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TO UNDERTAKE FOREIGN DIRECT INVESTMENT

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Abstract: This paper investigates the empirical determinants of the initial FDI entry decisions by Japanese firms to enter into the U.S and Taiwanese markets. The study is based on a full-sample survey of firms listed on Japanese stock exchanges and is for the period 1976-2000. We find that a number of macro/financial as well as micro (company-specific) variables are highly significant in explaining the observed entry pattern.

JEL Classification: F2, F3

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1. Introduction

Japanese foreign direct investment (FDI) has attracted much attention during the past quarter century as the country has become one of the largest suppliers of FDI in the world. Despite the difficulties encountered in the post-bubble adjustment of the past decade, the Japanese economy ranks second in the world in its output production, and also as the source country for cumulative in-bound FDI into the United States.

Economists have focused on various aspects of Japan's FDI, and there is now a large literature on this topic.¹ Most of the empirical literature on Japanese FDI has used fairly aggregative industry-level or macro data. In contrast, there have been relatively few studies that use company-level data, and those that do pertain to only a handful of manufacturing industries. The motivation of this study is to undertake a full-sample survey of all firms listed on all eight Japanese Stock Exchanges (Tokyo, Osaka, Nagoya and five other minor local exchanges) over the period 1976-2000. We carefully checked the data source discussed below to find if, and when, each company made the first FDI entry. We then test the statistical link between the observed pattern of the initial FDI decisions and some of the financial and non-financial variables that have appeared in separate literature.

Given the complexity and the diversity of issues and hypotheses that have been offered in the literature, our approach is an eclectic one that combines a number of explanatory variables, but focusing specifically on the initial FDI entries. Our motivation is to focus on the initial decisions, rather than on the value of FDI as in most other studies that do not differentiate between the initial move and subsequent ones for further investment. Once the commitment is made with the

¹ See Caves (1993) for the literature survey and the reference citations. The works that have appeared in print since then that are relevant here include Pugel, Kragas and Kimura (1993), Trevino and Daniels (1994), Azrak and Wynne (1995), Kojima (1995), Yamawaki (1995), Eaton and Tamura (1996), Kogut and Chang (1996), Belderbos and Sleuvaegen (1996, 1998), Kumar (1998), and Barrell and Pain (1999).

initial entry, the well-known hysteresis effect takes hold that alters the incentives structure of FDI to at least some extent.² We avoid that complication by excluding from our observations subsequent re-investment decisions.

2. Hypotheses

We list below hypotheses to be examined in this study, along with a brief justification and background for each. In the statistical section that follows, the issue is whether, and to what extent the proffered explanations have relevance for the initial FDI decisions.

(a) Research and Development

The technology asset possessed by a multinational firm plays a key role in the theory of FDI. The firm can overcome natural disadvantages in operating in a foreign country if it has an opportunity to capitalize on an internationally transportable intangible asset it owns. From the internalization perspectives in the theory of multinational enterprise these intangible assets can be broad, encompassing goodwill, reputation and organizational skills in general that the firm essentially owns. But in particular, technology as proxied by R&D expenditures has been found to be a significant determinant of Japanese (as well as Western countries) FDI in a number of empirical analyses that have been conducted.³

(b) Exchange Rate

The link between exchange rates and FDI has been debated extensively. On the theoretical grounds, if the international capital market is reasonably open and efficient, changes in the exchange rate may fail to impart a systematic cost-of-capital bias to either domestic or foreign investors, as the risk-adjusted expected returns tend to be equalized across investments

² See Dixit (1989), Kulatilaka and Kogut (1996), and Kogut and Chang (1996).

