

# Overseas Entry Decision and Ownership Strategy of Japanese Companies: Institution and Corporate Governance

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## Abstract

Using 20-year panel data, this paper tests Japanese companies' sequential decisions: (1) to invest abroad or not and (2) if so, what ownership strategy for that local company to be employed. In addition to transaction advantage emphasized by traditional studies on FDI, the focus is the role of corporate governance of the parent companies and institutional environment of the host countries. Through Heckman's two-step estimation, corporate governance is found to play an important role for entry decision but not for ownership strategy. Transaction cost approach has been well supported for entry decision. Most importantly, an institutional environment favorable to MNEs leads to higher level of ownership of local companies. Firm size plays a significant role for FDI decision as well as for ownership decision.

Key words: Sample selection bias; Entry decision; Ownership strategy; Corporate governance; Institution

JEL Classification: F2; O53; C3

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# 1 Introduction

Two main questions on the geographical analysis of foreign direct investment (FDI) are why a firm decides to be multinational and why differing degrees of ownership are utilized by multinational enterprises (MNEs). Several hypotheses have been suggested to address the former question. The most popular approach is the transaction cost theory (Coase, 1937), indicated as “transaction advantage” throughout the paper, which investigates the determinants of FDI and discusses the nature of the firm (Dunning, 1981; Markusen, 1995). It argues that because of high transaction costs associated with the difficulties in selling intangible assets, firms can only gain a return on these assets by producing the goods themselves. In fact, this view has been central to much recent analyses of MNE’s role in the economy (Helpman, 1984; Helpman and Krugman, 1985; Ethier, 1986; Barrel and Pain, 1999).

Once a firm has decided to enter a foreign market, it must make an ownership decision on which ownership to use for that market, where ownership is defined as percent equity holding taken when a foreign investment is made. Most early studies on ownership strategies concentrate on transaction cost explanations such as Buckley and Casson (1976) and Hennart (1982). Driven by transaction-related motives, a direct investment in a foreign market means transferring of firm-specific advantages to that market (Hymer, 1976). Hence, higher ownership levels are interpreted as a response to the need to protect firm-specific knowledge from unwanted dissemination (Grossman and Hart, 1986). This argument is legally supported by various researchers in their empirical examination of ownership strategies (e.g., Anderson and Gatignon, 1986; Gatignon and Anderson, 1988; Gomes-Cassers, 1989; Erramilli and Rao, 1993; Padmanabhan and Cho, 1996).

Since the need to safeguard assets transferred to the foreign investment has been recognized as an important determinant of ownership levels, recent works have begun extending the transaction cost approach by including institutional variables of host country. Institutional variables include a broad array of host country characteristics such as political and legal rules and social norms for business transactions which enhance our understanding of ownership strategies (North, 1990). Aspects of the institutional environment can have direct and indirect effects on a foreign firm’s ownership strategy (Kogut and Singh,

1988). Several empirical studies (e.g., Beamish and Banks, 1987; Gomes-Casseres, 1989, 1990; Hennart, 1991; Hennart and Larimo, 1998; Delios and Beamish, 1999; Brouthers and Brouthers, 2000; Makino and Neupert, 2000) explored the influence of local environment on ownership strategies and found that foreign ownership level declined with the increased need to source locally based host country assets.

The sharp increase of Japanese FDI over the last decade has provoked a substantial amount of research into the determinants of Japanese FDI. There is now an extensive body of literature suggesting that Japanese investment in industrial countries are explained by similar factors, mainly firm-specific advantages such as R&D and advertising intensities (Kimura, 1989; Kogut and Chang, 1991; Drake and Caves, 1992; Hennart and Park, 1994; Belderbos and Sleuwaegen, 1996; Pugel, Kragas, and Kimura, 1996). However, a recent study on ownership strategy of Japanese MNEs by Delios and Beamish (1999) finds that when firm-level asset specificity was examined jointly with institutional variables, the observed patterns in ownership levels in the subsidiaries of the nine East and South-East Asian countries were not consistent with the predictions of transaction cost theory.

Using 20 year panel data of Japanese companies, this paper contributes to the literature through the following three ways. First, the traditional approach discussed above considers separately entry decision and ownership strategy so that domestic companies which do not join the investment abroad are ignored. Thus using Heckman's (1979) two-step estimation procedure, this paper simultaneously considers these two decisions and empirically investigates the relative importance of the main approaches discussed above.

Second, this paper contributes to the growing debate surrounding transaction cost theory (Ghoshal and Moran, 1996; Madhok, 1997) by testing the predictions of this theory in a model with improved measures of transaction advantage and against competing explanations regarding the importance of nontransactional factors such as corporate governance of parent companies and institutional characteristics of host country that are less considered in previous empirical studies. In estimation analysis, corporate governance is defined as ownership structure by foreign investors, financial institutions and individual investors. As Moschandreas (1994) indicated, the ownership structure of Japanese firms is characterized by a relatively large equity share owned by banks and other financial institutions.

Third, it provides empirical estimation advantage by using firm-level data. Compared to the studies referred above, this paper is expected to increase the robustness of estimation results by extending the number of host countries, sample firms and sample periods.

Through Heckman two-step estimation, corporate governance is found to play an important role only for entry decision but not for ownership strategy. R&D which reflects transaction advantage plays a significant role for entry decision but not for ownership strategy while advertising intensity is shown to be significant for entry decision as well as for ownership strategy. Another variable of transaction advantage, real GDP per capita of host country, shows inverse relation with ownership level. The estimation results are in contrast with the findings by Delios and Beamish (1999) for Japanese MNEs in East Asian countries.

Most importantly, the institutional environment plays a significant and robust role in ownership strategies, suggesting that an environment favorable to MNEs leads to higher level of ownership of local companies. And age is shown to be significant for entry decision supporting an ecological perspective. Finally, Keiretsu is not shown to be significant for entry decision as well as ownership strategy.

The paper is organized as follows. Section 2 discusses the model structure and Section 3 describes data and determinants of entry decision and ownership strategy. After the estimation results are discussed, Section 5 concludes.

