

OWNERSHIP STRUCTURES OF FOREIGN SUBSIDIARIES

Theory and Evidence

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This paper explains how multinational enterprises (MNEs) select ownership structures for their foreign manufacturing subsidiaries. It extends the literature on the economics of the MNE and provides new statistical tests of its theoretical predictions. MNEs are found to prefer a joint venture with a host-country firm over a wholly owned subsidiary when: (1) the capabilities of the local firm complement those of the MNE; (2) the contributions of both firms are costlier to transfer contractually than through ownership channels, and (3) costs due to shirking by partners and conflicts between them do not outweigh the benefits of joint ownership.

1. Introduction

This issue of ownership of foreign operations is central to any theory of the multinational enterprise (MNE). The broad question of why MNEs own and control operations abroad has been addressed successfully by a number of authors using transaction cost arguments [original statement is in Buckley and Casson (1976); a recent review is in Teece (1986a)]. The narrower question of how transaction costs affect the choice of ownership structure of foreign subsidiaries has received much less attention [but see Hennart (1988); Anderson and Gatignon (1986)]. Yet a complete theory of the MNE must explain why a firm would form a wholly owned foreign subsidiary in one case, and an equity joint venture with a local partner in another. In addition, because joint ventures have been considered an 'intermediate' form between licensing and whole ownership [Teece (1986a)], a detailed study of MNEs' ownership choices may throw additional light on the transaction cost approach to MNE behavior.

Various studies on the topic suggest that the costs and benefits of different ownership structures depend on three types of factors. The first is the

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motivation for cooperation, or what Stopford and Wells (1972) called the MNE's 'need for resources'. The second is the *transaction costs* of cooperating through contractual means [Gomes-Casseres (1985); Hennart (1988); Buckley and Casson (1988)]. The third is the *organizational costs* of equity joint ventures, stemming in part from what Stopford and Wells called the MNE's 'need for control'. These three types of factors are reflected implicitly in a number of early empirical studies [Friedmann and Kalmanoff (1961); Tomlinson (1970)], and more explicitly in recent studies of joint venture use in resource-based industries, such as Stuckey (1983).

This paper extends the literature by developing a comprehensive model incorporating these three types of factors (sections 3–5), and testing some of its predictions on data from over 1,500 manufacturing subsidiaries of 180 U.S. MNEs (section 6). It provides new support for the transaction cost approach to MNE behavior, but also emphasizes the need to incorporate organizational costs and strategic motivation in our models of foreign direct investment.

2. The context of ownership choices

The process by which an MNE chooses the ownership structure of a subsidiary can be divided into two stages: (1) determination of the firm's preference; and (2) entry negotiations with host governments. Thus, where host governments attempt to influence ownership choices of foreign subsidiaries, the actual structure chosen depends on a combination of these two processes. Tests of an integrated model appear in Gomes-Casseres (1988b). Here I will deal only with the first stage, and will thus assume that there are no host government constraints on the firm's ownership choices. (The statistical tests control for the impact of such constraints.)

In determining the preferred ownership structure for a subsidiary, the MNE is assumed to maximize expected net economic benefits, which vary with the ownership structure chosen, as shown below. The basic choice examined here is between a wholly owned venture and one that is owned jointly with one or a limited number of host-country firms or individuals.¹ In this context, an equity joint venture is only one way to organize cooperation between an MNE and a local firm – it represents cooperation through ownership channels. Such cooperation is subject to costs of negotiating, monitoring, and enforcing agreements between the MNE and a potential local partner; these costs vary with the nature of the relationships between the parties, as has been established in the transaction cost literature.

In general terms, the choice of ownership structure for a subsidiary

¹The analysis ignores joint ventures between two MNEs, as well as MNE subsidiaries with widely dispersed local ownership. The great majority of joint ventures in the data used here were, in fact, between an MNE and one local partner.

depends on an MNE's strategy and on the costs of different ways to implement this. MNE strategies can involve varying degrees of adaptation to circumstances in the host country. The behavior modeled here is a subset of the whole in that it assumes that a certain amount of host-country tailoring will be done. The question then becomes how best to implement this – with or without a local partner.² The model also holds one other strategic variable constant. It assumes that foreign production is preferable to servicing the foreign market through exports, one of the three necessary conditions for direct foreign investment [Dunning (1981); Teece (1986a); Ethier (1986)]. Since the choice considered here is between whole and joint ownership of a manufacturing subsidiary,³ the need for foreign production can be presumed to exist.

The choice of ownership structure revolves around three issues. First, how strong is the motivation for cooperation, and what resources need to be transferred by and/or to the MNE? Second, what are the transaction costs of transferring these resources, and which channels – contractual or ownership – are optimal for these transfers? Third, what are the organizational costs of an equity joint venture, and do they outweigh the benefits of cooperation through ownership channels? Each of these issues is examined separately below.

3. Cooperation: Combining firm capabilities

The attractiveness of a joint venture as compared to a wholly owned subsidiary depends partly on the costs and benefits of cooperation between the MNE and a local firm. These costs and benefits, in turn, depend on the nature and the form of cooperation considered. The effect of the *form* of cooperation is examined below (sections 4 and 5). For now, assume that only least-cost organizational forms are evaluated, and consider the question: does cooperation between the MNE and a local firm yield greater net benefits than the sum of two separate ventures?

The answer to this question depends on whether the MNE has all the capabilities required by its strategy for the subsidiary. If not, and if the local firm can provide the missing capabilities, then cooperation may be attractive. In that case, both the MNE and the local firm will need to transfer some of their capabilities to the cooperative venture.⁴ Because the costs of these transfers depend on the nature of the transactions, a careful examination of the potential contributions of both MNEs and local firms is in order.

²I am indebted to Donald Lessard for emphasizing the role of strategy in framing the question examined here.

