NBER WORKING PAPER SERIES

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Working Paper No. 2987

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 1989

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ABSTRACT

This paper uses a model of dichotomous choice to distinguish the characteristics of Swedish multinational firms that seek out joint ventures from those that do not. The findings suggest that firms with little experience of foreign production and highly diversified product lines are the most likely to share equity. In general, it is found that multinational firms that have the most to offer the developing countries are reluctant to enter into joint venture agreements. Therefore, imposing joint-venture status on multinationals may prevent the inflow of advanced technologies.

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Why Do Multinational Firms Seek Out Joint Ventures?

Magnus Blomström and Mario Zejan*

1. Introduction

Since the early 1970s, we have witnessed an increasing desire in a number of developing countries to exercise greater control over the activities of multinational corporations (MNCs). Many countries have started to frame the environment within which these firms operate and have introduced various performance requirements for their behavior. Special attention has been given to policies regarding technology transfer. A number of measures intended to encourage multinational firms to transfer more technology have been introduced over the years, including requirements for a certain degree of local participation in the ownership of the MNCs' affiliates. By forcing the multinationals to "unbundle the package" of inputs that they bring to the host country, it is believed, a host country can enable local firms to obtain access to these inputs without the traditional direct investment.

Before conclusions about such effects can be drawn, however, one has to know the costs of the "unpackaging." For example, policies aimed at forcing multinationals into joint-venture agreements may impede the inflow of advanced technologies, since firms may choose not to invest rather than to accept local equity participation. In this paper, we take a first step

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towards understanding these costs by analyzing the characteristics of multinational firms that insist on majority-ownership of their foreign affiliates and the characteristics of those that do not. We, thus, focus on the determinants of different patterns of ownership and control of foreign affiliates of MNCs, and ask why multinational firms seek out joint ventures.

Previous studies of the strategy alternatives for potential multinational firms have mainly focused on why a company would choose to become multinational rather than exploiting its firm-specific advantages by exporting (see Caves, 1982, for a review). However, given that a firm has decided to invest abroad, it can do so with varying degrees of equity participation. The main investment alternatives are majority-owned affiliates, which permit control over the foreign project, and minority participation or joint ventures. These alternatives offer different advantages and disadvantages for the MNCs and the question is why they choose one over the other.

So far, there has been no empirical study of this issue using comprehensive, quantitative firm-level data. Apart from a few case studies (see references in Lecraw, 1984), from which generalizations are dangerous, the regression analyses are based either on small samples of firms (Stopford and Wells, 1972, and Fagre and Wells, 1982) or on small samples of host (developing) countries (Lecraw, 1984). Furthermore, none of these studies uses quantitative data for some of the most important explanatory variables. Lecraw, for example, uses a subjective ranking, as perceived by the affiliates' managers, for the "technological leadership" of the parent

companies and for the "attractiveness" of the host countries.

Another possible serious limitation of the earlier statistical studies is the way in which they construct the dependent variable. By using the level of equity ownership in a continuous fashion, they obscure the idea of control over the foreign affiliates. For example, a drop in equity participation from 51 to 49 per cent is different from a drop from, say, 49 to 47 per cent. Therefore, we argue that one should look at this as a choice problem, where a firm faces the choice of controlling its foreign affiliate (majority-ownership) or not controlling it (minority venture). In this context, it is possible to describe firm behavior analytically using a model of dichotomous choice. The parameters of such a model, estimated using the maximum likelihood technique, help distinguish the characteristics of firms that insist on majority ownership of their foreign affiliates from those of firms that do not, and, thus, to shed light on the potential benefits for the host developing countries of various forms of foreign investment.

This study uses unique data covering almost the entire population of Swedish manufacturing firms operating abroad in 1974, and is organized as follows. The next section provides the theoretical framework for the study. In section 3 the data and the statistical model are described. Section 4 presents the empirical results, and, finally, section 5 concludes the study.

2. Theoretical Framework

Theory suggests that in order to compete successfully in a foreign

market, a firm must possess some ownership specific assets in knowledge, technology, organization, managerial and marketing skill. A firm blessed with such assets enjoys several possible ways (apart from exporting) to claim the rents that they will yield in foreign markets, including subsidiary production, joint ventures, licensing, franchising, management contracts, marketing contracts and turnkey contracts. Of these, subsidiary production and joint ventures involve varying degrees of equity participation, while the others represent arm's-length transactions in the market for technologies and other skills.

