS

The opening of the markets in Poland and other Central and Eastern European countries (CEECs) has triggered a significant inflow of foreign direct investment into those countries. Empirical studies show that market seeking is one of the most frequent motives for setting up a subsidiary in CEECs. This paper presents in a theoretical model a rationale for setting up a subsidiary close to consumers. A firm supplies a foreign market either through export or through Foreign Direct Investments (FDI). The advantages of the FDI mode is connected with the advantages of market proximity. The firm gets exact knowledge about the demand conditions by being present directly on the market by a subsidiary. Integration increases the advantage of market proximity as the market becomes large and significant for the firm. Hence, the firm chooses to set up a subsidiary when markets get integrated.

INTRODUCTION

Following the opening of the markets in Central and Eastern European countries (CEECs), FDI to these countries has increased considerably. According to United Nations (1999) FDI inflows from the world to CEECs have increased from an average of $1,576 million in 1987-92 to $17,513 million in 1998. In the same period CEECs have increased their share of worldwide FDI as the share has increased from an average of 0.9 % in 1987-92 to 2.7 % in 1998. The more advanced transition economies of Poland, Hungary and the Czech Republic have attracted by far the highest share of the FDI to CEECs. In an empirical study, Brenton and Di Mauro (1999) found, using a gravity model, that FDI to Poland, Hungary and the Czech Republic is even higher than one would have expected on the basis of level of income, market size and distance to the market – variables that are all key variables in determining FDI.

The motives for investing in CEECs have been analysed in several studies. In a case study on Danish firms' investments in Poland by Jensen (2000) it is shown that market proximity interpreted as being present directly in a market plays a crucial role. Market seeking is by far the most frequent motive given by the Danish firms for investing in Poland. They are interested in the Polish

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markets because of the opportunities of the potential large markets for the firms' products. Other research (e.g. Meyer, 1998, Witkowska and Wysokinska, 1997, Estrin et al., 1997, Szanyi, 1998) comes to the same result for Poland and other transition economies. Hence, firms seem to make their decision to locate in CEECs through FDI on the basis of market proximity, i.e. on factors more related to the competition aspect than to differences in factor endowments and the subsequent transfer of resources.

A general explanation of FDI and multinational activity is given by Dunning in his OLI model (see Dunning, 1993 for a presentation of the OLI model). Three basic prerequisites must be in place before a firm undertakes foreign direct investment and becomes multinational. Firstly, the firm needs owner-specific advantages to be able to become multinational. Owner-specific advantages are advantages that the firm alone possesses and which can by used freely by the firm in several plants. Owner-specific advantages consist typically of knowledge about an advanced production process (e.g. a patent or a blue print). Owner specific advantages are created through research and development and accumulation of experience in the production of the specific good. Secondly, to make it profitable for the firm to produce in a foreign country rather than serving the foreign market through export, location advantages connected with the foreign market must be present. Examples of location advantages are factor endowments and costs, trade barriers and advantages related to market proximity. Finally, the firm must possess internalization advantages, i.e. advantages that makes it profitable for the firm to control the production in the foreign countries itself rather than to transfer the owner-specific advantages to local independent firms through a license.

Economic integration where trade barriers are removed changes the environment in which the firm is placed and this may influence the internationalization strategy of the firm. In the framework of the OLI model the location advantages change as trade barriers are reduced. This may (as forwarded by Kindleberger more than 30 years ago) induce the firm to prefer the export mode instead of setting up a subsidiary (Kindleberger, 1966). However, also the advantages of market proximity may change and, as shown in this paper, this may in some cases make internationalization through setting up a subsidiary to a preferred strategy. Contrary to the above referred empirical studies dealing with the market seeking motives for the inflow of FDI to the CEEC's, this paper is purely theoretical. The aim is to present a model which may give a rationale for setting up a subsidiary close to customers. It is assumed in the model that the only way to get reliable and exact information about the demand conditions on the market in a foreign country is to set up a subsidiary. This is substantial in the optimization process of the firm because

the importance of the international market increases with the integration process as trade costs are reduced. Hence, FDI increases with increased integration. In addition, it is also shown in the paper that an integration process, besides increased FDI, leads to increased trade indicating complementarity between FDI and trade. In order to present the main points in the analysis in the simplest possible way, the firm only considers to set up a sales company in the foreign market, i.e. production in the subsidiary is disregarded.

The paper is organized as follows. Section 1 presents and solves the model for the firm's internationalization strategy at given trade costs. The effect of a decrease of trade costs for the strategy of the firm is presented in section 2. Section 3 analyses the connection between integration and trade. Possible extensions of the model are outlined in the concluding remarks.