³Note that the term 'subsidiary' as used in this paper does not imply whole ownership; it is simply a foreign operation that is at least partly owned by the MNE.

⁴This differs from the situation described in most of the literature on foreign direct investment where only the MNE transfers firm-specific advantages to the foreign subsidiary.

A firm's capabilities are the corporate skills, resources, and scope that yield competitive advantage in the marketplace.⁵ Five types of capabilities highlighted by previous studies are considered here. In each case, the capabilities of MNEs and local firms can be expected to differ systematically. Because of these differences, cooperation between the MNE and a local firm may be attractive. The empirical analysis that follows (section 6) estimates the effect on ownership preferences of each of these capabilities.

The first type of capability relevant to the ownership issue is *geographic experience*. Local firms are likely to have more experience in their home markets than MNEs. Not only will they be more familiar with local customs, but exclusive economic elites and business groups may provide them with a network of connections that MNEs would find hard to penetrate. Still, MNEs can be expected to be more familiar with some countries than with others [Davidson (1980)]. An index of how familiar U.S. MNEs were with particular host countries is used below to measure their geographic experience.

MNEs are likely to have an edge over most local firms in the second category of skills, *industry experience*. It has been widely argued that MNEs use industry-specific skills developed in their worldwide operations to overcome their geographic inexperience vis-à-vis local competitors [Vernon (1966); Caves (1971); Galbraith and Kay (1986)]. This factor is measured below by the number of investments that the MNE had in an industry and by an indicator of whether or not the subsidiary was in the MNE's main line of business. Local firms in large, industrialized countries may be expected to have significant industry experience, perhaps matching that of U.S. MNEs. The size of the host country's industrial sector is therefore used below as a proxy for the experience of local firms.

Firms having exclusive or *privileged access to markets or inputs* due to vertical integration may be said to have a third type of organizational capability. While it is hard to generalize about differences between MNEs and local firms on this account, systematic patterns can be expected in some industries. Local firms may have an edge in raw material processing industries because host governments often reserve for locals the mining and agricultural operations that may be vertically integrated with processing. In the empirical tests, a special industry classification is used to measure this effect. On the other hand, MNEs may control export markets for some intermediate and finished goods. This will be measured below by the share of the subsidiary's output sold to other units of the MNE's system.

Marketing skills, the fourth group of organizational capabilities, is often the basis for the industry-specific advantages of U.S. MNEs. While local

⁵Hennart (1988) points out that only such 'firm-specific advantages' can provide a rationale for interfirm cooperation, as otherwise one firm could buy the relevant capability on the market.

firms can be expected to have more intimate knowledge of local customs, U.S. MNEs are likely to be more experienced in using mass advertising, in product packaging and promotion, and in sales force management [Horst (1974)]. In the tests below, a measure of the marketing intensity of the subsidiary's business is used to examine the impact of these factors.

The industry-specific advantages of MNEs may also depend on their *mastery of key technologies*, which may be considered a fifth set of firm capabilities [Vernon (1966); Mansfield, Romeo and Wagner (1979); Magee (1977)]. Although the technological advantages of MNEs are often associated with proprietary technologies, what is critical is their organizational skill in developing new technologies [Vernon (1970)], and their ability to make effective use of technological knowledge. Here again, only firms in large, industrialized countries can be expected to have capabilities close to those of U.S. MNEs. In the empirical tests, measures of the research intensity of the subsidiary's businesses are used to evaluate the effects of this factor.

The differing capabilities of MNEs and local firms provide a basis for cooperation between them.⁶ When local firms can supply capabilities needed by the MNE, a cooperative venture becomes attractive. This requires that both the MNE and the local firm transfer some capabilities to the cooperative venture. Transaction costs will then determine whether ownership or contractual channels are chosen for these transfers, as discussed next.

4. Channels for transferring firm capabilities

Assuming a subsidiary strategy where cooperation between two firms is attractive, the optimal form of a cooperative venture would minimize the transaction costs of transferring the capabilities of each firm to the venture. As is well established in the literature, the transaction costs of using contractual or ownership channels for such transfers will vary according to the nature of the transfer. Contractual channels are likely to be costlier than ownership when: (1) the organizational knowledge being transferred is of a tacit nature and is embodied in managerial routines [Alchian and Demsetz (1972); Teece (1981); Nelson and Winter (1982)]; (2) the transfer is likely to require exchange of personnel and responses to contingencies that are difficult to predict in advance [Williamson (1975, 1979, 1981); Teece (1981)]; (3) there exists the potential for externalities that affect the remaining operations of the donor firm [Williamson (1981)]; and (4) the firms need to

⁶For a general discussion of how differences rather than commonalities between firms form the basis for cooperation, see Lax and Sebenius (1986, pp. 90-106). Hennart (1988) suggests that some joint ventures exploit scale economies by combining *similar* assets of two firms. But even here, one firm often has some marketing or financial capability that the other lacks, and without which the other firm could not expand capacity unilaterally.

Table 1

Combined effects of potential for cooperation and transaction costs on ownership structures.

Benefits to cooperation	Best channel for MNE's contribution	Best channel for local's contribution	Predicted ownership structure
No	Ownership	None	100% MNE
No	None	Ownership	100% local
Yes	Ownership	Contracts	100% MNE
Yes	Contracts	Ownership	100% local
Yes	Ownership	Ownership	Joint venture*

*Provided that joint ownership does not create shirking costs and conflicts of interest that outweigh the benefits of using ownership channels for both firms' contributions (see section 5).

make investments in assets that are specific to the relationship [Klein, Crawford and Alchian (1978); Williamson (1975, 1982)]. If the transfers of either the MNE or the local firm are characterized by one or more of these conditions, it will be cheaper for that firm to own a share of the cooperative venture than to transfer its capabilities through contracts.