³ The more recent literature on R&D and Japan's FDI includes Kogut and Chang (1991, 1996), Drakes and Caves(1992), Trevino and Daniels (1994), Pugel, Kragas and Kimura (1996).

regardless of their national origin. To the extent that the exchange rate impacts on the current account balance of payments, it does affect the capital account as a whole. However, it leaves the composition of the capital account that includes FDI indeterminate.⁴

On the other hand, changes in the exchange rate impart a wealth bias on the value of foreign assets such that depreciation of the dollar, for example, allows Japanese firms to acquire dollar-denominated assets more cheaply than previously.⁵ This will result in a direct link between exchange rates and FDI from the cost-of-acquisition standpoint. Indeed, empirical studies have generally supported the link between exchange rates and Japanese FDI.⁶

(c) *Liquidity*

It is generally accepted that liquidity matters in investment decisions.⁷ It matters because firms face finance constraints that increase the costs of external finance relative to internal finance on account of asymmetric information between borrowers and lenders, or simply because of transaction costs involved in generating external finance. Liquidity may also contain useful information regarding the future profitability of the firm, thus impacting on current investment decisions. Whereas those links are well established on the theoretical grounds, the current controversy pertains to the measurement problem. In particular, how does one capture the finance constraints of the firm? Does the empirical relationship between cash flow and corporate investment adequately reflect the presence of the firm's financial constraints? The evidence is

⁴ This argument dates back to Mundell (1968).

⁵ Froot and Stein (1991) argue that FDI is information-intensive in the sense of asymmetric information, and that it is subject to different financing requirements than portfolio investment that may be readily financed with external funds.

⁶ See Caves (1989), Froot and Stein (1991), Drake and Caves (1992), and Kogut and Chang (1996). However, exceptions are Ray (1988) and Healy and Palepu (1993).

⁷ See Chirinko (1993) and Chirinko and Schaller (1995) for reference citations in this rapidly expanding literature.

not clear, and there is an on-going controversy on this question.⁸ The issue that is relevant to this study, then, is whether there is an empirically meaningful relationship between the firm's liquidity as represented by cash flow and its decision to invest abroad.

(d) *Business Groups*

One of the most frequently mentioned "unique" aspects of Japan's business system are the inter-firm relationships known as *kigyo keiretsu*. Literally translatable as enterprise affiliation, it is a network of companies drawn typically from different industries and a primary bank as lender and leader of the group (horizontal keiretsu). Alternatively, the network may be more narrowly focused in an industry (e.g., the auto industry), comprising subcontractors and the main contractor (vertical keiretsu). The networking encourages cooperation through mutual cross-shareholding among member companies, mutual assistance and information-sharing.⁹

Presumably, it is easier to undertake FDI for the first time if some of the member companies have already made that move and are willing to share information about the host country's market. It will lower the fixed cost of entry in the host country by reducing the uncertainty risk, and it may also relax the capital constraints.¹⁰

(e) *Agency Cost*

An extensive finance literature suggests that corporate diversification including FDI has both benefits and costs for shareholders. With respect to FDI, the evidence is mixed as to whether international operations enhance firm value. Some of the earlier literature demonstrated both on theoretical and empirical grounds that there is a positive valuation effect for multinational firms

⁸ See Kaplan and Zingales (1997) and Fazzari, Hubbard and Petersen (2000) for the opposing views.

⁹ It should be noted, however, that this practice may not be particularly profitable. See Weinstein and Yahesh (1995), for example, for the more recent evidence. They argue that the keiretsu was not collusive and that the individual firms remained competitive.

¹⁰ See Hoshi, Kashyap and Scharfstein (1991) for the capital constraint argument.

relative to purely domestic ones from having the option to operate internationally.¹¹ On the other hand, the more recent literature finds evidence that points in the opposite direction.¹²

In a parallel development emphasizing agency cost, an explanation has been offered as to why firms diversify internationally even as it decreases the market valuation of the firm. The agency cost hypothesis posits in the principal-agent context that diversification may benefit managers for various reasons including prestige that comes from managing an internationally diversified firm, managerial compensation that may be tied to firm size, and the perception that managers may become more indispensable on account of an overseas exposure. Denis, Denis and Sarin (1997), for example, find empirical evidence that shows that the firm's diversification is in fact related negatively to the extent of managerial equity ownership in the firm they manage. The issue we investigate here is whether the likelihood of Japanese corporate decisions to make an FDI entry is related to managerial equity ownerships, the underlying question being whether Japanese firms behave similarly to the U.S. firms in this respect.

