



Industriens Utredningsinstitut

THE INDUSTRIAL INSTITUTE FOR ECONOMIC AND SOCIAL RESEARCH

A list of Working Papers on the last pages

No. 342, 1992

**RECONSIDERING THE CHOICE
BETWEEN TAKEOVER AND
GREENFIELD OPERATIONS**

by

Thomas Andersson, Niklas Arvidsson
and Roger Svensson

September 1992

Postadress
Box 5501
114 85 Stockholm

Gatuadress
Industrihuset
Storgatan 19

Telefon
08-783 80 00
Telefax
08-661 79 69

Bankgiro
446-9995

Postgiro
19 15 92-5

Reconsidering the Choice between Takeover and Greenfield Operations

Thomas Andersson, Niklas Arvidsson, Roger Svensson

The Industrial Institute for Economic and Social Research (IUI),

Box 5501, 114 85 Stockholm

September 1992

Abstract

This paper examines the distribution of greenfield operations vis-à-vis takeover as mode of entry for Swedish multinational firms between 1965 and 1990. The traditional view that takeovers are less risky than greenfield operations but have a lower expected rate of return, is here replaced by the perspective that different entry modes require different skills. An estimation based on the logit model finds that relatively more organizational skill, as captured by company size, number of affiliates and diversification, favours takeover. On the other hand, relatively more technological skill, reflected in R&D intensity, favours greenfield operations.

1 Introduction

According to now mainstream theory, direct investment requires that it is more advantageous for a firm to internalize its assets, rather than trade with another firm at arm's length (Dunning, 1977). In undertaking direct investment, however, a firm can choose between different modes of entry which require different capabilities. Broadly speaking, an investor may either acquire an existing firm, or set up a new venture, i.e. perform a greenfield investment¹. The mainstream perspective on this choice stipulates that takeovers are less risky than greenfield investments, but yield a lower expected rate of return (Caves, 1982). Consequently, a firm would become more willing to perform greenfield investments as greater international experience and skills increase its ability to handle risks.

A number of empirical studies have given support to this view. For example, Dubin (1976) and Stopford (1976) found that firms with a large portfolio of already established subsidiaries have a greater propensity to undertake greenfield investment. The propensity also increased with the geographical diversification of the established subsidiaries. Meanwhile, the greater a firm's diversification among different industries, and the faster its growth - indicating less knowledge and experience "per unit of activity" - the greater the propensity to use takeover.

In contrast to what might have been expected, however, there has been a marked tendency towards more takeovers, and less greenfield investments, in the last decades. Zejan (1990) interpreted this as evidence of a generally increasing instability and uncertainty in the financial markets between 1969 and 1978, which were the years he investigated. As discussed in UN (1992), the trend towards takeovers has continued in the 1980s. Meanwhile, the bulk of direct investment is established by a relatively small number of multinational corporations which continuously upgrade their experience and capabilities. The conventional view hardly appears consistent with the ongoing decline in greenfield establishments and increase in takeovers.

In practice, the riskiness as well as expected profitability of alternative modes of entry will depend on the capabilities and opportunities which confront the specific firms. This paper

¹ With "greenfield investment" is understood the establishment of a "new venture" which is not based on a former domestic firm. It may be organized as the restructuring of a former sales affiliate belonging to the foreign firm itself.

takes the view that a firm's ability to manage takeovers is determined by its organizational and managerial skill, while the profitability of greenfield operations is related to its specific technological skill. Concerning the characteristics of host countries, the internationalization and integration of factor markets have made purely national variables, like the size or growth of the host economy, less relevant for the supply and demand conditions that determine the pricing of firms. Compared to the previous literature, this set-up leads us to conclude on quite different influences from various industry and country-characteristics on the choice between takeover and greenfield operations.

For examination of hypotheses, we use the most detailed data base which exists on multinational firms. This builds on surveys of all Swedish multinationals undertaken by the Industrial Institute for Economic and Social Research (IUI) in Stockholm since the 1960s, which have been updated about every fourth year. In his study of entry modes, Zejan (1990) considered only the data provided in a single year, while this paper examines the whole set of studies for the first time. Thus, we are able to cover three decades of internationalization and a total of more than 1100 affiliates scattered all over the world.