In fact, these conditions are likely to be important in the transfer of each of the five types of firm capabilities described above (section 3). Both industry and geographic experience can be considered tacit knowledge that is embodied in managerial routines, and their transfer is likely to require personnel exchanges and responses to unforeseen contingencies. The same is true for technological and marketing skills, but here externalities too play an important role, as these skills create monopolistic advantages that may be eroded through uncontrolled transfers. Finally, providing a cooperative venture privileged access to markets or inputs usually would require that the venture invest in assets specific to the relationship. The effects on ownership patterns of these transaction costs are evaluated in the empirical work below (section 6).

According to these arguments, when *both* the MNE and the local firm contribute capabilities to the cooperative venture that are costly to transfer through contracts, both of them should own a share in the cooperative unit. The result, as shown in table 1, would be a joint venture. But, in this situation the venture is not fully owned by each firm – its ownership is *shared* between them. This sharing of ownership creates an additional series of organizational costs, as discussed next. Only if these costs do not outweigh the above-mentioned benefits of cooperation through joint ownership will a joint venture be optimal.

5. Costs of sharing equity

The organizational costs inherent in joint ventures stem from: (1) shirking due to each firm having only partial ownership in the cooperative venture; and (2) management conflicts heightened by the firms' shared control of the venture.

5.1. *Shirking*

One problem with partial ownership is simply that the incentives for the firm to contribute all that the venture needs are not as strong as when it has full ownership [Jensen and Meckling (1976); Alchian and Demsetz (1972)]. Such shirking tends to be most severe when the transaction costs of contractual transfers are relatively high. Empirical studies have shown that MNEs in fact contribute less complete technological packages to joint ventures than they do to their wholly owned subsidiaries [Davies (1977)]. One particularly damaging form of shirking occurs when one party reneges on agreements to guard against leakage of sensitive information. One partner may, for example, use proprietary information acquired from the other partner in its own wholly owned operations, thus hurting the joint venture and the other partner.

Because joint ventures by definition involve partial ownership, some shirking is inevitable. The net benefits of cooperation through a joint venture thus depend on the costs of the different transfer channels after an adjustment for shirking. The balance between costs from shirking and benefits from cooperation through ownership channels depends on three factors: (1) the comparative capabilities of the partners; (2) whose contribution is most costly to transfer contractually; and (3) whose contribution is most critical to the venture [Eswaran and Kotwal (1985); Grossman and Hart (1986)]. If the extent of shirking is small compared to the benefit of cooperating through ownership channels, joint ventures will be attractive compared to other organizational forms. But if the shirking is so severe that it nullifies the benefits of using ownership channels for one firm's contribution, a venture owned fully by the other party may be more attractive. Unfortunately, only limited data were available to test these propositions in the empirical work below (section 6).

5.2. *Managerial conflicts*

Another cost inherent in joint ventures stems from conflicts of interest between the partners. Rather than promoting cooperation, a joint venture may well institutionalize such conflicts, making agreements about the venture's management difficult or costly to achieve.

Conflicts typically arise whenever the costs and benefits as perceived by

the joint venture differ from those as perceived by either of the partners, i.e. when there are negative or positive 'spillover effects' [Stopford and Wells (1972); Hladik (1985)]. In particular, the actions of the joint venture may affect the MNE's operations in other countries, while having no such external effect on the local partner's operations. Such conflicts can be expected, for example, when the joint venture exports to markets of other MNE subsidiaries, when the MNE's worldwide quality standards exceed those of the local partner, and when either the MNE or the local partner buys outputs from or sells inputs to the joint venture.

When such conflicts appear, joint management becomes costly [Gomes-Casseres (1989)]. The costs arise either in the form of lost worldwide profits, or from the time and resources spent 'convincing' the partner to act otherwise. For the MNE, therefore, it may be cheaper to maintain full ownership of the venture, while acquiring the local partner's capabilities through a contract. The costs of negotiating, monitoring, and enforcing such a contract may be less than the costs of managing a joint venture when there are conflicts between the partners. These hypotheses are tested below (section 6) using variables that measure the nature of the subsidiary's business and the extent of its sales to other units of the MNEs system.

5.3. Acquisitions versus joint venture

There exists another solution to this dilemma. When the costs of a joint venture are high, but the benefits of cooperation through ownership are still significant, firms may choose to merge instead. But this creates additional costs because a much larger organization is created than if only selected operations were combined in a free-standing joint venture. As a result, there may be diseconomies to such mergers if the activity that benefits from cooperation between the two firms is only a small part of their overall operations [Teece (1986b)].

The positions of MNEs and local firms are likely to differ significantly in this regard. A manufacturing operation in a new market is usually only a small part of the activities of the MNE. But the industry and geographic scopes of local firms are much narrower, so that cooperation with the MNE subsidiary may well involve a large part of their activities. As a result, one alternative to a greenfield joint venture between the MNE and local firm is complete acquisition of the local firm by the MNE.

Acquisitions are in fact a common form of market entry by U.S. MNEs. Like joint ventures, entry by acquisition tends to occur in situations where the MNE needs capabilities from a local firm. For example, MNEs that needed product and country experience were more likely to enter new markets by acquisitions than others [Dubin (1976); Gomes-Casseres (1985);

Caves and Mehra (1986)]. In these cases, therefore, acquisitions were alternatives to joint venture.

But entry by acquisition may also result in a joint venture, such as when the MNE buys only part of the equity of the local firm [Stopford and Wells (1972); Gomes-Casseres (1985)]. The decision of whether or not to leave local owners with a share of the equity is again likely to depend on costs of contracting and of managerial shirking. When the contribution needed from the local firm depends on continued long-term commitment by its owners, a joint venture is more likely than a full acquisition. The same is likely to occur when the desirable capabilities of the local firm depend on continued access to officials, contacts with business groups, and so on. Empirical evidence not presented here tends to support these hypotheses [Gomes-Casseres (1985)].