(f) Firm Size and Years in Operation

FDI typically entails a substantial overhead investment at the entry point, requiring the firm to be of a sufficient size to be able to raise the necessary capital. Most of the studies related to the firm size question confirms a positive association between firm size and FDI. As noted by Caves (1993, p.289), an intriguing issue related to the size question is how small and medium-sized Japanese subcontractors have undertaken FDI following their main contractor. A tangential issue may be the length of time the firm has been in operation before deciding to extend its operations overseas. In this context, the number of years elapsed since the firm's

¹¹ Errunza and Senbet (1981, 1984), Kim and Lyn (1986).

¹² See in particular Christophe (1997) and Denis, Denis and Yost (2002).

inception serves as a proxy for the firm's cumulative experience and the human capital associated with that experience.

(g) Exports and FDI

In the standard Heckscher-Ohlin trade model the substitutive relationship between trade and international factor movement is emphasized. The substitutive relationship stems from the argument that in a world characterized by perfect competition and no transportation cost, international equalization of factor prices may be achieved at equilibrium either through trade with no international factor movement, or through factor movement with no trade.¹³ Concerning trade and foreign investment, however, empirical evidence that has been accumulated during the past thirty years suggests that the two are complements.¹⁴

An evolutionary model of trade and investment emphasizes that a firm first gains foothold in the host country's market by exporting its product. Only when the firm accumulates sufficient information through its export experience that profitable opportunities exist for investment, does the firm ratchet up its commitment to that market through FDI. Does there in fact exist a statistically significant relationship between previous exports and the initial FDI decisions from the full-sample Japanese firms?

3. Statistical Model and the Data

We apply the partial maximum-likelihood hazard-rate estimation model to assess the likelihood of a firm to make the initial move to invest abroad. Let $h_{ij}(t)$ be the hazard rate at time

¹³ See Mundell (1968).

¹⁴ See the extensive references cited in Drake and Caves (1992).

t, representing the transition rate from the no-FDI state i to the FDI state j at time t. The multivariate Cox proportional hazard model assumes that $h_{ij}(t)$ is of the exponential form,

$$h_{ij}(t) = h_0(t) \exp[\beta X(t)]$$

where $h_0(t)$ denotes the baseline hazard rate that is unspecified but is assumed to be identical for all states. The column vector X contains time-varying covariates and β is the corresponding row vector of coefficients to be estimated. The proportional hazard model specifies the probability of the firm's initial FDI to be the likelihood that the observed incidence of FDI should have occurred, given the hazards of all firms in the risk set. This leads to the partial likelihood function to be maximized as follows:

$$L(\beta) = \prod_{i=1}^n \left[\frac{\exp(\beta X_i)}{\sum_{j \in R} \exp(\beta X_j)} \right]^{k_i}$$

where R is the risk set containing all censored firms as of the beginning of each calendar year t, and $k_i = 1$ if a firm makes the FDI move during t, and $k_i = 0$ otherwise. Hence, information about past decisions enters into the calculation of the risk set, and this allows for the conditional probability estimation.¹⁵

The sample period is 1976-2000. The sample contains 2,417 companies that were listed on the Japanese stock exchanges during this period. Of these, 537 companies made the initial FDI move destined to the U.S., by far the largest destination country for Japanese firms. The largest destination area in Asia was Taiwan, with the total of 309 companies making the initial move during this period. For the comparative purpose, we estimate the model for each of these two economies separately.

¹⁵ The estimates obtained from this partial maximum-likelihood estimation are both consistent and asymptotically normally distributed. See Cox and Oakes (1984).

The company-by-company data on FDI, taken from Toyo Keizai Shinposha's *Kaigai Sinshutsu Kigyō Soran* (2001), are for green-field and acquisition (20% or higher equity acquisitions) investments. There were relatively few firms that had invested in either country prior to 1976, causing no serious left-censoring problem in the estimation.

The measurement of explanatory variables used in the study and the respective data source follows. The explanatory variables are entered into the estimation equation with the lag of one year.

RD: Research and development spending divided by the firm's total value added.

Source: *Nikkei NEEDS Zaimu Data* (CD-ROM), 2000.

CASH: Total cash flow is evaluated as income after tax + depreciation allowances + provisions for the future lump-sum retirement benefit payments – net increase in inventory – increase in accounts receivable + increase in accounts payable; the total cash flow is then divided by the firm's total assets to arrive at our CASH variable. (We include dividends in the cash flow on the ground that Japanese managers have a large discretion over the dividend policy that is not subject to the pressure from stockholders to the extent that the U.S. firms are. Indeed, the dividend rates are low in Japan, and in reality, inclusion or exclusion of dividends makes little difference to the statistical results that follow.)