Section 2 discusses the basic determinants of the choice of entry. Section 3 presents the data base and some pertinent empirical observations. A logit model and hypotheses for empirical testing are set up in section 4. The results of the estimation are presented in section 5. Section 6 concludes the paper.

2 The Choice of Entry

Direct investment may be motivated by a range of factors. In general terms, a firm foresees a potential for increased gains if it establishes production in a foreign market rather than trade through local representatives. The source of the gains may stem from, e.g., an enhanced ability to adapt to local demands, an increased bargaining power in regard to local counterparts, and/or technological advancement. A decision to enter, and the benefit from entry, is interrelated with the choice of how to enter the foreign market.

Establishing a manufacturing subsidiary means that a whole set of activities must be organized in a foreign market. A cluster of functions is required, e.g. the purchasing of inputs, engagement of personnel, production, marketing, distribution, etc. Arrow (1985) explains

vertical integration by the need of different units to communicate closely given demand or supply uncertainty, while Milgrom and Roberts (1990) emphasize the need to exploit complementarities between different units. Most literature views vertical integration as an attempt to handle problems between separate firms which relate to risk-sharing, moral hazard or adverse selection. When separate units must exchange a considerable amount of diverse information, it is impossible to construct contracts which make interaction at arm's length identical to interaction internalized within a firm.

The conditions under which internalization effectively does away with the problems of arm's length contracts are far from clear, however. Most of the literature assumes that vertical integration establishes complete harmonization of interests, while Grossman and Hart (1986) take the position that takeovers do not solve the problems at all. In practice, one will not end up at either of these endpoints. The extent to which vertical integration works out depends on the compatibility of different units, as well as the managerial and organizational capabilities.

Whether direct investment aims at vertical or horizontal integration into a foreign market, acquisition and greenfield operations raise partly different issues. Through acquisition, an investor is able to utilize synergetic effects with the special assets of an already established local firm. On the other hand, the acquired activities must be adjusted so as to comply with the needs of the purchaser. This alternative will be more desirable the greater the benefits of acquiring the existing assets of a foreign firm, and the greater the ability to reorganize and manage them under the new control. Greenfield operations, on the other hand, can be streamlined with the objectives and priorities of the parent company from the start. It must draw on the special assets and capabilities of the investor, but the problems of harmonization with an already existing firm are avoided. This alternative is more preferable the more specialized the activities of the investing firm are, and the smaller its organizational and managerial capabilities².

On this basis, we can formulate two fundamental hypotheses: Firstly, organizational skill favors takeover as the mode of entry into foreign countries. Secondly, technological skill favors greenfield operations. Here, it is the relative endowment of these skills that influence

² Compare with Williamson's (1989) distinction between skills that emanate from generally-enhancing investments and those that emanate from relation-specific investments.

the choice. A relatively larger amount of organizational skill, as compared to technological skill, will favor takeover, and vice versa. Organizational skill is related to the ability to incorporate new affiliates in the existing network, and the ability to reorganize them in an efficient manner. This grows with various kinds of experience, and can also be consciously developed through the diffusion of information and management techniques. Technological skill is related to invention, innovations or know-how, including a unique capability to manage a production process. This is likely to stem from R&D or acquired knowledge.

In addition, however, supply and demand conditions within the host country affect the opportunities and difficulties that confront new entrants. Let us consider three aspects of this:

- When stock prices are high, it is more expensive to buy an already existing firm, which favors greenfield operations. On the other hand, a shortage of attractive locations may make it costly to set up a new firm. Generally speaking, however, the role of the current market situation in individual economies is becoming less influential, since the continuing internationalization of financial markets reduces the extent to which local prices differ from international ones.

- Establishing a new firm takes more time than buying an already existing one. Thus, the need of rapid success, as well as the patience of the investing firm, will influence the mode of entry.

- The choice of entry depends on what presence a firm has already achieved in a host country. If a subsidiary has been established already, additional subsidiaries should complement the first one rather than compete with it. The previous presence may consequently influence the attractiveness of additional takeovers or greenfield operations.

Our hypotheses are based on the assumptions that the decision to undertake foreign direct investment has already been made. One might object that a takeover may be motivated by the benefits of acquiring a particular firm, rather than investing in a particular market. This should not distort our results, however, as the choice between a new venture and a takeover always remains. It is only the choice between takeover and greenfield investment that is analyzed in this paper, which is in line with the literature on entry modes. Our population of study is that of Swedish producing affiliates in the manufacturing sector.