6. Tests of the theory

Substantial statistical evidence supports the arguments made above. The model predicts that MNEs are likely to prefer jointly over wholly owned ventures when three conditions apply: (1) they need the contribution of a local firm to compete successfully; (2) there are significant costs to the contractual transfer of the local firm's capabilities; and (3) the potential benefits from joint ownership are not outweighed by costs of shirking and of conflicts of interest between partners. These three propositions led to a number of specific tests discussed below.⁷

The dependent variable in these tests was a binomial variable measuring whether an individual MNE subsidiary was organized as a jointly or a wholly owned venture. There were two types of independent variables. The first measured characteristics of the subsidiary's business. These characteristics affect the transaction costs of transferring the capabilities needed by the subsidiary, and at times the potential for conflict between joint venture partners. The second type of variable measured the relative capabilities of the MNE parent and the host country's local firms, and thus whether or not the MNE needed the capabilities of the local firms.

6.1. Sources of data

The tests presented here were based on data from a number of sources. Information on individual subsidiaries (ownership structure, host country, and main products) and on their MNE parents came from Harvard's

⁷A fourth requirement, namely that the MNE's contribution also be costly to transfer contractually, is not tested below because no data were available on licensing. Since the MNE owned some equity in each subsidiary in the sample, the presumption of high transaction costs for such contributions exists in each case.

Multinational Enterprise Project. Over a period of ten years, detailed data on almost 20,000 subsidiaries of the 187 largest U.S. MNEs were collected through questionnaires, interviews, and library research. The subsidiaries in this database accounted for about three-quarters of the sales of all U.S.-owned foreign subsidiaries in 1975 [Curhan, Davidson and Suri (1977)].

These data were supplemented with information from other sources. The nature of each subsidiary's business was characterized by measures derived from the PIMS database. These data contain information on operations of some 2,000 strategic business units of about 200 large U.S. firms, also collected by questionnaires and interviews [SPI (1984); Schoeffler, Buzzell and Heany (1974); Clark (1984)]. Average industry characteristics for U.S. operations in these data were calculated at the 4-digit SIC level and merged with the Harvard data on the foreign subsidiaries. These averages thus represented proxies for the nature of the subsidiaries' businesses.

The subsidiary data were also augmented with information on the host countries. The size of the host country's industrial sector was used as a proxy for the level of development of local firms, as discussed below. This measure was derived from World Bank statistics [World Bank (1978)]. A measure of how familiar U.S. MNEs were with individual host countries was constructed from Davidson (1980). Finally, indicators of whether or not a host country restricted foreign ownership were derived from surveys by the U.S. Department of Commerce (1981) and from Stopford and Wells (1972). Further details of how these variables were derived and merged with the subsidiary information are in Gomes-Casseres (1985).

The data used here included only subsidiaries active in 1975,⁸ and that manufactured at least one product; there were over 5,000 such subsidiaries in 1975. After merging and excluding observations with missing data, 1,532 observations were left. But this smaller sample was highly representative of the larger set. While the observations were somewhat concentrated in a number of countries (e.g., Canada, U.K., West Germany, France and Brazil) and industries (e.g., pharmaceuticals, toiletries, tires, industrial chemicals, and motor vehicles), separate tests showed that this did not bias the results.

Subsidiaries in six countries with extremely restrictive foreign ownership policies were excluded from the analysis (Japan, India, Mexico, Pakistan, Spain and Sri Lanka).⁹ MNEs investing in these countries were usually forced to accept joint ventures [Stopford and Wells (1972)], so that these observations could not be used to ascertain the MNEs' preferences. A

⁸The dependent variable measures ownership structure in 1975, which may differ from the structure at entry [see Gomes-Casseres (1987)]. While no statistical data were available for later years, 1985 interviews in five U.S. MNEs broadly confirmed the conclusions of the analysis [see Gomes-Casseres (1985)].

⁹Separate tests with a dummy variable for these countries showed that excluding them from the analysis did not bias the results presented here [Gomes-Casseres (1985)].

number of other host countries also encouraged joint ventures, but not to the exclusion of wholly owned ventures. These countries were included in the analysis, with a dummy variable to control for the effect of the policies, as discussed below.

6.2. *Methods of analysis*

Because the dependent variable (defined below) was dichotomous, binomial logit analysis was used. In this model, the effects of the independent variables are assumed to be linear in the logarithm of the odds that the dependent variable is equal to one. The one-tailed significance levels of the estimated effects reported below represent the probabilities that the true effects have signs opposite of those of the estimates. The standardized beta coefficients reported give the estimated amount, in standard deviations, that the dependent variable changes for one standard deviation change in the independent variable. In a number of cases, linear interactions between variables were estimated; these can be interpreted much as they are in ordinary least square regressions. In addition, it was often useful in the discussion to express the impacts of the independent variables in terms of their multiplicative effects on the odds of a joint venture.

The results of the logit analyses are presented in table 2. The definition of each variable is given in the text, together with the variable's source, mean, and standard deviation (sd). Each definition is followed by discussion of corresponding hypotheses and results. There were no substantial correlations between independent variables that might create multicollinearity problems.

6.2.1. *Dependent variable*

The dependent variable was defined as follows:

MNE OWNS <95% Dummy variable equal to 1 if the parent MNE owned less than 95% of the subsidiary's equity in 1975. From Harvard MNE database. (mean = 0.24; sd = 0.42).

This definition is the same as that used by previous studies on the topic [Franko (1971); Stopford and Wells (1972)]. Separate tests with another dependent variable using a 50%-of-equity cut-off point yielded substantially the same results [Gomes-Casseres (1985)]. Thus, because of the methods used here, the regression coefficients estimate the effects of the independent variables on the odds that local partners owned more than 5% of a subsidiary's equity.¹⁰

¹⁰ As explained in section 2, joint ventures not involving a local partner, such as between two MNEs in a third country, were excluded. There were few such ventures.