Technology and similar rent-yielding assets can normally be transferred more efficiencly and cheaper within a firm than between independent firms. In fact, multinational firms often find it very difficult, or sometimes impossible, to earn the same rent on their intangibles in foreign markets in forms other than through the establishment of an affiliate abroad. However, affiliate production is not without costs. It involves the commitment of both capital and managerial resources, the costs of which must, of course, be considered by the firm in its choice of how to exploit a foreign market.

According to Caves (1982), a firm's organizational choice is located along a continuum, where the relative advantages and disadvantages of subsidiary production, joint ventures and non-equity participation determine where one stops and the other starts. This approach suggests several important determinants of the level of equity ownership in the foreign affiliates.

The nature of the multinationals' intangible assets seems to be an

important aspect, since such assets enable firms to operate efficiently in foreign countries where local firms have certain advantages (such as knowledge of consumer and factor markets). In order to limit the diffusion or spillover of such intangible assets, we expect technology and marketing oriented multinationals to be more unwilling to share information, and to insist on full control or majority-ownership of their foreign affiliates, since both product and process technologies are generally considered to be important intangible assets.

Multinationals with a lot of experience of foreign operations are also likely to exploit their rent-yielding assets by internalizing their production abroad. "Learning by doing" occurs in international technology transfers, in the sense that the transfer costs decrease with the number of transfers (see Teece, 1976). Furthermore, uncertainty levels decline as the firms become more familiar with international operations in general, and with their individual markets in particular (Davidson, 1980). This reduction should affect decisons regarding organizational choices.

On the other hand, there are several factors that may encourage multinationals to seek out joint ventures. For example, the economic environment may be unfamiliar to the multinational firm and, therefore, it may find advantageous to take on a host country firm as a partner. A local firm may bring the joint venture some intangible assets of its own, such as knowledge of local marketing and production conditions.

Another reason for equity sharing and non-equity forms of involvment has to do with risk aversion. If a project is risky -- which many projects in the developing countries undoubtedly are -- the multinational may wish

to shift some of the risks to firms in the host country, or to other multinationals. The same argument holds when the project is large in relation to the investing firm, something which is particularly common in extractive industries. Equity sharing can therefore be expected when foreign projects are risky or big. Minority-ownership is also more likely when the subsidiary's output is diversified from the parent's (Stopford and Wells, 1972).

Finally, some characteristics of the host country may influence the forms of international activities undertaken by the multinationals, one of them being the size of the host country market. It may be difficult for a multinational firm to enter a large foreign market on its own, if such an investment requires a lot of resources for local sales networks, after sales services, and so forth. This should be of particular importance if the MNC is based in a small country like Sweden, because we know that Swedish firms are typically smaller when they venture abroad for the first time than are firms from, for instance, the United States (Swedenborg, 1979). Thus, we expect that joint ventures become more prevalent as multinationals proceed towards larger host countries, other things being equal.

The willingness of MNCs to seek joint ventures should also be influenced by the extent to which the host country can provide specific resources that are of interest for the multinationals. The higher the income level of the host country, the more likely that the local partner possesses technology, capital, and knowledge about local marketing.

3. Data and Statistical Model

The data for this study come from the Industriens Utredningsinstitut

(IUI) of Stockholm, supplemented by official GDP and GNP per capita figures from the United Nations. The IUI has completed four surveys of Swedish multinationals (1965, 1970, 1974 and 1978), which cover virtually all Swedish manufacturing firms operating abroad (see Swedenborg, 1979 and 1982, for a description of the data). We use the 1974 survey, mainly because it covers more details on the minority-owned affiliates than the other surveys do. Another reason for going back to the early 1970s is that many host countries (particularly developing countries) had not yet begun to demand local equity participation.[1] Thus, the 1974 survey is better suited for our purposes, which is to isolate the factors causing firms to seek out joint ventures.

In the data, it can be observed whether the foreign affiliates are majority-owned or not. Labeling this characteristic as one in the case of a majority-owned affiliate, and zero otherwise, we obtain a dichotomous dependent variable which requires an appropriate statistical technique.