## **2 Model Specification**

### **2.1 Model Structure and Ownership Strategy**

The model structure on the joint decision of entry decision and ownership strategy is simplified in Figure 1. In stage 1, all companies in Japan are supposed to decide whether they will invest abroad or not. This entry decision is mainly determined by transaction advantage as well as the other characteristics of the parent companies such as corporate governance and age. Thus unlike in previous studies, companies that are not investing abroad are also considered in the estimation process.

In stage 2, companies that have decided to invest abroad choose the share of ownership of local companies in host countries. Their decision is assumed to be determined by their

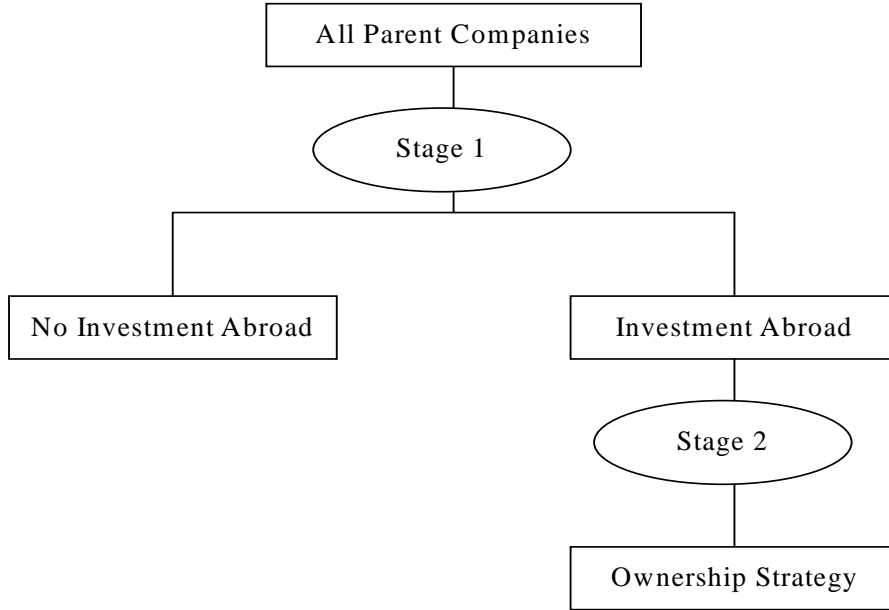


Figure 1: Model Structure

transaction advantage over local competitors, their own corporate governance as well as their preference for an investment environment, i.e., institutional environment.

Since entry decision in stage 1 has been developed well in the studies referred above, ownership strategy in stage 2 is discussed in detail. In the beginning, corporate governance is assumed to be constant to focus on the joint effect of transaction advantage and institutional environment.

Let us assume a simple nonlinear combination of institutional environment and transaction advantage. Then ownership level,  $0 \leq Own_{ijt} \leq 1$ , of firm  $i$  in country  $j$  at time  $t$  is determined by:

$$Own_{ijt} = \Theta_{jt} G_{ijt}^{\eta} \quad (1)$$

where  $\Theta_{jt}$  is the institutional environment of host country  $j$  at time  $t$  and  $G_{ijt}$  is defined as transaction advantage between parent company  $i$  and company  $j$  in host country at time

$t$ .<sup>1</sup> Here  $\eta > 0$  implies a nonlinear and positive relation between transaction advantages and ownership levels. Figure 2 (with  $\eta = 1$ ) shows how institutional environment and transaction advantage play roles in ownership strategy and provides the following implications.

**Remark 1 (Institutional Environment)** *Suppose that parent company  $i$  decides to invest to two countries 1 and 2, and assume that two host countries have the same transaction advantage,  $G_0$ , but different levels of institutional environment,  $\Theta_1 > \Theta_2$ . Then we can easily show that parent company  $i$  will prefer higher ownership for country 1 under the same transaction advantage,  $own_{i1} > own_{i2}$ .*

**Remark 2 (Transaction Advantage)** *Suppose that two host countries, 1 and 2, have the same institutional environment,  $\Theta_1 = \Theta_2$ . The ownership levels chosen by parent company  $i$  will be ranked solely by transaction advantage, supporting transaction cost hypothesis.*

**Remark 3 (Transaction Advantage and Institution)** *Assume that transaction advantage with country 1 is lower than that with country 2, i.e.,  $G_{i1} < G_{i2A}$  or  $G_{i1} < G_{i2B}$ . Since institutional environment of country 1 is better than that of country 2,  $\Theta_1 > \Theta_2$ , ownership will be  $Own_{i2A}$  or  $Own_{i2B}$ , depending on transaction advantage.*

## 2.2 Empirical Specification

The determinants of entry decision and ownership strategy can be effectively examined by jointly investigating the factors discussed above such as transaction advantage, institution, and corporate governance.

First, in order to identify the determinants of FDI decision, the following stochastic model of the latent variable is used.

$$FDI_{it} = \alpha X_{it} + u_{it}, \quad (2)$$

where  $FDI_{it}$  is a latent variable of FDI of firm  $i$  at time  $t$  which is observed only when positive. The matrix,  $X$ , includes various firm characteristics. The last term,  $u$ , represents the well-behaved stochastic error term. Notice that  $FDI_{it}$  is independent of host country

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<sup>1</sup>For a brevity, the same symbol,  $j$ , is used for the host country and company.

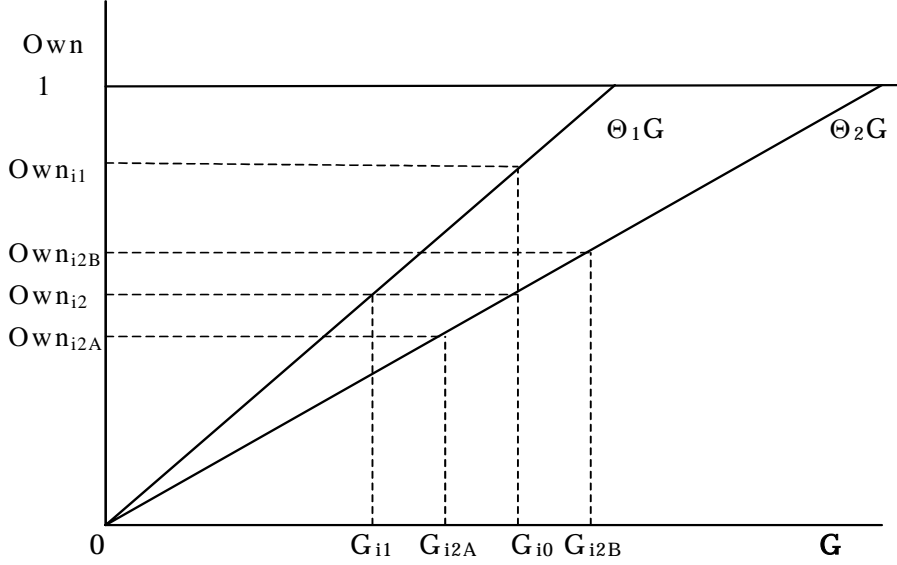


Figure 2: Transaction Advantage and Institutional Environment

$j$ . Thus equation (2) assumes that the entry decision by individual firm is conducted by its own characteristics because all firms face identical institutional environment in the world.