Table 2

Logit analyses: Effects of firm, country, and industry variables on probability that subsidiary is a joint venture (beta coefficients with standard errors in parentheses) $N = 1,532$.

Independent variables	Dependent variable: MNE OWNS < 95%			
	(2.1)	(2.2)	(2.3)	(2.4)
MNE'S # SUBS IN IND	-0.109 ^b (0.045)	-0.102 ^b (0.046)	-0.090 ^b (0.045)	-0.091 ^b (0.045)
SUB, MNE DIFFRNT IND	0.025 (0.040)	-0.003 (0.054)	-0.058 (0.049)	-0.038 (0.047)
FAMILIARITY WITH HOST	-0.331 ^c (0.041)	-0.330 ^c (0.041)	-0.331 ^c (0.041)	-0.322 ^c (0.041)
INDUSTRIAL GNP OF HOST	0.150 ^c (0.041)	0.150 ^c (0.041)	0.151 ^c (0.040)	0.146 ^c (0.040)
RESTRICTIVE HOST GOV	0.180 ^c (0.031)	0.179 ^c (0.031)	0.177 ^c (0.031)	0.176 ^c (0.031)
> 10% SALES INTRASYSTEM	-0.070 ^b (0.035)	-0.070 ^b (0.035)	-0.063 ^b (0.035)	-0.073 ^b (0.035)
RESOURCE-BASED SUB IND	0.136 ^c (0.033)	0.135 ^c (0.033)	0.134 ^c (0.032)	0.158 ^c (0.031)
R&D/REV SUB IND	-0.037 (0.039)	-0.039 (0.039)	-0.173 ^c (0.064)	-
MARKETING/REV SUB IND	-0.196 ^c (0.043)	-0.232 ^c (0.065)	-0.198 ^c (0.043)	-0.193 ^c (0.046)
MKTNG × DIFFIND	-	0.057 (0.075)	-	-
R&D × DIFFIND	-	-	0.200 ^c (0.071)	-
PRODUCT PATENT SUB IND	-	-	-	-0.125 ^a (0.083)
PROCESS PATENT SUB IND	-	-	-	0.066 (0.080)
PRODUCT PAT × DIFFIND	-	-	-	0.168 ^b (0.087)
PROCESS PAT × DIFFIND	-	-	-	-0.008 (0.088)
R^2	0.122	0.122	0.127	0.127

^aStatistically significant at 0.10 level (one-tailed).

^bStatistically significant at 0.05 level (one-tailed).

^cStatistically significant at 0.005 level (one-tailed).

6.2.2. Control variable

As noted above, estimating the effects of the independent variables on MNEs' ownership preferences required controlling for the effect of host-government policies. Because governments in a number of countries in the sample encouraged joint ventures but did not have an iron-clad policy against 100% foreign ownership, the choices that MNEs made there still reflected their preferences, albeit with an additional effect due to government

policies (section 2). The following variable was thus included in the analysis to control for the effect of government policy:

RESTRICTIVE HOST GOVT Dummy variable equal to 1 if the subsidiary was in one of the following host countries, which in 1975 had policies restricting foreign ownership or encouraging joint ventures: France, Australia, Brazil, Venezuela, Philippines, Colombia, New Zealand, Iran, South Korea, Peru, Malaysia, Nigeria, Indonesia and Ecuador. From U.S. Department of Commerce (1981). (mean = 0.33; sd = 0.47).

The results show that restrictive host-government policies strongly encouraged joint ventures (table 2, column 2.1), but this effect was not greater than those of other factors discussed below. With all else equal, the odds that a subsidiary in a restrictive was a joint venture was more than double the odds in a nonrestrictive country.¹¹ Further analysis of the effects of host-government ownership restrictions is in Gomes-Casseres (1988b).

6.3. *Effects of industry and geographic experience*

The model presented above predicts that the relative experience of MNEs and local firms influences the potential benefits from cooperation between them (section 3). The attractiveness of joint ventures can thus be expected to increase as an MNE's experience in the subsidiary's industry or host country decreases. Similarly, as economic development raises the experience and sophistication of local firms, they are likely to have more to contribute to the MNE's subsidiaries, increasing the attractiveness of joint ventures. A number of tests discussed in this section supported these hypotheses.

Two variables were used to measure the extent of the *MNE's industry experience*:

MNE'S # SUBS IN IND Number of foreign manufacturing subsidiaries that the parent MNE had in 1975 in the

¹¹This and the other multiplicative effects on the odds of joint venture that are noted in the text cannot be calculated directly from the results presented in the tables. They were derived by using the coefficients of the logit analyses in a simulation to predict the probability of joint venture at given levels of the independent variables. When calculating the effect of any one variable, the averages for the other variables were plugged into two simulation runs, each with a different value for the variable of interest.

same 3-digit SIC industry as the subsidiary's principal product. From Harvard MNE database. (mean = 15; sd = 13).

SUB, MNE DIFFRNT IND Dummy variable equal to 1 if the principal 3-digit SIC product of the subsidiary was different from that of the parent MNE in 1975. From Harvard MNE database. (mean = 0.59; sd = 0.49).

The first variable measured the extent of the MNE's previous experience in the subsidiary's industry. As predicted, it had a strong negative effect on the probability of joint venture (table 2, column 2.1). For example, if an MNE had 30 foreign investments in the same industry as the subsidiary, the odds of a joint venture were about 40% lower than if it had only one such investment. This implies that MNEs with a large worldwide network of subsidiaries in similar industries will prefer whole ownership over joint ventures. These MNEs may also be able to exploit global economies of scale better than their competitors with smaller worldwide networks. As discussed below, such global strategies also discouraged joint ventures.¹²

The second variable measured whether or not the subsidiary was in the MNE's main line of business. The assumption in using this as a proxy for experience is that the parent firm has relatively more experience in its main business than in peripheral businesses. By itself, this variable had no effect on the probability of joint venture (table 2, column 2.1), contradicting Stopford and Wells's (1972) results. Nevertheless, there were strong interaction effects between this and other variables, as discussed below.