3 The data base and some empirical observations

The data base consists of a questionnaire sent to all Swedish multinationals, covering the years 1965, 1970, 1974, 1978, 1986 and 1990. The survey includes questions about firms' consolidated operations, as well as questions regarding specific affiliates. There have been two sets of conditions for firms to be included. Firstly, firms must have been registered in Sweden, have had more than 50 employees and operated in manufacturing in the year of study. Firms located in Sweden but owned by foreign multinationals have been excluded. Secondly, firms must have been multinational, i.e. they must have owned more than 50 percent of at least one foreign affiliate in the year of study.

The population of these studies has been determined through search in the data base of Association of Swedish Statistics, and by using statistics from the Swedish Central Bank concerning Swedish firms' direct investments abroad. The data lists have also been extended and updated through telephone surveys. Throughout, more than 90 percent have answered the questionnaire, except for 1990 (75 percent have answered so far). The number of firms included in the data base is given by Table 1. In the tests, each affiliate is included only once, i.e. the first time it enters a multinational group. This means, for example, that only affiliates established from 1971 until 1974 are included in the figures for 1974.

Table 1. *Number of participating firms and affiliates*

Year	1965	1970	1974	1978	1986	1990
No of participating firms	81	107	108	122	108	82
No of foreign affiliates	328	418	480	567	646	596

As already pointed out, takeovers have become increasingly common over time, which can be seen in Table 2. Let us briefly consider how manufacturing affiliates established in alternative ways differ from each other. Table 3 shows figures per firm and per employee for all affiliates operating in 1990, divided according to mode of entry. All in all, 240 affiliates

Table 2. Modes of entry during different time periods. Percent.

	Greenfield	Takeover
Before 1960	66	21
1960 - 1970	57	40
1971 - 1978	38	61
1979 - 1986	28	70
1987 - 1990	19	81

had been established through takeover, and 150 through greenfield operations. As can be seen, takeovers are larger when considering employees and total assets, but there is a less marked difference in total sales. Concerning profitability, there is a certain edge for greenfield operations. The relative profitability of the two modes of entry has shifted over time, however.

Table 3. Figures per firm and employee, for 1990, for firms established through different modes of entry

	Per firm (MSEK)		Per employee (000' SEK)	
	Takeover	Greenfield	Takeover	Greenfield
Employees	490	298	-	-
Total assets	311	187	634	628
Total sales	458	349	934	1170
Value of M&I	94	47	191	158
Investments in M&I	20	12	41	38
R&D expenditure	4	2	8	8
Wages&salaries	102	47	209	157
Profit before depr.	31	27	64	91
Profit after finan- cial items	15	17	30	56

Table 4. Shares of all new establishments during the last three decades in different regions. Percent.

	1960s	1970s	1980s
EC	60	59	56
EFTA	16	15	17
North America	6	12	20
Africa	1	1	1
Asia	2	3	2
Latin America	15	10	4
Total	100	100	100

The geographical division in Table 4 shows that an increasing share of new affiliates is located in industrialized countries. This reflects the overall trend in the location of all foreign direct investment from industrialized countries (UN, 1992). It is also interesting to note, although not shown in Table 4, that the share of takeovers increases over time throughout all regions.

Industrial comparisons show that takeover is the most common way to establish an affiliate in most instances, except for textiles, mining and metals. It can be noted that metal goods, machinery, electronic equipment and chemistry industries account for 80 percent of all takeovers in the period 1986 to 1990. However, we can not observe the relative importance of organizational and technological skills on the industrial level. We have to analyse the development on the firm-specific level.

4 Logit model and hypotheses for empirical testing

Takeover as a mode of entry is used as dependent variable in the tests below. This variable is dichotomous in nature, taking the value zero if a manufacturing affiliate was established as a new firm or developed out of an already existing sales affiliate, and otherwise one. A logit probability model is constructed to predict whether the investing firm acquires an

existing company or establishes a new firm.