Then the entry decision function is defined by the following binary response model assuming probit structure:

$$d\_FDI_{it} = 1[\alpha X_{it} + u_{it} > 0], \quad (3)$$

where  $1[\ ]$  is an indicator function.

From equation (3),  $P[d\_FDI_{it}|X_{it}] = \Phi(\alpha X_{it})$  where  $\Phi(\ )$  is the standard cumulative normal density.

Next, a firm's strategic decision on which ownership to use in accordance to its entry to a foreign market is estimated by using the following:

$$Own_{ijt} = \beta_0 G_{ijt} + \beta_1 X_{it} + \beta_2 Y_{jt} + \varepsilon_{ijt} \text{ if } d\_FDI_{it} = 1, \quad (4)$$

where  $Own_{ijt}$  is the ownership share of firm  $i$  to a subsidiary in country  $j$  at time  $t$ .  $X_{it}$  is the same as in equation (2) and  $Y_{jt}$  is included as another set of independent variables

in order to consider the effects of host country characteristics which are independent of the parent company. Note that all MNEs investing to the same host countries face identical host country characteristics.  $\varepsilon_{ij}$  is a well-behaved stochastic error term.<sup>2</sup>

Least squares regression using the observed data produces inconsistent estimates of parameters ( $\beta_0, \beta_1, \beta_2$ ) (Heckman, 1979). In order to get consistent estimation of the parameters, we follow Heckman's two-step estimation which considers the presence of selection bias as an omitted variable problem in the selected sample. The equation to examine is the one for ownership, conditioned on the event of a FDI decision of equation (2). Following equations (3) and (4),

$$d\_FDI_{it} = 1[\alpha X_{it} + u_{it} > 0], \quad (5)$$

$$Own_{ijt} = \alpha G_{ijt} + \beta_1 X_{it} + \beta_2 Y_{jt} + \varepsilon_{ijt} \text{ if } d\_FDI_{it} = 1, \quad (6)$$

where a)  $u_i$  and  $\varepsilon_{ij}$  are independent of explanatory variables with zero mean, b)  $u_i \sim N(0, 1)$ , and c)  $E[\varepsilon_{ij}|u_i] = \rho u_i$ .<sup>3</sup>

### 3 Data and Descriptive Statistics

#### 3.1 Data

The sample of Japanese foreign subsidiaries is drawn from the 2001 *Kaigai Shinshutsu Kigyō* (Overseas Japanese Companies Data). Toyo Keizai compiles this data as a part of an annual survey of the overseas operations of major listed and non-listed Japanese companies. The survey data are supplemented by referring to annual reports, newspaper accounts and other media. Our initial sample totaled 13,779 subsidiaries.<sup>4</sup> Because parent company data

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<sup>2</sup>Since  $Own_{ijt}$  is defined only between 0 and 1, equation (4) can be estimated by a Tobit model. Since the estimation results are compared with those of a sample selection model by Heckman, the paper uses a linear regression to ignore a common bias of the estimated coefficients from both estimation techniques. Then we can isolate the effect of the sample selection bias by ignoring bias by a linear regression.

<sup>3</sup>The assumption  $E[\varepsilon_{ij}|u_i] = \rho u_i$  requires linearity in the population regression of  $\varepsilon_{ij}$  on  $u_i$ . It always holds if  $(\varepsilon_{ij}, u_i)$  is bivariate normal but holds under weaker assumptions. In particular, we do not need to assume that  $\varepsilon_{ij}$  itself is normally distributed (Wooldridge, 2002, p.562).

<sup>4</sup>The 4,441 subsidiaries which belong to the same parent companies are excluded.



Table 1: Ownership Strategy by Years and Industries (Full Sample)

	Manufacturing	Non-manufacturing	Total
	Average Ownership		
1980-1984	62.3(536)	70.7(653)	66.9(1,189)
1985-1989	62.6(1,364)	71.5(1,854)	67.8(3,218)
1990-1994	62.2(1,635)	65.4(1,635)	64.1(4,113)
1995-1999	60.8(2,227)	66.4(3,032)	64.0(5,259)
Total	61.8(5,762)	67.6(8,017)	65.2(13,779)

Note: The numbers of foreign affiliates are in parentheses.

were required for our analysis, we matched the identical parent company for each subsidiary to the companies obtained from the Nikkei Economic Electronic Databank System (NEEDS) collected by *Nikkei Zaimu* of *Nihon Keizai Shinbun* (2002). The establishment year data are sourced from the Japan Company Handbook, documented annually by Toyo Keizai. GDP per capita is from World Development Indicators (2002).

### 3.2 Trends of Ownership Strategy

Table 1 shows the average ownership across years and industries. Over 1980-1999, the average ownership of Japanese companies in 13,779 foreign affiliates was 65.2 percent. By industry, non-manufacturing industries held relatively higher ownership (67.6 percent) relative to that of manufacturing sector (61.8 percent). There is no significant change in this trend over years except a slight drop in the non-manufacturing sector.

### 3.3 Determinants of Entry Decision and Ownership Strategy

The main determinants for entry decision and ownership strategy are classified into three groups. The first one is corporate governance which is reflected by the ownership structure of parent companies. It is assumed that corporate governance plays a significant role in deciding entry decision and ownership strategy. The second one is transaction advantage between the parent and host companies. The third group is the institutional environment of host countries which affects ownership strategy but not entry decision.