The *geographic experience of the MNEs* was also measured by their previous investment activity:

FAMILIARITY WITH HOST Index (from 0 to 16) of how 'familiar' foreign host countries were to U.S. MNEs, based on how often these MNEs entered one country before another during 1900-1976. From Davidson (1980). (mean = 9.1; sd = 5.9).

The model predicts that the benefits of a joint venture were lower when an MNE entered a familiar country, such as Canada (index = 16), that when it

¹²For a discussion of how the opportunity to exploit global scale economies varied over time and influenced the evolution of U.S. MNEs' ownership strategies, see Gomes-Casseres (1988a).

entered a less familiar one, such as Argentina (index = 8). Consistent with this prediction, this variable had a strong negative effect on the probability of joint venture (table 2, column 2.1). For example, the odds of a joint venture in Argentina were two-and-a-half times those of a joint venture in Canada. Because the analysis included a separate variable measuring the size of the host country's industrial sector (see below), the effect of the familiarity variable was not confounded by differences in the host countries' levels of development. The effect of familiarity with the host country was larger than of any other factor examined here, suggesting that one of the primary reasons for joint ventures was to provide MNEs with access to information about the local environment.

Aside from the experience of the MNE, that of local firms could also influence the attractiveness of joint ventures (section 3). Unfortunately, no data were available to measure directly the industry or country experience of these firms. Instead, the overall level of industrial activity in the host country was used as a proxy for the *experience of local firms*:

INDUSTRIAL GNP OF HOST Size of host country's industrial sector in 1976, in millions of U.S. dollars. From World Bank (1978). (mean = 66,380; sd = 68,200).

The assumption here is that as the size of a country's industrial sector grows, local firms acquire commercial experience that may be valuable to an MNE.¹³ As a result, the benefits of joint ventures should increase with the size of the host country's industrial sector. This variable indeed had a strong positive effect on the probability of joint venture (table 2, column 2.1). Holding all else constant (including country familiarity), the odds of a joint venture were 50% higher in a country with a \$120 billion industrial sector (e.g., the U.K.) than in one with a \$30 billion sector (e.g., Australia). The effect of this variable was about as large as that of the host government's ownership policy discussed above.

6.4. *Effects of access to markets and inputs*

Another firm capability that could affect the costs and benefits of joint ventures was privileged access to resources or markets (section 3). For example, MNEs were likely to be attracted to joint ventures with local firms

¹³This is admittedly a rough proxy for the experience of local firms. But it tends to agree with other indicators, such as the number of world-scale competitors from each country. For example, India, with a large industrial sector but low per capita income had more firms in the international *Fortune 500* (5) than Austria, with a smaller industrial sector but higher per capita income (2).

that were vertically integrated with producers of raw materials. But vertical integration between one partner and the joint venture could also increase the costs of cooperation by heightening management conflicts over transfer prices (section 5). This was especially likely when the vertical integration caused the requirements of global profit maximization by the MNE to diverge from those of local profit maximization by the partner. Tests with two variables supported these conjectures.

The extent of vertical integration between the MNE and the subsidiary was measured by the importance to the subsidiary of sales to the MNE's system:

>10% SALES INTRASYSTEM Dummy variable equal to 1 if more than 10% of the subsidiary's sales in 1975 were to other members of the parent MNE's system. From Harvard MNE database. (mean = 0.19; sd = 0.39).

When intrasystem sales were high, the potential for conflicts of interest between a local partner and the MNE can be expected to be greater than when such sales were small. As expected, high intrasystem sales discouraged joint ventures (table 2, column 2.1). The odds of a joint venture were about one-third lower for a subsidiary that sold more than 10% of its output to the MNE system than for one that sold less.

The extent of vertical integration between the local partner and the subsidiary could not be measured directly. Instead, a proxy was used to indicate if the subsidiary was in an industry where local backward integration was likely to be important:

RESOURCE-BASED SUB IND Dummy variable equal to 1 if the subsidiary's main product was in one of the following 2-digit SIC groups, which can be considered 'resource-based' industries: food and beverages (SIC 20), tobacco (SIC 21), textile mills (SIC 22), wood except furniture (SIC 24), pulp and paper (SIC 26), petroleum (SIC 29), rubber (SIC 30), and primary metals (SIC 33). Subsidiary's product from Harvard MNE database. (mean = 0.25; sd = 0.44).

The use of this proxy assumes that local firms are more likely than MNEs

to have privileged access to a domestic supply of agricultural or mineral resources and that the domestic market for these resources is not competitive. As a result, MNEs should be more likely to form joint ventures in these industries than in others. This variable indeed had a strong positive effect on the probability of joint venture (table 2, column 2.1). Subsidiaries in resource-based industries were about twice as likely to be joint ventures as those in other industries. The effect of this variable was about as large as those of the other two factors described above that encouraged joint ventures – local experience and government policy.

There is an alternative explanation for this effect. The industries classified as resource-based also represent those activities that countries engage in first as they begin industrialization. These industries are also least likely to depend on sophisticated R&D and marketing capabilities. (The resource variable was negatively correlated with the R&D- and marketing-intensity variables introduced below.) The relative experience of local firms thus would be greater in such basic industries than in more advanced sectors. This relative experience argument might also explain the higher incidence of joint ventures in resource-based sectors; it too is consistent with the arguments presented above (section 3).

6.5. Transfers of marketing and technological skills

The model developed above identified two other types of firm capabilities that may be important in determining ownership choices, i.e., marketing and technological skills (section 3). Both types of skills are likely to encounter high transaction costs when transferred contractually. As a result, MNEs can be expected to choose wholly owned structures when transferring their own marketing and technological capabilities to new subsidiaries, but to prefer joint ventures when they need to acquire such capabilities from local firms (section 4).