In the following, we will only make a brief presentation of the logit model. For a more thorough discussion, see Amemiya (1981). The logit model is based on the cumulative logistic probability function. The model can be written as:

$$\text{Log} \frac{\text{Prob}(Y)_i}{1 - \text{Prob}(Y)_i} = Z_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \varepsilon_i$$

Here, the X's correspond to either attributes of the host country in which the affiliate is started, or attributes of the investing firm. Prob(Y) represents the probability that an investing firm will take over a foreign competitor, given the values of the X's. The β 's can be interpreted as the impact of various firm and country attributes on the decision to perform a takeover. One may not treat these parameters as in usual regression models, however, because of the logarithmic transformation of the dependent variable. The residual is assumed to have the desirable properties: $\varepsilon \sim N(0, \sigma^2)$ and $E(\varepsilon_i \varepsilon_j) = 0$ for $i \neq j$. The variable Z is an unobservable random index, which can be interpreted as a propensity for an individual firm to choose an acquisition in a certain country. The i :th firm will perform a takeover, if and only if, $Z_i = X_i \beta + \varepsilon_i > 0$. Thus, it is only the sign of Z that matters for the binary choice.

Since our explanatory variables are continuous and every observation has a distinct probability associated with it, the logit model was estimated using a nonlinear maximum-likelihood estimation procedure. This estimation technique yields consistent parameter estimates and has a number of other desirable statistical properties. For large samples all parameter estimates are known to be efficient and normally distributed. Since more than 850 observations are included in the tests, the model yields trustworthy results.

Concerning the explanatory variables, it is not possible to directly observe skills, particularly not organizational skill, but proxy variables must be used. As "skill" is a multi-dimensional concept, we can include several alternative proxies for either kind of skill without running into problems with multicollinearity. Simultaneity problems might instead have been expected since entry in a foreign market influences the organization of a multinational firm as a whole. It has been difficult to trace the connections between R&D and market structure in the form of monopoly or perfect competition, for example, since both are endogenous

variables determined within a larger structure. This is hopefully a minor problem in the present context, however, since most affiliates are established by large multinational firms, and exert only a marginal impact on the organization of these firms as a whole.

The definitions of our explanatory variables and descriptive statistics are found in Table 5. The rationale for their inclusion, and the expected impact, is as follows:

X₁; The size of the acquiring company, measured as total turnover, is related to organizational skill. The larger the organization, the greater the organizational skill that is needed. While this may account for a positive influence on the probability of takeover, it is unclear how company size relates to technological skill, which makes the impact of the variable somewhat uncertain. In the earlier literature, size has simply been associated with greater skill in general and, consequently, been related to a greater propensity to undertake greenfield operations.

X₂; The previous number of manufacturing affiliates is a more comprehensive variable for the amount of organizational skill relative to technological skill. A firm needs relatively more organizational skill the larger the number of different companies in which it controls production. Thus, we expect this variable to exert a positive effect on takeover, which is in contrast with the previous literature.

X₃; The level of diversification is yet another strong indicator of the organizational relative to the technological skill of a multinational firm as a whole. An increased probability for takeover is in line with the traditional view. The diversification variable is defined as the number of industries that the manufacturing affiliates are operating in.

X₄; The product distance between the affiliate and the parent company is related to both technological and organizational skill. The greater the distance, the smaller the technological skill that is relevant for this particular venture, and the smaller the incentive for the parent company to build on its own specific assets. At the same time, the product distance is not possible to handle successfully without a strong endowment of organizational skill. As with the preceding variable, the expectation of a positive impact is in line with earlier studies. It is difficult to measure product distance appropriately, however. Our construction is that of a dummy variable which takes the value 1 if the parent company and the affiliate are operating

in different industries, and 0 otherwise.

X_5 ; The R&D intensity in the investing company, defined as total R&D expenditure divided by total turnover, measures the efforts within the investing company to develop specific technological skill. This should, in consequence with our earlier discussion, be negatively related to the probability of takeover. To our knowledge, the role of this variable has not previously been investigated in this context, perhaps due to lack of data.