### 3.3.1 Corporate Governance

Corporate governance is defined by the ownership structure of parent company. Ownership by shareholders is the right to possess something and to decide what is to be done with it. A shareholder who owns a majority of a company's voting shares has a controlling interest. His/her vote decides who, apart from himself/herself or his/her representative, is appointed to the board of directors and so determines the policy of the business. This applies also when a few shareholders together own the majority. What remains in question then is how different ownership structures held by different economic agents affect FDI decision and ownership strategies.

Table 2 shows the recent trends of the ownership structures of manufacturing (Manu) and non-manufacturing (Non) industries since 1973, the first year of the availability of foreign ownership variable. The data includes six economic agents as shareholders: government/public institutions, financial institutions, security companies, foreigners, other corporations and individual investors. This paper categorizes them into five: government, foreigners, individuals, financial institutions (financial institutions and security companies) and other corporations.

The ownership structure of each category has shown different trends over the period. It is shown that the government ownership, although with many missing data, was higher in non-manufacturing sectors but the gap with other categories has narrowed since 1990s. Strikingly, foreign ownership has fluctuated since 1973 even though the absolute share is not high. For example, it has been stable until 1979 but has increased until 1985, decreased since then and increased again in 1989.<sup>5</sup> The ownership of financial institutions and other corporations tends to increase over time while that of individual investors indicates a decreasing trend between 1973 and 1991 and then stays stable until 1997. Since 1990, however, the gap among three agents, individuals, financial institutions and other corporations, becomes lower.

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<sup>5</sup>By sectors, as classified by Nikkei, the foreign ownership held by most of industries was less than 10 percent except for telecommunication (10.7 percent) in nonmanufacturing sector and pharmaceuticals (12.2 percent) and petroleum products (11.9 percent) in manufacturing sector. The data is available from the author on request.

Table 2: Recent Trends of Ownership Structure(percent)

	Government		Foreigner		Individual		Finance		Corporation	
	Manu	Non	Manu	Non	Manu	Non	Manu	Non	Manu	Non
1973	0.3	3.6	3.2	1.7	43.8	47.1	24.4	22.0	29.5	30.6
1975	0.2	2.0	2.7	1.2	43.0	46.3	24.4	22.0	30.9	31.1
1980	0.2	3.6	3.3	1.4	40.4	44.6	26.8	24.3	30.7	30.8
1985	0.2	3.1	5.8	3.6	34.4	40.2	28.5	24.6	31.3	32.4
1990	1.0	3.2	3.8	3.2	29.0	32.9	33.5	29.0	32.8	34.8
1995	0.2	0.6	5.5	4.9	30.0	33.0	32.2	28.1	31.4	33.8
1999	0.2	0.5	5.3	4.9	33.4	34.5	29.7	26.7	30.6	32.9
Total	0.2	1.6	4.5	3.7	34.9	37.7	29.3	26.2	31.3	32.9

Note: Manu and Non represent manufacturing and non-manufacturing industries, respectively.

### 3.3.2 Transaction Advantage

Many empirical literature discussed above defines transaction advantage as intangible assets held by the parent companies. However, as in Figure 1, this does not reflect real transaction advantage between the parent companies and the local companies since the level of transaction advantage of the local competitors varies across host countries and/or companies. Thus to reflect true transaction advantage of the parent companies, it is necessary to control for the level of transaction advantage of the local competitors. In this paper, the transaction advantage of the parent company is approximated by intangible assets held by them and that of the local competitors is by the real GDP per capita of host countries.

#### 1. Intangible assets

R&D intensity (knowledge) and advertising (goodwill) intensity are extensively used as representatives of intangible assets. Helpman (1984) predicts that firms with intangible assets would be more likely to invest abroad in order to minimize transaction costs and exploit their intangible assets overseas as well as at home.

As suggested by transaction cost theory, a greater degree of proprietary content in marketing and technological assets leads to higher ownership levels in the foreign operation because MNEs prefer internal channels over contracts when transferring technological capabilities. A firm with high R&D intensity may prefer to have complete control over its proprietary know-how in order to preserve and/or best exploit the know-how, given im-

perfections in the external markets for technology (e.g., Buckley and Casson, 1976; Caves, 1982). Thus, the higher the R&D intensity, the greater the possibility that the foreign affiliate will be fully-owned (Stopford and Wells, 1972; Davidson, 1982).

## 2. GDP per capita

When we consider ownership strategy across countries, the level of intangible assets held by the parent companies is not enough to calculate transaction advantage between the parent company and the local competitors of the host country. Therefore as an approximation of transaction advantage held by local competitors, per capita GDP is used. This variable can be interpreted as the level of labor productivity, representing the level of transaction advantage of the host countries.

### 3.3.3 Institutional Environment

In addition to transaction advantage variables, the institutional environment has been shown to affect the ownership strategies. As an institutional environment variable, Economic Freedom Indices, constructed by The Fraser Institute, are used. The summary index is based on 23 components designed to identify the consistency of institutional arrangements and policies with economic freedom in seven major areas and the data are released by 1 to 10 scale in every five years from 1970 to 1995 and every year afterward.<sup>6</sup> The core ingredients are personal choice, legal protection of property rights, freedom of exchange, reliance on markets, use of money, and market allocation of capital. Individuals have economic freedom when: (a) their property acquired without the use of force, fraud, or theft is protected from physical invasions by others and (b) they are not forced to use, exchange, or give their property to another as long as their actions do not violate the identical rights of others.<sup>7</sup>

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<sup>6</sup>The missing data of other years are generated by linearly interpolate method.

<sup>7</sup>Instead, it is likely that what matters most to MNEs is the extent to which future policies, e.g., taxation and regulation, can be forecast and how sensitive these policies are the changes in the current political environment. Recent works by Delios and Henisz (2000) and Henisz and Zelner (2001) begin to rectify these problems by employing a more objective measure of policy change and comparing its effectiveness in predicting market entry modes.