We postulate the existence of a continuous variable y^*, linearly dependent on a vector of explanatory variables X -- corresponding to a set of parent company, affiliate and host country attributes -- with a vector of parameters β. That is,

$$Y^* = X'\beta$$

The variable y^* could be interpreted as an index of the utility that majority ownership generates to the parent company. When the index is positive, the parent chooses a majority ownership strategy.

We cannot observe y^*, but we assume that there is a certain threshold value (we can assume this threshold to be zero without loss of generality),

such that y^* is greater than the threshold value for majority-owned subsidiaries.

On the other hand, we do observe the outcome of this process, i.e. if a subsidiary is majority-owned or not. Labeling the event "majority-owned" with one and "minority-owned" with zero, we get a proxy variable for y^*. We assume that the probability of a given subsidiary to be majority-owned is given by

$$p(y^* > 0) = p\ (y=1) = F\ (X'\beta)$$

where $F(\cdot)$ is the standard normal cumulative distribution function. This case is known as the probit model, and maximum likelihood estimates can easily be computed.

The explanatory variables for the model were suggested in the previous discussion in Section 2. One by one they are:

RD = R&D expenditures as per cent of sales for the parent firm. We expect technologically oriented multinationals to insist on control and, thus, the probability for majority ownership to increase with the R&D expenditures.[2]

YEARS = The age of a multinational firm's oldest foreign manufacturing affiliate (in log), as a measure of "experience" of producing abroad.[3] The more experience a firm has of foreign production, the less tolerant we expect it to be towards equity-sharing.[4]

DIV = A dummy variable taking the value one if an affiliate belongs to a different 2-digit industry from its parent company's principal

one, and zero otherwise. If an affiliate's output is a different industry from the parent's, minority-ownership is expected to be more likely.

MIX = One minus a Herfindahl index of the distribution (over 6-digit industries) of a firm's industrial activities, as calculated by Swedenborg (1979).[5] MIX equals zero if a firm produces only one product, and one if it produces an endless number of products. A high value of this index is, thus, supposed to reflect a high degree of product diversification, which in turn is expected to result in more tolerance towards minority ownership.

SIZE = The size of the parent firm, measured by its world wide sales. We expect larger firms to be able to take higher risks in the form of majority-owned subsidiaries.

GDP = Host countries' GDP in 1974, as a measure of market size. The larger the host country market, the more resources needed for a successful entry. Thus, we expect the likelihood of equity sharing to increase with the size of the market.

GNPC = Host countries' GNP per capita in 1974, as a measure of income level. The income level is supposed to capture the extent to which the host country firms can bring a joint venture certain intangible assets of their own. Thus, we expect the probability for joint venture agreements to increase with the level of income in the host country.[6]

4. The Empirical Results

The probit model was estimated, using the maximum likelihood method, first with data on all the 50 host countries of Swedish MNCs, and then for 23 developed countries and the 27 developing countries, separately. The reason for the separation of the data is that the status of being a developed country may have some meaning beyond per capita income (e.g. the investment risks may be lower). The main findings from these estimations are shown in Table 1 and Table 2 (see Appendix for correlation matrices).

The results seem to confirm most of our prior expectations regarding the determinants of the patterns of ownership of the MNC affiliates. The importance of capacity and competence as an underlying reason for ownership sharing is certainly suggested by the performance of the variables YEARS, MIX and DIV. The YEAR variable consistently performed well, with the expected positive sign. In other words, firms that have been in international business for a long time seem to become more experienced and interested in exploiting their rent-yielding assets in majority-owned affiliates. The variables MIX and DIV had, as expected, negative signs in front of their coefficients, although they were not always significantly different from zero. Still, the result suggests that MNCs that are diversifying in product (MIX) seem to find advantageous to take on a domestic firm as a partner. The same seems to be the case if an affiliate's output is diversified from the parent's (DIV). In both these cases, the parent may lack capacity or competence for majority-ownership of their foreign affiliates.

The same argument should, of course, hold for the size variable as

well.[7] We expect larger parent companies to have more resources of various kinds and, thus, to be able to take higher risks, but SIZE turned out strongly negative. In other words, the probability of ownership sharing seems to increas with the size of the parent company but we have no explanation for this paradoxical result.