X_6 ; The existence of previous affiliates in the host economy is measured as a dummy variable, taking the value 1 if the investing firm had established at least one affiliate before

Table 5. Variable definitions and descriptive statistics

Variable	Definition	Mean	Median	Std.dev.	n
Y	Mode of entry	0.65	1	0.48	863
X_1	Company turnover - (MSEK)	2511	1237	3737	863
X_2	Number of affiliates	21.7	12.0	26.2	863
X_3	Diversification	2.09	2.00	1.32	863
X_4	Product distance	0.38	0	0.48	863
X_5	R&D intensity	0.023	0.015	0.024	863
X_6	Earlier establishment	0.37	0	0.48	863
X_7	Income level - GDP/c (SEK)	14828	15113	7083	863
X_8	Size of foreign economy - GDP (SEK billions)	1085	394	1763	863
X_9	Growth rate of the host country - (GDP)	3.60	3.40	1.08	863
X_{10}	Time	17.5	18.0	8.1	863
D_1X_1	Dummy variable for X_1 (D=1 for the period 1979-90).	3838	2203	4913	404
D_2X_9	Dummy variable for X_9 (D=1 for the period 1979-90).	3.50	3.00	0.99	404

already, and 0 otherwise. We expect that firms with already existing manufacturing affiliates aim for increased complementarity with old ones, and avoid raising the competitive pressure. This should favor takeover, rendering a positive influence on our dependent variable.

X_7 ; The income level, which is estimated by GDP per capita, indicates the level of sophistication in the host economy, including the quality of possible objects for takeover. It will also be less troublesome and time-consuming to undertake an acquisition in a highly developed economy with a well-functioning stock market. This should exert a positive impact, which is consistent with the earlier literature.

X_8 ; The size of the foreign economy, measured as GDP, may exert an ambiguous influence. Given that markets are segmented, it indicates greater scope for greenfield operations because a new firm adds relatively less new competition the larger the economy is. This should account for a negative effect. On the other hand, a greater economy may have more suitable objects for takeover, and offer an investor a better bargaining position. In case this effect dominates, we would instead expect a positive impact.

X_9 ; The growth rate of the host economy, measured by average annual growth of GDP for the whole period of study, is related to the need to act quickly in order not to forego potential gains. As a takeover creates access to already existing facilities, there should be a positive impact on the probability of takeover. On the other hand, a rapidly growing economy may have more scope for new firms, in analogy with a large economy. This would then favor a negative effect. Thus, the expected influence is ambiguous.

X_{10} ; Time may be hypothesized to affect the entry mode since firms' international experience and organizational capabilities improve gradually. Of course, knowledge in specific technology improves over time as well, but this is matched by similar advancements in competing firms. This suggests that time exerts a positive influence on the probability of takeover. This view contrasts with Zejan (1990), who suggested that takeovers become more common because of a growing instability and uncertainty.

Admittedly, the connection between time and the relative strength of technological and organizational skills is weak. It would be preferable if the other explanatory variables were sufficient to explain the increase in takeover over time. We will consequently perform tests without the time variable included. Moreover, we may expect the explanatory power of some of the other independent variables to change over time. For example, purely national determinants of supply and demand conditions may become less important with the continued internationalization of the financial markets. A few structural shifts in the influence of explanatory variables have been examined through dummy constructions, which are reported in connection to the results.

5 Results of the estimation

The resulting estimates are given in Table 6. Three different models were run, due to some variation in the use of dummy variables and inclusion of the time variable. Two different measures of the explanatory power of the logit model are given below the estimates in Table 6. Firstly, we tested the hypothesis that all parameters were equal to 0, using the likelihood ratio test which follows a chi-square distribution. Here, the results were highly favorable, and almost identical for all three models. Secondly, the number of wrong predictions was calculated for each model. This rendered, again, highly satisfactory results, since more than 70 percent of the predictions were correct. The outcome was roughly the same for all three models in this case as well.

There is no problem with multicollinearity in the model, which can be seen from the correlation matrix given in appendix 1. We also examined some attributes of the affiliates, for instance R&D intensity and turnover weighted by market size. However, such variables were excluded owing to two reasons. Firstly, they are likely to bias the model due to simultaneity problems, and secondly, they were all insignificant. Such affiliate-specific variables are endogenous in the model and in part determined, through one or more separate equations, by the dependent variable.

Let us look at the statistical findings. We start by analyzing the variables primarily related to organizational skill. The coefficient of variable X_1 , the turnover of the company, has the expected positive sign in the last two models and is clearly significant. Meanwhile,

the dummy variable D_1X_1 is significant in both model 2 and 3, but has the opposite sign of X_1 . This indicates that the size of the company was positively related to the probability of a takeover before 1979, but that the impact disappeared in the period 1979-90 (model 2 and 3).³ A more appropriate proxy variable for the relative amount of organizational and technological skill in the parent company, X_2 , favors takeover more consistently. The coefficient is significant and has the expected positive sign in all models, which is in accordance with our predictions. Variable X_3 , which reflects company diversification, similarly has the positive impact on acquisitions, and is significant in two of the models (1 and 2).