Table 3: Main Variables

Variable	Variable	Definition
Corporate governance	Foreign	ownership of foreign investors
	Individual	ownership of individual investors
	Finance	ownership of financial institutions
Transaction advantage	R&D	R&D expenditures/sales
	Advertising	advertising expenditures/sales
	GDP	real gdp per capita
Institutional environment	Institution	Economic freedom index
Other variables	Export	export/sales
	Firm size	sales
	Age	age of parent company
	Keiretsu	large bank-centered groups

### 3.3.4 Other Variables

In addition to the variables mentioned above, other control variables are considered. They are investing firm's size, age and membership to Keiretsu, and the ratio of export to GDP.

#### 1. The size of the parent company

Greater size allows companies to engage in more extensive international activities because it is reasoned that they are more likely to possess the necessary financial resources for foreign operations. The size of the parent company is measured by the number of total employees at the time (year) of foreign entry which is sourced from NEEDS (2002).

#### 2. Age

Setting up a first plant in a foreign country is a major strategic decision for most firms because it represents a departure from the organization's traditional practices and is surrounded by unusual uncertainty, thus requiring firms to search for information and legitimacy. Age is a potentially important variable affecting new market entry. Organizational ecologists have long argued that a firm's likelihood of engaging in strategic change depends on its age. The key concept in their reasoning is structural inertia. The older the firm, the less likely it is to engage in change or adaptation because the proliferation of rules, routines, and internal organizational arrangements over time reinforces the organization's adopted

course of action (Haveman, 1993; Ranger-Moore, 1997).

### 3. Exports

Conventional neoclassical models of the MNEs view exports and FDI as substitutes, particularly in the manufacturing sector. In addition, if FDI is directed to industries in which Japan has comparative advantages, then imports and FDI are likely to be positively related.<sup>8</sup> In particular, new products require specific skills and knowledge so that effective maintenance and support can be provided. The parent company may also find quality supervision more effective if it directly controls the network. Hence, whether exports and FDI are substitutes or complements needs to be resolved empirically. This variable is measured by the ratio of exports to sales.

### 4. Keiretsu

In addition to firm-specific assets, there are indications that there is a role to play for interfirm linkages within Japanese business group, Keiretsu. For instance, Hoshi, Kashyap, and Scharfstein (1992) found that firms that are members of one of the six bank-centered (horizontal) keiretsu are significantly less liquidity constrained in their investment decisions than non-member firms.<sup>9</sup> This could imply that membership of horizontal business groups also helps to facilitate financing of risky foreign ventures. This paper uses the six bank-centered keiretsu which are sourced from Kigyo Keiretsu Souran 1997 (Toyo Keizai).

The variables listed above and used in the estimation are summarized in Table 3 and the matrix of correlation coefficients of the variables is reported in the Appendix.

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<sup>8</sup>Graham and Krugmen (1993) argue that, for some industries, foreign investment is likely to be complementary with trade. Baldwin (1990) suggests that downstream services are typically associated with the level of export sales from the parent country to the host country. Some of these facilities can be set up by locals, although parent country involvement may be beneficial.

<sup>9</sup>In addition to Keiretsu, other variables used in the paper, firm size and ownership of financial institution, reflect the financial environment of parent companies for operations of foreign subsidiaries. For example, as the firm size or share of financial institutions is larger, a firm has more incentives to invest abroad because it has more financial resources.

Table 4: Baseline Model: Entry Decision and Ownership Strategy

	Decision		Ownership	
	(1)	(2)	(3)	(4)
Age	-0.233 (-3.45)**	-0.151 (-1.94)	0.119 (1.79)	0.151 (1.74)
Advertising	2.839 (2.48)**	2.984 (1.98)	-7.051 (-4.16)**	-7.935 (-4.11)**
Firm size	0.634 (39.78)**	0.610 (31.60)**	-0.116 (-9.00)**	-0.111 (-5.94)**
Keiretsu	0.055 (1.01)	0.061 (0.94)	-0.104 (-1.71)	-0.185 (-2.41)*
R&D		6.350 (4.78)**		-2.515 (-1.79)
Constant	-8.023 (-26.80)**	-8.040 (-22.56)**	4.877 (15.58)**	4.549 (11.03)**
year dummies	included	included	included	included
industry dummies	included	included	included	included
Observations	37,645	21,401	7,882	5,421
R-squared	0.42	0.36	0.05	0.06

Note: 1) Robust z statistics in parentheses.

2) \* significant at 5%; \*\* significant at 1%.

## 4 Estimation Results

This section tests the determinants of entry decision and ownership strategies by MNEs. First of all, the baseline model specification as a traditional approach is tested. Thus this model specification does not include the variables such as corporate governance and institutional environments. Next, after the determinants of two decisions are separately estimated by using probit and a linear regression estimation techniques, they are jointly estimated by a sample selection model by Heckman (1979).

### 4.1 Baseline Model Specification

This subsection tests the role of transaction advantage and other control variables which have been used in the traditional approach on the determinants of FDI and ownership strategy. Unlike the studies on FDI decision which use only companies which have invested abroad, we include all domestic and multinational companies. Table 4 reports the estimation

results for entry decision (Decision) by probit analysis and ownership strategy (Ownership) by a linear regression analysis, respectively.

As we expected, age is negatively related to entry decision so that the older the firm, the less likely it is to engage in change, i.e., investment abroad. But it is positively related to ownership level, showing that elder firms prefer higher ownership level. Thus the ecological view for FDI decision has been supported.

The results for the variables which reflect transaction advantage are interesting. Advertising and R&D intensity are positively related to FDI entry decision but negatively related to ownership strategy. Thus the transaction cost explanation for entry decision has been strongly supported while its explanation for ownership strategy becomes reversed. In addition, firm size plays a positive role for entry decision but a negative role for ownership levels. Finally, Keiretsu is not related to entry decision and ownership levels. The following subsection tests the robustness of these estimation results.

## 4.2 Entry Decision

The probit estimation results for entry decision of all companies are reported in Table 5. As the baseline model shows, age is negatively related to entry decision, supporting an ecological view. Two main variables which reflect intangible assets, advertising intensity and R&D intensity, show robust and significant estimation results, showing positive and significant coefficients after industry dummies are controlled for. First, the advertising intensity is not consistently significant. This variable plays a positive role for Specifications (4), (5), and (6) after industry dummies are included while it is not significant for Specifications (1), (2) and (3) without industry dummies. However, another variable, R&D intensity, is shown to be positive and significant for all model specifications.