Another result that deserves a comment is the insignificance of the R&D variable, particularly since it has been shown elsewhere that ownership sharing in high-tech industries is rare (see Lipsey, 1984). The explanation for this finding can have to do with the construction of the dependent variable. The most technologically oriented firms may not accept any ownership sharing at all, while firms that are less, but still dependent on their proprietary technology, may accept only limited joint participation (less than 50 per cent) in foreign ventures. If this is the case, the R&D variable should have come out significant with another dependent variable (e.g. 100 per cent ownership vs. less than 100), but unfortunately we could not test for this.

Finally, the performance of the two host country variables adds some interesting information to the problem at hand. The size of a host country-market (GDP) seems to be an important determinant of different patterns of ownership of foreign affiliates only in the developed countries. The likelihood of equity sharing, thus, seems to increase with the size of the host country market, but only after the market has reached a certain size. However, in contrast to previous studies, using small samples of firms or host countries, the income level variable (GNPC) turns out significant only in the regressions with data on the developing countries, and

with an unexpected positive sign. The income level may, therefore, not be a very good proxy for the comparative advantages of the local partners. Instead, it seems to reflect demand conditions in the host economies.

Earlier work have also suggested the importance of the distinction between export-oriented and local-market affiliates. It has, for instance, been shown that MNCs hold significantly higher fractions of equity in export-oriented affiliates than in local market oriented ones (Reuber, et al., 1973). Unfortunately we can not test for this in our study, since we do not have any export data for the minority-owned affiliates.

It has also been suggested that joint-venture participation of MNCs varies with their national origin (see e.g. Vernon, 1977). Multinationals from other (i.e. smaller) countries than the United States are supposed to be more willing to share ownership. Of course, we can not test this hypothesis here, but it is worth noting that Blomström (1987) found that Swedish firms had lower proportion of foreign direct investment held in the forms of minority ventures that U.S. multinationals. From this, he concluded that one should look for explanations to openness for ownership sharing in factors such as the age, size and the differences in activities undertaken by the firms, rather than in their national origin.

5. Concluding Remarks

The particular concern of this paper has been to investigate what determines multinational firms to enter into minority venture agreements rather than to invest in majority-owned affiliates. Comprehensive firm-level data, covering almost the entire population of Swedish multina-

tionals, have been used in a model of dichotomous choice, where the firms can choose between majority ownership or minority ownership of their foreign affiliates. The results suggest that this choice is strongly influenced by the firms' capacity and competence. Firms with brief experience of foreign production and highly diversified product lines turned out to be the most likely to choose minority ventures. There was also some support for the hypothesis that multinationals choose minority-ownership for affiliates producing different (2-digit) output than their parents.

Also the size of the host country market turned out to be an important determinant for the firms' choice. However, the likelihood of equity sharing seems to increase with the size of the host country market only when it has reached a certain size, judging from the fact that the variable was not significant in separate regressions on developing countries.

Our findings are of interest for the current debate on transfer of technology to developing countries. The flood of literature analyzing the costs of such transfers by multinational corporations sometime claims that the developing countries, which are often in a weak bargaining position vis-á-vis the multinationals, are buying their technology too expensively. However, to be able to judge whether or not the developing countries really pay "too much" for their technology, it is necessary to know whether there exist alternative ways of getting a certain technology. Our study suggests that such alternatives may not always be available, since the multinational firms that seek out joint ventures appear to be the diversified ones and those that pursue diversifying strategies. This, in turn, suggests that a

tighter control of technology transfer, for example, in the form of insistence on ownership sharing, may prevent the inflow of advanced technologies.

Footnotes

[1]For example, India introduced its Foreign Exchange Regulation Act in 1973, which places a 40 per cent ceiling on foreign equity participation (with some exceptions). In Malaysia, the Industrial Co-ordination Act of 1975 requires all manufacturers to apply for licences to start or continue operations. In some Latin American countries various regulation policies are of an older date. In Mexico, for example, some legislation has been in force since 1944, but it was not until The Law to Promote Mexican Investment and to Regulate Foreign Investment, which came in 1973, that majority Mexican ownership in all foreign ventures was required. The law has been applied mainly to firms starting up after 1973.