The product distance, X_4 , related to both technological and organizational skill, performed poorly in all runs. It is true that the coefficient has the expected sign, but it is not significant. This may be due to the problem of developing an accurate measurement of product distance. However, the variable measuring technological skill, the R&D intensity of the parent company (X_5), exerted a convincing effect. In all three runs there were clearly significant negative impacts, implying that firms' efforts to develop their own skills resulted in a preference for greenfield operations rather than takeovers. There is also another important finding. While R&D intensity is as good a proxy for technological skill as we can get, it is uncorrelated with the variables X_1 through X_4 (see appendix), which we believe to have a clear connection to organizational skill. This supports our basic hypothesis that the concepts of organizational and technological skills can be separated indeed.

An investor's earlier presence in the market, X_6 , exerted a positive impact in model 1 and 3. Thus, already established affiliates located in a country favor takeover when adding a new affiliate. This result is as expected with a desire to maintain, or reduce the competitive pressure on earlier establishment. Considering the host country variables, the growth rate of GDP (X_9) was significant across all runs. The negative sign supports the hypothesis that more greenfield operations are established in a rapidly growing economy. A dummy, $D2X_9$, included for the period 1979-90, turned out significant in model 3. This indicates that the growth rate of the host economy did not exert any impact on the entry mode after 1979. On the other hand, the dummy variable was insignificant in model 2.

³ The two last models clearly show that X_1 's impact on the mode of entry has changed over time. In model 1, however, X_1 was estimated for the whole period of study which is the reason why it was insignificant.

Table 6. Estimation results of the logit model

Variable	(1)	(2)	(3)
Intercept	-0.4799 (0.4328)	-0.6636 (0.4877)	-0.1156 (0.4603)
X ₁	-8.784 E-6 (3.32 E-5)	2.116 E-4 ** (8.92 E-5)	2.644 E-4 *** (8.92 E-5)
D ₁ X ₁	-- --	-2.38 E-4 *** (8.83 E-5)	-2.938 E-4 *** (8.79 E-5)
X ₂	0.0123 * (0.0064)	0.0112 * (0.0062)	0.0139 ** (0.0061)
X ₃	0.1309 * (0.0878)	0.1545 * (0.0899)	0.1001 (0.0881)
X ₄	0.1943 (0.1796)	0.1970 (0.1803)	0.1596 (0.1783)
X ₅	-6.2040 * (3.2348)	-6.5848 ** (3.2871)	-6.8123 ** (3.2679)
X ₆	0.4089 ** (0.2064)	0.3134 (0.2096)	0.3508 * (0.2080)
X ₇	1.740 E-5 (1.700 E-5)	2.03 E-5 (1.82 E-5)	4.33 E-5 *** (1.60 E-5)
X ₈	-8.935 E-5 * (5.521 E-5)	-8.264 E-5 (5.512 E-5)	-9.711 E-5 * (5.51 E-5)
X ₉	-0.1789 ** (0.0805)	-0.2056 ** (0.0857)	-0.2251 *** (0.0860)
D ₂ X ₉	-- --	0.0481 (0.0832)	0.2674 *** (0.0593)
X ₁₀	0.0632 *** (0.0123)	0.0663 *** (0.0183)	-- --
Chi-square value of the likelihood ratio test	212.9	221.7	208.4
Prob > Chi-sq.	0.0001	0.0001	0.0001
No. of wrong predictions (per cent) ^a	29.0	29.9	29.8

Standard errors in parenthesis. Levels of significance are ***, ** and * significant at 1, 5 and 10 per cent respectively. Size of sample equals 863.

^a at critical probability of 0.5.

The other two foreign country variables (X_7 and X_8) exert ambiguous effects. Still, the income level has the expected positive sign in all runs, and is significant when the time variable is excluded. Country size exerts a significant negative impact on the probability of acquisition in two of the models on the 10 percent level. There is consequently some evidence that a larger host economy is conducive to greenfield operations.

Finally, the time variable (X_{10}) was clearly positive and significant when it was included. The estimation was at least as good with the time variable excluded, however, showing that our other explanatory variables did fine on their own. On the whole, they did well to determine the factors influencing the mode of entry.