In addition, Table 5 includes the ownership structure of parent companies which reflect corporate governance. The all shareholders, foreign and individual investors and financial institutions, tend to increase the incentive to invest abroad. As one of other control variables, the size of parent companies tends to show a positive and significant coefficient, implying that the size of parent company is positively related with the incentive to invest abroad. The ratio of exports to sales shows a positive coefficient and thus the conventional



Table 5: Entry Decision

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign	1.983 (5.27)**	1.832 (3.95)**	1.080 (2.45)*	1.402 (4.41)**	1.439 (3.78)**	1.241 (3.10)**
Individual	-0.110 (-0.47)	-0.187 (-0.67)	0.151 (0.57)	0.470 (2.33)*	0.532 (2.21)*	0.442 (1.76)
Finance	1.521 (6.38)**	1.250 (4.46)**	1.050 (3.76)**	1.327 (6.35)**	1.235 (4.95)**	1.086 (4.09)**
Age	-0.074 (-0.99)	-0.175 (-1.82)	-0.201 (-2.12)*	-0.323 (-4.61)**	-0.227 (-2.71)**	-0.170 (-1.85)
Advertising	-0.784 (-0.75)	0.178 (0.17)	1.440 (-0.05)	2.647 (2.25)*	2.975 (2.01)*	2.349 (1.76)
Firm size	0.451 (20.92)**	0.424 (16.09)**	0.473 (20.83)**	0.582 (29.83)**	0.561 (24.39)**	0.528 (22.01)**
Keiretsu	-0.102 (-1.73)	-0.034 (-0.48)	-0.019 (-0.27)	0.068 (1.29)	0.078 (1.22)	0.066 (0.94)
R&D		5.406 (4.74)**	2.270 (2.32)*		5.018 (3.84)**	3.705 (2.90)**
Exports			1.689 (10.22)**			0.721 (5.12)**
Constant	-6.372 (-18.78)**	-5.690 (-13.53)**	-6.277 (-15.02)**	-7.654 (-22.28)**	-7.737 (-18.59)**	-7.263 (-15.79)**
year dummies	included	included	included	included	included	included
industry dummies				included	included	included
observations	33,500	19,945	15,743	33,500	19,928	15,743
R-squared	0.34	0.29	0.32	0.41	0.36	0.34

Note: 1) Robust z statistics are in parentheses. 2) \* significant at 5%; \*\* significant at 1%.

Table 6: Ownership Strategy

	(1)	(2)	(3)	(4)
Foreign	-2.153 (-5.77)**	-2.315 (-4.52)**	-1.495 (-3.86)**	-2.093 (-4.08)**
Individual	0.612 (2.33)*	0.622 (1.91)	0.893 (3.31)**	0.852 (2.56)*
Finance	-1.623 (-6.62)**	-1.644 (-5.64)**	-1.716 (-6.67)**	-1.952 (-6.28)**
Age	0.544 (10.06)**	0.604 (8.89)**	0.634 (10.27)**	0.620 (7.63)**
Advertising	-4.183 (-2.49)*	-4.573 (-2.34)*	-4.488 (-2.43)**	-5.857 (-2.79)**
Firm size	0.039 (3.31)**	0.032 (1.99)	0.021 (1.29)	0.037 (1.71)
Institution	0.300 (10.45)**	0.306 (8.47)**	0.283 (9.87)**	0.289 (8.01)**
GDP/100	-0.332 (-11.47)**	-0.346 (-9.61)**	-0.315 (-10.95)**	-0.325 (-9.09)**
Keiretsu	0.087 (1.37)	-0.450 (-0.61)	-0.092 (-1.42)	-0.198 (-2.43)*
R&D		-2.801 (-2.56)*		-2.243 (-1.57)
year dummies	included	included	included	Included
industry dummies			included	included
observations	7,223	5,003	7,223	5,003
R-squared	0.79	0.78	0.79	0.78

Note: 1) Robust z statistics are in parentheses.

2) \* significant at 5%; \*\* significant at 1%.

view on the trade-off relation between FDI and exports is not supported empirically.<sup>10</sup> Another control variable, Keiretsu, is not shown to be significant.

### 4.3 Ownership Strategy

The ownership strategy by MNEs is tested through a linear regression estimation. Estimation results are reported in Table 6.

<sup>10</sup>In order to consider the possibility that exports and entry decision are jointly determined, specifications (2) versus (3) and (5) versus (6) with and without exports are separately estimated and compared. The estimation results are quite consistent.

First, unlike the estimation results for entry decision in Table 5, after other control variables are added to the baseline model specification, age plays a significant and positive role for ownership strategy. Furthermore the transaction advantage variables, advertising intensity and R&D intensity, show negative and significant coefficients, which are quite inconsistent with the findings of Delios and Beamish (1999) for East and South-East Asian countries.

The income per capita of host countries is shown to be negative and significant. Higher income per capita of the host country means that technology gap with the home country is narrowed so that given institutional environment, MNEs prefer lower level of ownership. Thus these findings support ownership strategy by transaction advantage.

The shareholders of the parent companies play an important role as well. Foreign investors and financial institutions are relatively reluctant to hold more shares of local companies while individual investors do show a significant tendency to hold more ownership. The estimation results are inconsistent with those for entry decision as well. The size of the parent companies shows a positive coefficient, which implies that the larger the parent companies, the higher the ownership they want to hold. The estimation results for the firm size in Tables 5 and 6 imply that larger companies tend to invest abroad and to hold higher ownership levels of local companies.

Another important control variable, institution, shows a positive and significant coefficient, implying that the host countries favorable to MNEs tend to make them hold higher share of local companies which is quite consistent with theoretical background discussed in the first section. Interestingly, Keiretsu is not shown to be significant. Finally, the explanatory power of the extended model becomes much higher than that of the baseline model by increasing from around 0.05 to 0.78.

In general, the hypothesis discussed in Section 2 that ownership strategy is affected by the combination of transaction advantage and institutional environment is well supported. Furthermore, corporate governance is shown to play a significant role.