These hypotheses imply interaction effects between the measures of MNE capabilities and the nature of the business. In other words, one would expect wholly owned structures when the MNE was highly experienced in a marketing- or R&D-intensive industry, and joint ventures when it was not. The results of tests with the R&D variables supported these theoretical predictions strongly, but those with the marketing variables were less clear-cut. Four variables were used in these tests:

MARKETING/REV SUB IND	Average share that total marketing expenses represented in revenues of PIMS SBUs in the subsidiary's principal 4-digit SIC industry. From PIMS database. (mean = 0.12; sd = 0.10).
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R&D/REV SUB IND	Average share that R&D expenses represented in revenues of PIMS SBUs in the subsidiary's principal 4-digit SIC industry. From PIMS database, (mean = 0.026; sd = 0.023).
MKTNG × DIFFIND	Product of MARKETING/REV SUB IND and SUB, MNE DIFFRNT IND variables. (Each is defined above.)
R&D × DIFFIND	Product of R&D/REV SUB IND and SUB, MNE DIFFRNT IND variables. (Each is defined above.)

6.5.1. *Marketing intensity*

Subsidiaries in marketing-intensive industries were less likely to be joint ventures than others (table 2, column 2.1); this was a strong effect, comparable in size to the (opposite) effect of host government ownership restrictions. But there was no statistically significant interaction between marketing intensity and the measure of relative firm experience (table 2, column 2.2). Even when MNEs invested outside their main line of business, therefore, marketing intensity encouraged whole ownership.

There may be two explanations for this last result. One is that marketing skills may be transferable across industries, so that an MNE can apply its core capabilities outside its main businesses too. Alternatively, the marketing capabilities of U.S. firms may have been so highly developed, perhaps due to the nature of the U.S. market [Horst (1974)], that they exceeded those of local firms even in areas that were somewhat new to the MNE. As a result of either of these conditions, a U.S. MNE investing outside of its main business would not need to acquire capabilities from locals, reducing the benefits of a joint venture.

The negative effect of marketing intensity on the probability of joint venture under such conditions is fully consistent with the arguments developed above. Not only is there little benefit to a joint venture when the MNE's marketing capabilities exceed those of the local firm, but there may be severe costs to shared management. Because the MNE often has to guard its global reputation, disagreements can arise with local partners that have lower quality standards (section 5.1). Also, marketing efforts that depend on sales forces may be particularly difficult to monitor and implement contractually, leading to potentially high shirking costs in joint ventures (section 5.2). There exists some evidence to suggest that the impact of marketing skills on ownership choices was particularly strong in sales force-intensive industries [Gomes-Casseres (1985)].

Table 3
Probability of joint venture according to relative firm experience and R&D intensity.*

Relative experience of MNE	R&D intensity		
	Low	High	
	Proxy: Share of R&D expense in revenue in the subsidiary's industry		
	0.5%	10%	
high	Yes	0.23	0.06
low	No	0.20	0.25

*The table shows the probabilities of a joint venture, compared to the alternative of a wholly owned MNE subsidiary. It is based on the results of the logit analysis shown in table 2, column 2.3.

These arguments do not exclude the possibility that some MNEs formed JVs as a means of acquiring market share from local firms. Some clinical evidence points to such motivations [Gomes-Casseres (1985)]. This rationale for joint ventures may apply even in industries with relatively low marketing expenditures. What is likely to be more important here is the dynamism of the local market. To the extent that tastes are set and growth is slow, joint ventures with existing firms may be a better way to acquire market share than wholly owned greenfield operations. The higher incidence of joint ventures in large, industrialized markets discussed above is consistent with this argument (section 6.3).

6.5.2. Research intensity

The effect of R&D intensity was fully consistent with the model developed above. By itself, the R&D variable seemed to have no effect on the probability of joint venture (table 2, column 2.1), contradicting the long-standing findings of Stopford and Wells (1972). This result stemmed from the opposite effects of R&D intensity in two situations, as shown by the results of the analysis including the interaction term defined above (table 2, column 2.3). When the subsidiary was outside the MNE's core business, R&D intensity encouraged joint ventures. But, when it was inside that business, R&D intensity discouraged joint ventures. This pattern is clearly evident in the example in table 3.

The finding that R&D intensity encourages joint ventures when the MNE invests outside its main line of business (table 3) is consistent with studies arguing that domestic joint ventures are most common in R&D-intensive

industries [Ferguson (1981); Friedman, Berg and Duncan (1979)]. These studies found that joint ventures can be an alternative to internal R&D, as they enable the firm to acquire technological skills developed by others. Since transaction costs tend to be particularly high in skill transfers in R&D-intensive industries [Buckley and Casson (1976; Ferguson (1981); Teece (1981, 1986a)], ownership channels will be used in such situations, leading to joint ventures.

But when it is the MNE itself, rather than a local firm, that transfers technological capabilities to the subsidiary, then there are fewer benefits from a joint venture and greater costs. The same arguments that lead to high transaction costs for contractual transfers of technological capability then imply that management agreements between joint venture partners will be costly (section 5.2). In addition, the likelihood of shirking by the MNE increases when joint ownership creates the possibility that the local partner will leak technological secrets (section 5.1). As a result, R&D intensity strongly discouraged joint ventures in subsidiaries inside the MNE's line of business (table 3).