Source: *ibid.*

SIZE: The relative size of the firm is measured as the firm's total sales divided by the industry total sales. Source: *ibid.*

YRS: The number of years the firm was in operation since its inception. The inception year is from Toyo Keizai Shinposha, *Kaisha shiki-ho* (Quarterly Company Reports), No.3, 2001.

KEI: Horizontal *keiretsu*. KEI = 0 if the firm did not belong to one of the six major groups

(Mitsui, Mitsubishi, Sumitomo, Fuyo, Sanwa, and Dai-ichi). For a member firm, KEI = the proportion of the group members that are already operating in the host country.

Source: Toyo Keizai Shinposha, *Kigyo keiretsu soran*, 1994.

RET: Vertical *keiretsu*. RET = 1 if the leading firm in the group was operating in the host country at the time the subcontracting firm made the initial FDI in that country.

Source: *ibid.*

OWN: The proportion of the firm's outstanding shares owned by the current managers. Source: *Nikkei NEEDS Zaimu, op. cit.*

EXCH: The real effective exchange rate of the Japanese yen. Source: International Monetary Fund, *Financial Statistics*, 2002.

EXPO: Exports from Japan to the host country, proxied by the proportions of the industry total output exported to the host country. Toyo Keizai's company files do not contain information on company exports. We use this proxy on the assumption that the Japanese firm's business decision on the initial foreign investment is influenced by the industry's overall export orientation. Source: Data on exports by industry are taken from OECD's *International Trade by Commodity Statistics*, various issues.

INT: Capital intensity defined by the firm's tangible fixed assets divided by the number of employees. One abnormality of Japan's FDI noted by Ray (1988) is that whereas the investment pattern of Japanese firms tracks the Western countries' pattern in key variables such as R&D and industry concentration, Japanese investments differ in that they are not capital-intensive. We include this variable to see if that finding may hold relevance in the present study. Source: *Nikkei NEEDS Zaimu, op. cit.*

4. Statistical Results

The table presents the estimation results obtained for Japanese FDI in the U.S. and Taiwan, respectively. In both cases, R&D, cash flow, the relative size, horizontal as well as vertical keiretsu, export orientation and the real exchange rate are found to have statistically significant influence on the likelihood of the initial FDI decisions with the “correct” sign. The degree of consistency obtained in the statistical results between the two disparate economies of the U.S. and Taiwan is remarkable. Appendix table 1 presents the correlation matrix for the explanatory variables, and it is evident that there is no serious multi-collinearity problem.

The agency cost hypothesis, on the other hand, does not hold up. The result is statistically insignificant in both cases. Therefore, there is little support to the notion that the FDI decisions are influenced by managerial ownerships of the firm’s equities. To the extent that there is an empirical support for this hypothesis for U.S. firms, our findings indicate an indirect support to Aoki’s (1988) argument that in Japanese firms the interests of managers, stockholders and workers employed by the firm tend to merge as stakeholders in sharp contrast to U.S. firms.

Likewise, there is little statistical support for the length-of-time hypothesis. On the other hand, there is some support for the factor-intensity argument. The coefficients of the capital-labor ratio are negative in both instances, and highly significant in the case of Taiwan. This suggests that controlling for the other variables in the model, labor-intensive firms are more likely to invest than capital-intensive firms. Surprising as this finding may initially seem, it does agree with the fact that a large portion of Japanese FDI is by small and medium-sized business establishments.¹⁶ This tendency for labor intensity is particularly strong in the case of Taiwan,

¹⁶ In an earlier study of Japanese FDI in the U.S., Ozawa (1979) found that as much as one half of Japan’s FDI is by small and medium-sized firms.

where service-oriented and other labor-intensive industries are more prevalent in FDI activities. They are there, presumably to take advantage of cheaper wages prevailing in Taiwan.