6 Conclusions

Our findings support the perspective on organizational and technological skills presented in section 2. Relatively more organizational skill favors takeover, while relatively more technological skill favors greenfield operations as the mode of entry when establishing subsidiaries abroad. Consideration to risk and expected returns is consequently not sufficient to understand the determinants of how to enter a foreign economy.

The variables associated primarily with organizational skill, i.e. company turnover, number of affiliates and diversification, all exerted a positive influence on takeover when significant. R&D intensity, measuring technological skill, exerted a negative influence in all models, while the product distance was insignificant. The presence of previous establishments in the host country increased the probability of takeover when significant, indicating that new establishments are complementary to earlier ones. Among the country variables, GDP per capita exerted a positive impact on takeover, while GDP and growth rate of GDP had a negative impact when significant. Finally, the time variable exerted a positive impact on takeover, but the model explains the variation in entry modes just as well without time included. Tests of structural shifts suggest that the influence of company size and the growth rate of the host economy diminished over time.

Even though the data covers only Swedish multinationals, there is no indication that the results would not be universally applicable. For example, the Swedish multinationals have behaved the same as those based in other countries with respect to their increased emphasis

on highly developed markets, and increased use of takeovers rather than greenfield operations. Of course, the Swedish multinationals' may behave differently because of their long international experience or small home market. It would be interesting to see studies on the role of organizational vis-à-vis technological skills for the entry strategies of multinationals based in other industrialized countries as well. There is also a need of empirical work which examines the connection between entry modes and the undertaking of direct investment. More fundamentally, we need to further explore the interaction between what has here been broadly referred to as organizational and technological skills, and how they relate to the internalization of operations in different kinds of affiliates.

References

- Amemiya, T., Qualitative Response Models: A Survey, *Journal of Economic Literature*, 19, 1483-1536.
- Arrow, K., 1985, Vertical Integration and Communication, *Bell Journal of Economics*, 6, 173-183.
- Caves, R., 1982, *Multinational Enterprise and Economic Analysis*, Cambridge University Press, Cambridge.
- Dubin, M., 1976, *Foreign Acquisitions and the Spread of the Multinational Firm*, D.B.A. thesis, Graduate School of Business Administration, Harvard University.
- Dunning, J.H., 1977, Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach; in Ohlin, B., Hesselborn, P-O., and Wijkman, P.M., eds., *The International Allocation of Economic Activity: Proceedings of a Nobel Symposium Held at Stockholm*, 395-418, Macmillan, London.
- Grossman, S., and Hart, O.D., 1986, The Costs and Benefits of Ownership: A Theory of Lateral and Vertical Integration, *Journal of Political Economy*, 94, 691-719.
- Milgrom, P., and Roberts, J., 1990, The Economics of Modern Manufacturing: Technology, Strategy and Organization, *American Economic Review*, 80, 511-528.
- Stopford, J.M., 1976, Changing Perspectives on Investment by British Manufacturing Multinationals, *Journal of International Business Studies*, 7, 15-27.
- United Nations, 1992, *World Investment Report - Transnational Corporations as Engines of Growth*, United Nations, New York.
- Williamson, O.E., 1989, Transaction Cost Economies, in Schmalensee, R. and Willing, RD, eds., *Handbook of Industrial Organization*, 1, Elsevier Sciences Publishers, B.V. , 134-182.
- Zejan, M.C., 1990, New Ventures or Acquisitions. The Choice of Swedish Multinational Enterprises, *Journal of Industrial Economics*, 38, 349-355.

Appendix Table 1
Correlation Matrix

X_1	0.175									
X_2	0.239	0.748								
X_3	0.234	0.504	0.613							
X_4	0.074	0.024	0.156	0.321						
X_5	-0.051	0.145	0.033	-0.055	-0.126					
X_6	0.222	0.404	0.578	0.493	0.154	0.104				
X_7	0.203	0.131	0.115	0.115	-0.084	-0.006	0.141			
X_8	0.057	0.048	0.045	0.072	-0.054	0.107	0.147	0.541		
X_9	-0.125	-0.035	0.002	-0.072	0.041	0.083	-0.083	-0.482	-0.249	
X_{10}	0.289	0.304	0.317	0.193	-0.122	0.108	0.203	0.524	0.243	-0.075
	Y	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9