1. THE MODEL

In this section we develop the model that formally analyses the relationship between market proximity and FDI in an environment where markets get more integrated. The model builds on Jørgensen (1998). In relation to the OLI model we assume the following. Firstly, the firm has created owner-specific advantages which makes it able to become multinational. Secondly, we also assume that internationalization advantages exists, excluding a license strategy. Finally, the location advantages are connected with market proximity and the trade barriers. As trade barriers are reduced, location advantages change which may lead to a shift in the internalization strategy of the firm.

We only distinguish between two types of internationalization strategies of a firm. A firm from the home country can supply the foreign market either by export or by FDI. If the firm chooses the FDI solution, we assume that it establishes a subsidiary which only takes care of sales in the foreign market. There is no production in the foreign country but the firm re-organizes the value-added chain to become multinational as the last part – the sales part – is moved from the home country to the foreign country.

In the foreign market uncertainty about the market conditions exists and hence, fluctuations in demand are present. As production and sales are a time-consuming process the firm will take into account the uncertainty. If the firm chooses the export mode, it is assumed that the firm, due to insufficient feeling with the market, decides upon its production on the basis of expected demand. If, on the other hand, the firm chooses to establish a subsidiary it gains information about the market conditions. For simplicity we assume that the firm achieves full information about

the market and therefore makes the production decision on the basis of actual demand. However, the firm has to incur extra fixed costs.

The market condition is described by a monopoly due to an assumption of unique owner-specific advantages. The firm produces for sale both in the home market and the foreign market. The marginal costs are assumed to be independent of the production scale so that fluctuations in the international market do not influence the situation in the home market. Hence, the optimization in the two markets can be separated.

1. 1. Demand in the foreign market

The fluctuations in demand in the foreign market are specified by the following simple inverse demand function:

$$p = a - \frac{b}{1+\varepsilon} q \tag{1}$$

where p is the price, q is quantity, a and b parameters and ε is stochastic variable which is either $+\delta$ or $-\delta$ with the probability ½ for each outcome $(0 \leq \delta < 1)$.

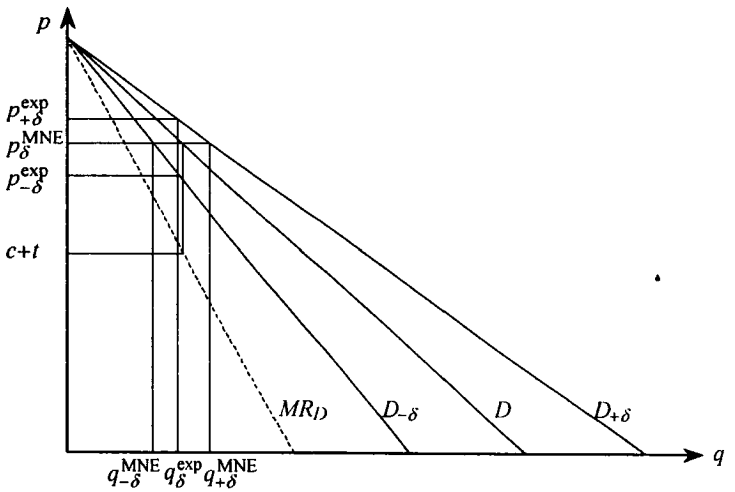

Figure 1.Equilibrium under different interationalization strategies
Source: Author's own.

The demand curve is shown in figure 1. The D-curve represents the expected position of the demand function or the demand function in the deterministic case ($\delta = 0$). The MR_D indicates the marginal revenue corresponding to the D-curve. The $D_{+\delta}$-curve and the $D_{-\delta}$-curve illustrate the two alternative positions of the demand curve under uncertainty. The parameter δ indicates the volatility of the international market.

1. 2. Export

If the firm chooses the export mode, it does not know the market demand when it plans for production. It therefore has to optimize on the basis of expected demand. Hence, the firm maximizes profit with respect to q according to (2)

$$\max_q \frac{1}{2}\left(a - \frac{b}{1+\delta}q\right)q + \frac{1}{2}\left(a - \frac{b}{1-\delta}q\right)q - (c+t)q \tag{2}$$

where c is variable costs and t is trade costs.

Solving (2) leads to the optimal quantity:

$$q_\delta^{\exp} = \frac{a-(c+t)}{2b}(1-\delta^2) \tag{3}$$

Before the actual sale in the foreign market but after the production has taken place, the market condition is revealed for the firm. With quantity given the firm then sets the price depending on the market condition:

$$p_{+\delta}^{\exp} = \frac{a+(c+t)}{2}(1+\delta) \vee p_{-\delta}^{\exp} = \frac{a+(c+t)}{2}(1-\delta) \tag{4}$$

The expected profit of the firm is given by:

$$\pi_\delta^{\exp} = \frac{(a-(c+t))^2}{4b}(1-\delta^2) \tag{5}$$

Figure 1 shows the optimal price-quantity combination.