An alternative explanation for this pattern of results is that the R&D activities of MNEs may sometimes yield innovations that lie outside the firm's main line of business. To exploit these innovations, the MNE may need the contributions of local firms simply because it is not experienced in these fields.¹⁴

6.5.3. *Product and process technologies*

Additional tests showed that the role of technological capabilities in ownership choices varied according to whether product or process technologies were critical to the subsidiary's business. These tests provide additional evidence on the impacts of transaction and organizational costs on MNE ownership preferences. Four new independent variables were used in these tests:

PRODUCT PATENT SUB IND	Share of PIMS SBUs in the subsidiary's principal 4-digit SIC industry that benefited to a significant degree from patents, trade secrets, or other proprietary methods pertaining to its <i>products</i> . From PIMS database. (mean = 0.21; sd = 0.24).
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¹⁴I am indebted to Richard Caves for emphasizing this alternative explanation. Stopford and Wells (1972) hypothesized that in such situations the MNE might seek marketing skills from local firms. But, separate tests not shown here suggest that there was no interaction between marketing intensity, R&D intensity, and the line-of-business variable, as would be expected from this hypothesis [Gomes-Casseres (1985, pp. 190-193)].

PROCESS PATENT SUB IND	Share of PIMS SBUs in the subsidiary's principal 4-digit SIC industry that benefited to a significant degree from patents, trade secrets, or other proprietary methods pertaining to its <i>processes</i> . From PIMS database. (mean = 0.18; sd = 0.24).
PRODUCT PAT × DIFFIND	Product of PRODUCT PATENT SUB IND and SUB, MNE DIFFRNT IND variables. (Each is defined above.)
PROCESS PAT × DIFFIND	Product of PROCESS PATENT SUB IND and SUB, MNE DIFFRNT IND variables. (Each is defined above.)

There is little in the existing literature on international business to suggest what effects these variables should have on ownership strategies. But a few studies hypothesized that costs of contractual transfers may be lower for process than for product technologies [Mansfield, Romeo and Wagner (1979); Caves (1971); Brada (1981)]. There may be several reasons why this is so.

One of the purposes of R&D is to create differentiated products that yield monopolistic profits [Comanor (1967)]. Proprietary products are more often associated with such product differentiation than proprietary processes. The latter tend to be more important for mature products [Hayes and Wheelwright (1984)], where competition is driven by low-cost strategies. Product technologies may thus lead to monopolistic profits more often than process technologies. Therefore, firms with product advantages have more to lose from uncontrolled diffusion of their technologies than firms with process technologies. The costs of contractual transfers thus may be higher for product than for process technologies, and joint venture conflicts may be more common in the former.

Also, the costs and benefits of introducing a new product into a country may be more difficult to predict than those of a new process. In the former case, both final demand and manufacturing costs are uncertain. In the latter case, the costs of inputs and outputs are known, demand for the product is known, and manufacturing costs can usually be estimated. Since uncertainties about the value of a technology increase transaction costs [Teece (1981)], the costs of contractual transfers will be higher for product than for process technologies.

Table 4
Probability of joint venture according to relative firm experience and importance of proprietary technologies.^a

Importance of proprietary technologies in subsidiary's business			Relative experience of MNE	
			high	low
			Proxy: Is the subsidiary in the same industry as the MNE?	
			Yes	No
low	Proxy: Share of PIMS SBUs in which product secrets were important	5%	0.21	0.19
high		50%	0.14	0.23
low	Proxy: Share of PIMS SBUs in which process secrets were important	5%	0.17	0.20
high		50%	0.21	0.23

^aThe table shows the probabilities of a joint venture, compared to the alternative of a wholly owned MNE subsidiary. It is based on the results of the logit analysis shown in table 2, column 2.4.

These arguments predict that patterns similar to those observed above for R&D-intensive industries are more likely to exist in industries where product technologies are important than in those where process advantages are critical. For the former industries one might thus expect a predominance of wholly owned subsidiaries when the MNE does not need the capabilities of the local firm, and a predominance of joint ventures when it does need them. Because of the generally lower transaction costs for process technologies, this pattern need not arise in the latter industries.

The results of statistical tests confirmed these predictions. The effect of the interaction term for product technologies was positive, while the effect of the interaction term for process technologies was not statistically significant (table 2, column 2.4). Table 4 provides an example of these interaction effects.

In industries relying on product technologies, MNE experience discouraged joint ventures and local firm experience encouraged them (table 4, top part). In industries relying on process technologies, the effect of relative firm experience was negligible (table 4, bottom part). Although the MNEs and local firms may well have been combining capabilities in these industries, they did not need to use ownership channels, as transaction costs were low.

7. Conclusion

Theoretical argument and empirical evidence thus suggest that the ownership preferences of MNEs are driven by a combination of three sets of factors. The first is the relative capabilities of the MNEs and host country firms. Differences between these capabilities affect the potential benefits of cooperation between them. The second set of factors is the transaction cost of transferring each partner's capability to a cooperative venture. When the costs of using contractual channels are high for both partners' contributions, ownership channels are preferred, suggesting the need for a joint venture. The third set of factors cuts into the benefits flowing from the first two. It involves special costs of joint ventures stemming from shirking by partners and increased management costs due to conflicts of interest between the partners.

Transaction cost arguments are thus useful for understanding the organization of foreign subsidiaries, in addition to explaining the rationale for foreign direct investment. This suggests that the approach may be valuable as a general framework for understanding international business decisions. It is likely that more detailed predictions will become possible in the future, concerning, for example, management systems of foreign subsidiaries and their relations with MNE headquarters.

At the same time, however, transaction cost arguments are clearly not sufficient on their own to explain MNE behavior. Theories of foreign direct investment, for example, also involve arguments about when foreign production is more attractive than exports. In explaining ownership structures, I combined transaction cost theory with arguments about the strategic benefits of cooperation between firms. These underlying motivations determine the rationale for and the types of transactions between the firms; transaction costs then determine the most efficient organizational form for cooperation.

Finally, the analysis here should serve as a reminder of the importance of management costs inside organizations. The costs of managing a joint venture can be great, and may outweigh the benefits from using ownership channels for partners' contributions. These organizational costs are sensitive to a firm's ownership stake in a venture, as described in the principals-and-agents literature. Greater synthesis of ideas from this literature with the two types of arguments cited above is likely to pay off well in the study of the economics of the MNE.

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