#### 4.4 A Heckman's Sample Selection Model

As discussed in the introduction, the empirical analysis to investigate determinants of overseas entry decision as well as ownership strategy does not consider the behaviors of other domestic companies which do not join investment abroad and thus the estimation might be subject to a sample selection bias. Thus two step are followed: estimation for the determinants of FDI entry decision by considering all companies (domestic and MNEs) and then estimation of the determinants of ownership strategy of all MNEs.

Table 7 reports the estimation results by following a Heckman's sample selection model.<sup>11</sup> In order to consider the effect of a change in sample size, the probit estimation results for entry decision are reported as well. Since they are quite consistent with those of Table 5, this subsection discusses the estimation results only for ownership strategy. Table 8 reports the estimation results of a sample selection model by manufacturing and non-manufacturing sectors, respectively. Specifications (4) and (5) in Table 5 are used as selection equations, respectively. The exclusion variables for the selection equations are industry and location dummies of parent companies for Specifications (1) and (2) and export ratio to sales of parent companies in addition to two variables used in the previous specifications is for Specification (3).

First, the selection bias is critical since the hypothesis that the coefficient for the inverse of the Mill's ratio (Mills lamda) is equal to zero is rejected for all estimation specifications. Second, the coefficient for manufacturing dummy is not shown to significant, which reflects that the relatively higher ownership level of non-manufacturing sectors in Table 1 is not statistically significant after other variables are controlled for.

Third, unlike the results in Tables 4 and 6, the significant role of age disappeared so that an organizational ecology perspective has not been supported under consideration of a sample selection bias.

Fourth, the variables which reflect transaction advantage are interesting. Transaction advantage variables, advertising intensity and GDP per capita, are shown to be significant for ownership strategy which is consistent with the estimation results in Table 6. However, R&D intensity became less significant than that without considering a sample selection

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<sup>11</sup>The separate estimation results for manufacturing and nonmanufacturing sectors are reported in Table 8.

bias of Table 6. However, if we estimate the same model by manufacturing and non-manufacturing sectors, the coefficients for advertising is shown to be negative and significant for manufacturing sector while R&D intensity is shown to be negative and significant only for non-manufacturing sector (Table 8). Real income per capita is shown to be negative and significant over all estimation specifications even though the absolute value of the coefficient becomes smaller. Thus if we assume that it reflects the level of productivity of the host country, it can be interpreted that transaction advantage is inversely related with ownership strategy after other variables are controlled for. From these findings, we cannot reject the role of transaction cost approach.

Fifth, the results on the ownership structure of the parent company are shown to be different from the results by estimation without consideration of a sample selection bias in Table 6. If we consider a sample selection bias, while foreign investors show the same estimation results, individual investors and financial institutions do show different results. Individual investors tend to hold lower ownership levels under considering a sample selection bias while they tended to hold higher ownership levels without considering a sample selection bias. In addition, financial institutions do not show a significant coefficient if a sample selection bias is considered which is in contrast with the results of Table 6. In addition, the absolute coefficient for foreign investors becomes smaller. The estimation results for foreign investors are clarified by the estimation by sectors. As Table 8 shows, the coefficient for foreign investors is higher for non-manufacturing sector.

Sixth, as in all other estimation results, institution variable is positive and significant for ownership strategy even though the value of the coefficient decreases under consideration of a sample selection bias. Furthermore, it is shown that the institution variable is quite robust over all estimation techniques and model specifications. In addition, the size of the parent company plays a positive and significant role for ownership decision over all estimations. The role of firm size is strengthened under consideration of a sample selection bias showing that the coefficient rises from about 0.03 in Table 6 to 0.20 in Table 7.

## 5 Conclusion

Using 20-year panel data, this paper tests Japanese companies' sequential decisions: (1) to invest abroad or not and (2) if they decide to invest abroad, what ownership strategy for that local company to be employed.

Through Heckman's two-step estimation procedure, corporate governance plays an important role for entry decision but not for ownership strategy decision. Foreign investors and financial institutions tend to invest abroad while individual investors do not. However, they do not affect the ownership strategy in the host countries. Financial institutions are shown to prefer lower ownership levels without considering a sample selection bias but their role disappear otherwise.

Second, transaction cost approach is well supported for entry decision but for ownership decision. Advertising and R&D intensities show positive relation with the decision to invest abroad. For ownership strategy, advertising intensity is inversely related with ownership levels while R&D intensity is not shown to be significant. In addition, real GDP per capita as an approximation of productivity level of host country is shown to be negative and significant for ownership strategy.

Third, most importantly, the institutional environment favorable to MNEs leads to higher level of ownership of local companies. Fourth, firm size plays a positive and significant role for entry decision as well as ownership strategy. Fifth, firm age plays a significant role for entry decision, supporting an organizational ecology perspective. Finally, Keiretsu is not shown to be significant for entry decision as well as ownership strategy.

In conclusion, under consideration of a sample selection bias, institutional environment is shown to be more important than transaction variables for ownership strategy. In addition, as a part of transaction variables, per capita GDP of the host countries is an important determinant of ownership strategy. Thus the hypothesis that entry choice and ownership strategy are determined by a combination of transaction cost approach and institutional environment is well supported. And once the corporate governance of the parent company which is shown to be significant for entry decision is controlled for, we find that firm age becomes less important in explaining entry decision as well as ownership strategy.