Quantity, price and expected profit all depend on the uncertainty parameter δ. Increased uncertainty (higher δ) induces the firm to produce less. The disparity between the prices in the two market situations increases and the expected profit decreases. Intuitively, this makes sense, as the firm is hurt more

when uncertainty increases because of the firm's inability to adjust production to the actual market condition.

The situation where no uncertainty exists ($\delta = 0$) makes up the limit case and the deterministic profit is given by:

$$\pi_{\delta=0}^{exp} = \frac{(a-(c+t))^2}{4b} \geq \pi_{\delta}^{exp} = \pi_{\delta=0}^{exp}(1-\delta^2) \tag{6}$$

Hence, the deterministic profit is higher than the expected profit with uncertainty about the market conditions.

1. 3. Establishment of subsidiary

The firm is assumed to obtain full information about the market conditions by the establishment of a subsidiary. This gives the firm the possibility to adjust the production immediately to the demand conditions. The firm then faces the following maximization problem:

$$\max_{q_{+\delta},q_{-\delta}} \frac{1}{2}\left(a-\frac{b}{1+\delta}q_{+\delta}\right)q_{+\delta} + \frac{1}{2}\left(a-\frac{b}{1+\delta}q_{-\delta}\right)q_{-\delta} - \frac{1}{2}(c+t)(q_{+\delta}+q_{-\delta}) - G \tag{7}$$

where G denotes fixed costs connected with the establishment of a subsidiary. The fixed costs consist of costs associated with real estate, salaries to the employees, communication costs etc.

Solving (7) leads to the solution of quantity, price and profit:

$$\begin{aligned} q_{+\delta}^{MNE} &= \frac{a-(c+t)}{2b}(1+\delta) \wedge q_{+\delta}^{MNE} = \frac{a-(c+t)}{2b}(1-\delta) \\ p_{+\delta}^{MNE} &= p_{-\delta}^{MNE} = p_{\delta}^{MNE} = \frac{a+(c+t)}{2} \\ \pi_{\delta}^{MNE} &= \frac{1}{2}\pi_{-\delta}^{MNE} + \frac{1}{2}\pi_{+\delta}^{MNE} = \frac{(a-(c+t))^2}{4b} - G = \pi_{\delta=0}^{EXP} - G \end{aligned} \tag{8}$$

The solution is likewise shown in figure 1.

Note that the expected profit is independent of δ. A volatile market does not influence the expected profit as the firm immediately can react and adjust the production to the existing market conditions. Accordingly, the profit is equal to the deterministic profit minus the fixed costs.

Which strategy – export or establishment of a sales company – the firm shall choose depends on the size of the profit. Comparing (5) and (8) reveals

that the profit depends on the trade costs t. A shift in the trade costs influences profit in both cases as all production takes place in the home country of the firm. However, the profit maximizing internationalization strategy is sensitive to the size of the trade costs. This point is illustrated in figure 2 below.

Figure 2 presents a (t, π) diagram, where the profit expressions $\pi^{exp}_{\delta=0}$, π^{exp}_{δ} and π^{MNE}_{δ} are illustrated for a given value of δ. The profit expressions are second degree polynomials in t with the decreasing part as the relevant one. For the export solution the profit expressions are shown by the curve $\pi^{exp}_{\delta=0}$ if there is no uncertainty at all and by π^{exp}_{δ} if uncertainty exists. $\pi^{exp}_{\delta=0}$ and π^{exp}_{δ} cuts the vertical axis at the same point namely at the prohibitive level for trade costs. π^{exp}_{δ} is compared to $\pi^{exp}_{\delta=0}$ rotated around this intersection and the rotation is given by $(1-\delta^2)$. Thus, for every level of trade costs, π^{exp}_{δ} is less than $\pi^{exp}_{\delta=0}$ because uncertainty hurts the profit of the firm. If the firm chooses to set up a subsidiary, the profit expression is illustrated by π^{MNE}_{δ}. Uncertainty does not influence profit because the firm can adjust production immediately to the market conditions. However, fixed costs have to be paid and hence, π^{MNE}_{δ} is a parallel shifting of $\pi^{exp}_{\delta=0}$, where the shift is given by G.