5. Summary and Conclusions

We have brought together a host of financial and non-financial explanations to bear on the initial decisions made by Japanese firms to invest abroad. Based on the full-sample data spanning the last quarter of the 20th century, a period in which the Japanese economy underwent a turbulent transformation from a high growth to a distinctly low growth period that included the bursting of a major speculative bubble, we find that it is remarkable that some of the financial/macro variables do as well as they do in explaining the individual firms' initial FDI entry decisions, whether these decisions pertain to investment into the U.S. or Taiwan. Company-specific variables such as R&D, liquidity as proxied by cash flow, the relative firm size, and memberships in keiretsu groups are also found to be quite relevant. On the other hand, the agency cost hypothesis that has been offered to explain the behavior of U.S. firms is found to be largely irrelevant in addressing the Japanese FDI decisions. The convergence of Japanese business practice and behavioral pattern to that of the western nations has been noted in many studies, but with respect to the FDI, that trend certainly is not across the board.

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Table. Cox Regression for Initial Entry FDI Decisions, 1976-2000

Covariates	U.S.-bound FDI				Taiwan-bound FDI			
	Coefficient	Wald ² (<i>p</i> -stat)	Transition Rate	Summary	Coefficient	Wald ² (<i>p</i> -stat)	Transition Rate	Summary
RD	0.304	179.2 (0.000)	1.35		0.088	10.3 (0.001)	1.09	
CASH	0.117	6.6 (0.010)	1.12		0.152	6.4 (0.011)	1.16	
SIZE	0.167	28.0 (0.000)	1.18		0.179	26.6 (0.000)	1.19	
YRS	-0.021	0.2 (0.673)	0.97		0.077	1.5 (0.220)	1.08	
KEI	2.052	101.0 (0.000)	7.78		2.134	22.7 (0.000)	8.44	
RET	0.412	11.5 (0.001)	1.51		0.480	6.9 (0.008)	1.61	
OWN	-0.060	1.3 (0.250)	0.94		-0.001	0.0 (0.986)	0.99	
EXCH	-0.080	228.1 (0.000)	0.92		-0.084	122.3 (0.000)	0.91	
EXPO	0.361	102.0 (0.000)	1.43		0.197	15.3 (0.000)	1.21	
INT	-0.124	2.6 (0.106)	0.88		-0.433	8.3 (0.004)	0.64	
-2logL				9728.4				5747.9
Chi-square				892.3				257.9
Degrees of freedom				10				10
Significance level				<0.0001				<0.0001

Appendix Table 2. Distribution of FDI Firms by Industry and Period

	For the U.S						For Taiwan					
	1976-80	81-85	86-90	91-95	96-2000	total	1976-80	81-85	86-90	91-95	96-2000	total
Agriculture, forestry and fisheries	2	0	1	0	1	4	0	0	0	0	0	0
Mining	0	1	0	1	2	4	0	0	1	0	0	1
Food and food products	2	6	7	6	4	25	0	0	9	4	1	14
Textiles	2	4	3	1	3	13	0	0	4	1	0	5
Pulp and paper	2	2	3	0	1	8	0	0	1	1	0	2
Chemicals	15	11	33	13	11	83	5	6	15	5	5	36
Petroleum and coal products	0	2	2	0	0	4	1	0	1	0	2	4
Rubber, glass, stones	1	3	10	3	4	21	2	1	12	3	3	21
Primary metals	3	3	13	5	3	27	0	1	7	1	1	10
Metal products	4	2	5	2	3	16	2	0	3	0	3	8
Machinery (non-electric)	12	17	19	10	11	69	2	5	11	11	7	36
Electric machinery	19	21	21	8	8	77	5	4	24	6	17	56
Transportation equipment	5	9	27	1	5	47	7	5	6	2	4	24
Precision machinery	4	2	4	1	1	12	3	0	1	2	1	7
Other manufacturing	1	6	3	4	7	21	0	1	3	2	3	9
Construction	2	6	15	3	2	28	0	1	5	2	1	9
Electricity, gas, water	0	0	0	1	0	1	0	0	0	0	0	0
Commerce	4	6	13	7	9	39	3	4	17	16	14	54
Real estate	0	1	2	0	0	3	0	0	0	0	0	0
Transportation and Communications	4	4	10	2	1	21	0	2	4	0	3	9
Other services	0	4	3	5	2	14	1	1	2	0	0	4
Total	82	110	194	73	78	537	31	31	126	56	65	309