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Ming-Wen Hu • Chia-Jung Lin

Professor • Graduate student

Department and Graduate Institute of Industrial Economics

Tamkang University

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Chia Yi: National Chung Cheng University, Department of Economics

Locational and Industrial Choices of Taiwanese Outward FDI*

By **M**ING-**W**EN **H**U AND **C**HIA-**J**UNG **L**IN**

Taiwan has now been brought into a new phase of development involving ever-increasing liberalization and globalization. This study sets out to highlight the character of Taiwan's multinationals, in terms of their participation in outward capital investment. Using the 2001 survey data compiled by the Ministry of Economic Affairs in Taiwan, we set up a bivariate Probit regression model to empirically examine locational and industrial choices. Our empirical results indicate that a firm originated from information and electronics industries, characterized by its involvement in R&D-related activities, and which has a market- driven orientation, a lower level of labor input, and a lower investment in networking, would prefer to penetrate a high-income country. Our findings also suggest that a firm operates domestically in information and electronics industries, holds a R&D sector, emphasizes labor inputs and network involvement will tend to invest overseas in information and electronics industries.

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** Dr. Ming-Wen Hu (胡名雯) is a Professor of Industrial Economics, Tamkang University and corresponding author for this paper. Address for correspondence: Department of Industrial Economics, Tamkang University, 25137 Taipei, Taiwan. Email: humw@mail.tku.edu.tw. Chia-Jung Lin （林佳蓉） is a graduate student of the Graduate Institute of Industrial Economics, Tamkang University.

Ⅰ. Introduction

Foreign direct investment (FDI) is a growing global phenomenon, with inflows and outflows reaching US $1298 billion by year 2002 in terms of the numbers of home and host countries and two-way-flows.[1] Set against such a backdrop, the statistics provided by the IMF World Economic Outlook (1998) demonstrate that since 1996, Asia as a whole, and the 'newly industrialized economies' (NIEs) in particular (including Taiwan) have shifted from being net recipients of private capital into net providers, representing an important turning point in the region's history.[2] Among these nations, Taiwan had accumulated approved outward FDI of US$38.8 billion by January 2004.[3]

When we take a simple look at the industrial structure of Taiwanese multinationals distributed in different host countries (Table 1), we notice that Taiwan's recent outward FDI is focusing on electronics and electronic machinery industries. FDI that flow in these industries account for 39.15% of all cases. As the table shows, the percentage figure is followed in a distance by trade that takes 10.21 per cent of total cases. Furthermore, the cases from the electronics and electronic machinery sector occupied more than half of all cases among three of the top ten areas that Taiwanese FDI focused. They are the US, Hong Kong, and Western Europe, with the corresponding percentage figures 65.79, 54.65, and 61.11, respectively. While in places like China, Malaysia, Philippine, and Singapore, FDI originated from Electronics and

1 See statistics based on its FDI/TNC database and UNCTAD estimates in *World Investment Report* 2003.

2 NIEs include the four Asian dragons (Taiwan, Hong Kong, South Korea and Singapore) and Israel.

3 Data provided by the Investment Commission, Ministry of Economic Affairs, Taiwan.

Electronic Machinery sector is the most important funding source. Electronics and electronic machinery sector takes 38.55 per cent, 27.48 per cent, 42.86 per cent, and 23.52 per cent of all cases in these areas, respectively.

TABLE 1 – DISTRIBUTION OF TAIWANESE APPROVED OUTWARD FDI CASES BY TOP TEN INDUSTRIES AND LOCATIONS (MOST IMPORTANT), 2002 UNIT: %