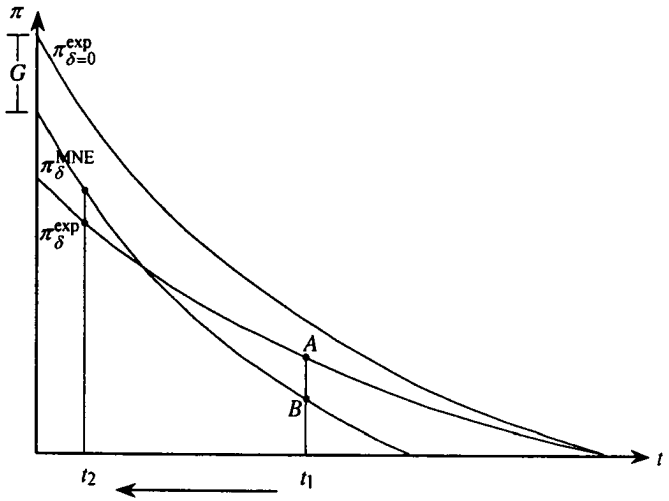

Figure 2. Integration and internalization strategy
Source: Author's own.

The firm's decision on how to supply the foreign market depends on t. For a given level of uncertainty and trade costs given by, say t_1, the optimizing internationalization strategy of the firm is shown in figure 2. The firm chooses to supply the foreign market by export, as the export profit (A) is higher than the FDI profit (B) at those trade costs. The reason is that with high trade costs, the demand in the foreign market for the product of the firm is small. Thus the importance of the foreign market is small and the firm chooses to live with the uncertainty instead of establishing a subsidiary and incur extra fixed costs.

2. INTEGRATION AND INTERNATIONALIZATION STRATEGY

In this model the integration process is analysed as a fall in trade costs. Now assume that the trade costs are reduced from the initial level of t_1 to t_2 (see figure 2). At t_2 the FDI solution yields the highest profit. The integration process has thus changed the firm's internationalization strategy from export initially to FDI through the establishment of a sales-subsidiary. The impact of the lower trade costs is that the firm sells a larger amount of its products in the foreign market. Hence, the incentive to be present in the market to gain immediate knowledge about the market situation is strengthened.

The market solution is sensitive to the level of the fixed costs as well as the degree of uncertainty. For a given level of trade costs higher fixed costs will lead to increased probability that the export mode is chosen. It will be more expensive to set up a subsidiary and the firm needs a higher sale to cover the fixed costs. However, for a given level of trade costs an increase in the uncertainty leads to the increased probability that the FDI mode is chosen. Profit is hurt more, the more volatile the market is when uncertainty about the market condition is prevailing.

Above we have measured integration as a fall in trade costs. Another dimension in an integration process is a harmonization of rules, law, standards, procedures etc. It both makes it easier to establish a subsidiary in another country and leads to less coordination costs a multinational has in connection with its subsidiary. In the present model the effect of this kind of integration is analysed by letting the fixed costs G fall. In relation to figure 2 we have that π_{δ}^{MNE} is moved towards $\pi_{\delta=0}^{exp}$. The result is a support and strengthening of the conclusions as the FDI mode is chosen for a higher level of trade costs everything else being equal.

3. INTEGRATION AND TRADE VOLUME

The quantity imported in the foreign country of the specific product, i.e. the sale of the firm in the foreign market depends on the chosen internationalization mode. If the firm on the one hand chooses to export its product the sale is given by (3). If the firm on the other hand chooses to set up a subsidiary, the sale depends on the market conditions, see (8). The expected sale when establishing a subsidiary is given by:

$$q_{\delta}^{\mathrm{MNE}} = \frac{1}{2}\left(q_{-\delta}^{\mathrm{MNE}} + q_{+\delta}^{\mathrm{MNE}}\right) = \frac{a-(c+t)}{2b} \tag{9}$$

By inspection of (3) and (9) it is evident that both with the export and the FDI solution a negative relationship exists between the sale in the foreign market and the trade costs. Furthermore, for a given level of uncertainty δ the following inequality holds true for every level of trade costs t^*:

$$q_{\delta}^{\mathrm{MNE}}\Big|_{t=t^*} > q_{\delta}^{\exp}\Big|_{t=t^*} \quad \forall t^* \tag{10}$$

The establishment of a subsidiary – and thus the elimination of uncertainty – triggers off a higher trade volume just as increased integration also leads to more trade. Trade and FDI are therefore complementary in this model contrary to simple neoclassical theory (eg. Mundell 1957).

The trade volume is illustrated in figure 3 in a (t, q)-diagram. The lines $q_{\delta}^{\exp}$ and $q_{\delta}^{\mathrm{MNE}}$ are illustrated for a given level, δ, of the uncertainty.