Table 7: A Sample Selection Model

	(1)		(2)		(3)	
	decision	ownership	decision	ownership	decision	ownership
Foreign	1.680 (10.30)**	-1.563 (-4.91)**	1.804 (8.80)**	-1.909 (-4.21)**	1.285 (5.78)**	-1.933 (-4.13)**
Individual	0.290 (2.47)*	-0.819 (-3.24)**	0.348 (2.35)*	-0.447 (-1.35)	0.400 (2.45)**	-0.432 (-1.24)
Finance	1.309 (11.99)**	-0.360 (-1.54)	1.300 (9.61)**	-0.491 (-1.61)	1.176 (7.93)**	-0.378 (-1.18)
Age	-0.337 (-9.89)**	0.061 (0.98)	-0.257 (-5.96)**	0.776 (0.90)	-0.229 (-4.52)**	0.106 (1.15)
Advertising	3.304 (5.42)**	-5.587 (-4.09)**	3.859 (5.45)**	-5.948 (-3.59)**	2.195 (2.39)**	-5.938 (-3.10)**
Firm size	0.552 (59.81)**	0.183 (7.74)**	0.519 (43.61)**	0.230 (6.96)**	0.535 (38.70)**	0.255 (7.32)**
Institution		0.194 (7.85)**		0.205 (6.18)**		0.204 (5.99)**
GDP/100		-0.279 (-11.53)**		-0.287 (-8.95)**		-0.297 (-9.01)**
Keiretsu	0.580 (2.10)*	0.029 (0.55)	0.039 (1.12)	-0.066 (-0.92)	0.056 (1.44)	0.002 (0.03)
R&D			5.466 (7.26)**	-0.342 (-0.32)	3.692 (4.63)**	-0.147 (-0.13)
Exports					1.048 (8.93)**	
=1 if manufacturing		0.001 (0.03)		0.149 (1.71)		0.115 (1.21)
Constant	-7.966 (-33.43)**	0.410 (0.88)	-7.982 (-27.95)**	-0.542 (-0.85)	-6.218 (-11.10)**	-1.156 (-1.74)
year dummies	included	included	included	included	included	included
industry dummies	included		included		included	
Prefecture dummies	included		included		included	
Mills lamda	0.796 (10.46)**		0.908 (8.69)**		1.091 (9.73)**	
rho	0.458		0.492		0.579	
sigma	1.738		1.846		1.884	
observations	32,862		19,549		15,377	

Note: 1) Robust z statistics are in parentheses. 2) \* significant at 5%; \*\* significant at 1%.  
3) Mills lamda is rho multiplied by sigma.

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Table 8: Ownership Strategy by A Sample Selection Model by Sectors

	Manufacturing		Non-manufacturing	
	(1)	(2)	(3)	(4)
Foreign	-0.631 (-1.50)	-1.513 (-2.99)**	-2.304 (-4.14)**	-4.422 (-3.69)**
Individual	-0.472 (-1.41)	-0.260 (-0.69)	-1.254 (-3.19)**	-1.449 (-1.97)*
Finance	-0.373 (-1.13)	-0.688 (-1.92)	0.391 (1.16)	-0.522 (-0.79)
Age	0.024 (0.26)	0.133 (1.28)	0.048 (0.59)	0.036 (0.21)
Advertising	-4.775 (-2.72)**	-5.527 (-2.85)**	-2.704 (-1.18)	-1.963 (-0.60)
Firm size	0.241 (6.35)**	0.198 (4.27)**	0.077 (2.55)*	0.183 (3.46)**
Institution	0.225 (6.82)**	0.234 (6.15)**	0.129 (3.64)**	0.086 (1.31)
GDP/100	-0.318 (-9.86)**	-0.326 (-8.84)**	-0.191 (-5.48)**	-0.110 (-1.76)
Keiretsu	-0.029 (-0.45)	-0.077 (-0.96)	0.306 (2.66)**	0.031 (0.16)
R&D		1.479 (1.27)		-17.816 (-3.44)**
Constant	-0.746 (-1.15)	-0.400 (-0.54)	2.061 (3.31)**	48.370 (1.89)
year dummies	included	included	included	included
mills lamda	1.150 (8.27)**	1.027 (7.70)**	0.391 (3.92)**	0.534 (3.20)**
rho	0.455	0.533	0.276	0.350
sigma	42.187	1.928	1.417	1.527
observations	20,761	15,207	12,101	4,342

Note: 1) Robust z statistics are in parentheses.

2) \* significant at 5%; \*\* significant at 1%.

3) Mills lamda is rho multiplied by sigma.

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Table A1: The Correlation Matrix

	Foreign	Individual	Finance	Age	Advertising	Firm size
Foreign	1.0000					
Individual	-0.3080	1.0000				
Finance	0.1021	-0.3211	1.0000			
Age	0.0468	-0.1398	0.3120	1.0000		
Advertising	0.0314	0.1063	-0.0320	-0.0327	1.0000	
Firm size	0.2476	-0.3299	0.5121	0.1421	-0.1702	1.0000
Institution	-0.0195	0.0098	-0.0155	-0.0169	0.0132	-0.0753
GDP	-0.0401	0.0404	0.0088	-0.0731	0.0791	-0.1028
Keiretsu	-0.1068	0.0534	0.1174	0.0966	-0.3306	0.1563
R&D	0.2339	-0.0403	0.1070	0.1668	0.2393	-0.0452
Exports	0.1794	-0.0408	-0.0133	-0.1506	0.0771	-0.0198

	Institution	GDP	Keiretsu	R&D	Exports
Foreign					
Individual					
Finance					
Age					
Advertising					
Firm size					
Institution	1.0000				
GDP	0.8440	1.0000			
Keiretsu	-0.0202	-0.0314	1.0000		
R&D	0.0656	0.0851	-0.0760	1.0000	
Exports	0.0046	0.0646	-0.0178	0.1715	1.0000

Table A2: Descriptive Statistics

	80-84	85-89	90-94	95-99
Foreign	0.040 (7,269)	0.040 (9,693)	0.041 (11,734)	0.061 (13,621)
Individual	0.319 (9,680)	0.273 (11,380)	0.247 (12,966)	0.250 (14,054)
Finance	0.241 (8,785)	0.279 (10,392)	0.297 (12,081)	0.282 (13,742)
Age	3.656 (8,727)	3.744 (10,956)	3.826 (11,686)	3.932 (12,712)
Advertising	0.009 (9,382)	0.009 (10,903)	0.010 (12,332)	0.009 (12,967)
Firm size	10.489 (10,499)	10.852 (12,123)	11.204 (13,453)	11.435 (14,189)
Institution	6.908 (1,759)	7.373 (4,432)	7.007 (5,763)	7.272 (7,273)
GDP/100	4.051 (1,886)	4.204 (4,437)	3.735 (5,872)	3.519 (7,291)
Keiretsu	0.843 (8,861)	0.845 (10,845)	0.839 (11,299)	0.839 (12,173)
R&D	0.010 (4,759)	0.015 (5,951)	0.016 (7,002)	0.017 (7,643)
Exports	0.139 (5,782)	0.135 (6,796)	0.126 (7,519)	0.142 (8,449)

Note: the number of companies are in the parenthesis.