[2]It was not possible to analyze whether other rent-yielding assets, such as managerial and marketing skills, were of importance or not, since data were not available. An interesting additional variable would have been advertising expenditures, but no such information has been collected for Swedish MNCs.

[3]It seems realistic to assume that firms gain more experience in the first year of operation than in, say, the 15th, but that they always gain something. This is why we use this variable in its logarithmic form.

[4]An alternative measure of experience, defined as the parents' number of foreign affiliates (also in log), was tried, but it did not change the results in any significant way.

[5]
$$MIX = 1 - \frac{\sum_i^n x_i^2}{(\sum_i^n x_i)^2} \; ; \quad 0 \leq MIX \leq 1$$

where x_i is a firm's output in industry i.

[6]Here we assume that all joint ventures are with host-country firms. They could, of course, be with other investors, but the data do not shoe who the parters are.

[7]A dummy variable equal to one if an affiliate belonged to natural resource intensive industries, and zero otherwise, was also tried, to take care of generally risky and big projects in extractive industries. Since it never turned out significant it is not shown in the tables.

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APPENDIX

Simple Correlation Coefficients for Independent Variables

	RD	YEARS	DIV	MIX	SIZE	GDP
			All Host Countries			
RD	1.00					
YEARS	.348	1.00				
DIV	-.107	.089	1.00			
MIX	-.054	.427	.405	1.00		
SIZE	.245	.317	-.026	.143	1.00	
GDP	.058	.092	.033	.094	-.051	1.00
GDPC	-.051	-.138	.064	.024	-.092	.371
			Developed Countries			
RD	1.00					
YEARS	.357	1.00				
DIV	-.099	.094	1.00			
MIX	-.012	.453	.424	1.00		
SIZE	.222	.336	-.027	.206	1.00	
GDP	.086	.143	.036	.113	-.020	1.00
GDPC	.025	.027	.072	.081	.062	.356
			Developing Countries			
RD	1.00					
YEARS	.226	1.00				
DIV	-.149	.068	1.00			
MIX	-.292	.264	.324	1.00		
SIZE	.273	.101	-.035	-.126	1.00	
GDP	.042	.093	-.173	-.121	-.069	1.00
GDPC	.211	.125	.022	-.035	.062	-.101

Table 1

Regression Results for the Determinants of Majority Ownership in Affiliates of Swedish Multinationals in 1974

Explanatory Variables	All Countries (497 Observations) Probit $\hat{\beta}$
Intercept	1.22*** (3.53)
RD	-2.21 (.54)
YEARS	2.87 E-01*** (2.98)
DIV	-2.52 E-01* (1.62)
MIX	-1.21*** (2.85)
SIZE	-3.83 E-05*** (5.81)
GDP	-5.05 E-07** (2.32)
GNPC	7.49 E-05** (1.94)
Wrong predictions as % of total observations	16.6
Wrong predictions of majority-ownership (%)	.96

t-statistics

*** significant at the 1 per cent level
** significant at the 5 per cent level
* significant at the 10 per cent level

Table 2

Regression Results for the Determinants of Majority Ownership in Affiliates of Swedish Multinationals in Developed and Developing Countries, 1974

Explanatory Variables	Developed Countries (403 observations) Probit $\hat{\beta}$	Developing Countries (94 observations) Probit $\hat{\beta}$
Intercept	1.64***	-5.68 E-01
	(3.56)	(.64)
RD	-2.37	-6.88
	(.52)	(.71)
YEARS	2.50 E-01**	5.77 E-01**
	(2.37)	(2.17)
DIV	-1.93 E-01	-5.39 E-01
	(1.09)	(1.54)
MIX	-1.32***	-8.60 E-01
	(4.00)	(.88)
SIZE	-3.81 E-05***	-3.84 E-05***
	(4.00)	(2.71)
GDP	-4.23 E-07**	-1.04 E-06
	(1.90)	(.29)
GNPC	2.05 E-05	9.65 E-04***
	(.31)	(2.74)
Wrong predictions as % of total observations	14.9	20.0
Wrong predictions of majority-ownership (%)	.29	4.1

t-statistics in parenthesis

*** significant at the 1 per cent level
** significant at the 5 per cent level
* significant at the 10 per cent level