Assume that the integration level t' is the threshold value where the firm changes its internationalization strategy. Hence, trade is illustrated by the bold part of the lines. Initially the integration level is given by t_1. Now an integration process starts which lowers the trade costs to the level t_2. During this process the firm changes its internationalization strategy from the export mode to the FDI mode as analysed in figure 2. Trade increases through this integration process because of two effects. Firstly, due to the reduction in trade costs, trade increases. Secondly, the elimination of uncertainty increases trade. This effect is shown by the discrete jump in trade volume at t'. Note, that the parameter δ is crucial for the position of the $q_{\delta}^{\exp}$ and $q_{\delta}^{\mathrm{MNE}}$ lines. The higher the uncertainty the bigger the discrete jump in trade volume following the establishment of the subsidiary.

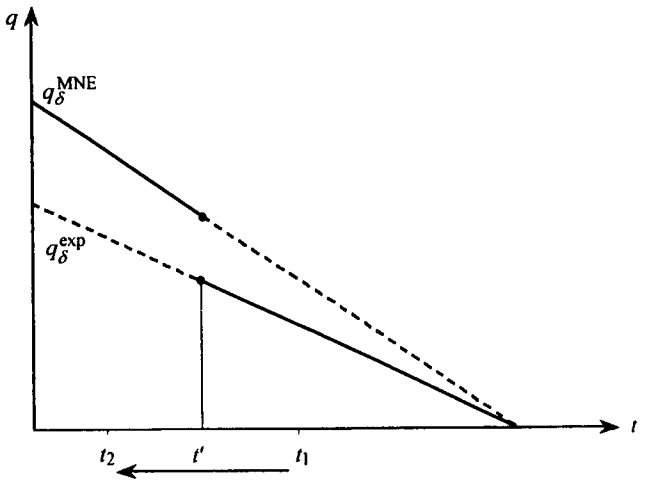

Figure 3. Integration and trade volume
Source: Author's own.

CONCLUDING REMARKS

The model analyses the relationship between market proximity, integration and the decision of the firm to either establish a subsidiary or to export. The internationalization strategy of the firm in this model is a result of an optimization process where information about the foreign market plays a crucial role. Information is in this context understood as knowledge about the market conditions. With a small and insignificant market the firm does not want to pay the price, i.e. the fixed costs G, to have full information whereas it is profitable on a large market to acquire the knowledge about the market conditions. A decrease in trade costs increases the potential for sale in the foreign market and this makes it more likely that a subsidiary will be established. It is furthermore shown in the model that trade and integration is positive related due to two effects. Firstly, removal of trade barriers increases trade and secondly, the change in internationalization strategy from export to FDI increases trade.

The theoretical result derived in the model gives *one* explanation of the observed development of increased FDI to the CEECs by focusing on market proximity. However, market proximity is an important motive for

investing not only in CEECs but also in the EU. Thomsen and Woolcock (1993) find in an empirical study that one of the main motives behind the increased multinational activity in the EU in connection with the creation of the Internal Market is the advantages of market proximity. The reason is that 'The threat of competition, together with the growing sophistication of products and consumers, means that firms must place greater emphasis on market proximity. Increasingly in many industries, export has become a second-best option.' (Thomsen and Woolcock, 1993, p. 6). It should however be stressed that this theoretical result only explains one element of the development of FDI to both CEECs and EU, i.e. to a group of countries where markets get more integrated. Many other aspects should be included to give a full and comprehensive description of the impact of regional integration on FDI. On the one hand, integration is a multi-dimensional process that changes the external environment of the firm. Depending on the kind of the integration process the internationalizations strategy of the firm may be influenced differently. On the other hand internal conditions of the firm are crucial as well when the firm chooses internationalization strategy. Types, motives and incentives for FDI vary between different sectors and hence, the impact of integration on FDI in a certain sector depends crucially on the characteristics of the specific sector. This model only emphasizes the demand dimension of the firm, but also production and strategic dimensions are decisive and affected by integration (see e.g. Jørgensen 1998, Markusen and Venables 1998, Smith, 1987 for a theoretical analysis of the production and strategic dimensions).

The model may be generalized into at least two dimensions. The first dimension would be to change the market conditions to oligopolistic competition. The firm will then face competition on the foreign market from local firms. To analyse this more general case game theoretical considerations need to be taken into account. The other dimension would be to generalize the modelling of market proximity. In the present model market proximity is connected with information about the market trend. However, other reasons to be present in the market by a subsidiary exist, e.g. market proximity could be advantageous because of better possibilities to adjust qualities to changes in the preferences of the consumers in markets for differentiated products.

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Received: 11.10.00; revised version: 12.01.01