	Electronics and Electronic Machinery	Trade	Fabricated Metal Products	Plastic Products	Machinery and Equipments	Chemical Products	Textile Mill Products	Wearing Apparel and Accessories	Transport Equipments	Rubber products
Total	***39.15***	***10.21***	***9.83***	***8.32***	***5.29***	***4.70***	***4.21***	***3.08***	***2.70***	***2.48***
China	38.55	7.56	11.18	9.33	5.94	4.63	3.93	2.39	3.16	3.01
US	65.79	15.79	1.97	1.97	3.29	3.29	1.32	1.32	0.66	0.61
Hong Kong	54.65	27.91	2.33	4.65	1.16	6.98	1.16	0.00	1.16	0.00
Vietnam	7.40	3.70	16.67	9.26	3.70	5.56	22.22	12.96	5.56	5.51
Thailand	15.91	6.82	20.45	18.18	6.82	6.82	4.55	4.55	0.00	0.00
Malaysia	27.78	13.89	11.11	5.56	2.78	5.56	2.78	0.00	0.00	2.71
Indonesia	4.00	8.00	20.00	8.00	4.00	8.00	8.00	8.00	8.00	0.00
Philippine	42.86	4.76	14.29	0.00	4.76	0.00	9.52	19.05	0.00	4.77
Western Europe	61.11	33.33	0.00	0.00	5.56	5.56	0.00	0.00	0.00	0.00
Singapore	23.52	5.29	0.00	5.88	0.00	0.00	5.88	0.00	5.88	0.00

Data source: *Survey of Manufacturing FDI*, **Table 2-2, p. 14, Department of Statistics, Ministry of Economic Affairs (2003).**

In the literatures, we find discussions about FDI from many related fields. One stream of the research deducts hypothesis from traditional FDI paradigm, takes FDI a phenomenon that firms exploit firm-specific advantage. Since such asset- exploitation motive often attaches to firm with market power, in many of the studies of FDI, it has also become a widely recognized concept that decisions by firms to engage in outward FDI are mainly attributable to firm size; that is, large firms will tend to be dominant in the field of outward FDI. This line of rational is based on observations mainly from advanced economies. However, the evidence provided from the

developing world, tends to suggest that such a concept does not provide the whole picture.[4]

To supplement these various experiences among countries of different stages of economic development, trade and economic development theories provide another explanation. For example, as an economy grows, its factor endowment and technology will change, and comparative advantage also can be expected to shift from labor-intensive to capital- or technology- or knowledge- intensive products. To profit from the shifting comparative advantage in the context of an ever-growing integrated world economy, the contents of a nation's export or FDI will thus change in accord with its trading partner. There are empirical works demonstrate the locations of FDI are in lines the prediction of trade theory, that in -and -out flow of FDI between countries with different comparative advantage. We may further proceed by focusing on characteristics of individual multinational that are seen as having important roles to play with regard to determining the choice of location for their foreign subsidiaries. One of the important characteristics, that concerns with locational decision, is the industrial settings of the firm that engaging FDI.

To present corresponding empirical evidence, we may take a simple look at the industrial structure of Taiwanese multinationals distributed in different host countries. First, let us make a simple dichotomy of nations by their income level. We define the maturity of a market in terms of the per capita income of an economy, based on the World Bank Analytical Classifications

[4] In 2002, for example, Taiwan's small and medium enterprises (SMEs) represented about 57 per cent of all Taiwanese manufacturers engaging in outward FDI.

(2004). We go on to classify the various host countries, according to their per capita GNI, into two categories, low-middle income countries and high income countries. For the year 2002, the former group is represented by those countries with per capita GNI of below US$9,076, whilst all the remaining countries are collectively classified as the high income group.

Next, we separate industries that Taiwanese multinationals operate in the foreign land into two groups, information and electronics industries[5] – hereafter IE, and non- IE. The former, in contrast to the latter, requires more sophisticated technology, and induce higher- value added. As statistics show, in 2001, of the 2170 Taiwanese firms engaging in overseas investment, 39.7 per cent were in IE.[6] The propensity of these overseas IE operations were set up in the high income countries, in oppose to middle-to-low income countries, was 28.5 per cent, whilst only 10.7 per cent of non-IE overseas operations had a similar focus. These figures reveal that IE firms have a stronger orientation towards high- income countries when reaching decisions on their proposed FDI location. This is a result tallies with above mentioned current literatures.

Although there are many theoretical studies address the issues, not many empirical works discuss specifically the interrelationship between locational and industrial choices of FDI. The main aims of this study are to explore the industrial and locational orientations of Taiwanese outward FDI firms. Our study uses the survey data provided by the Ministry of Economic

[5] According to industry categories set by Department of Statistics, Ministry of Economic Affairs, they are corresponding to electronics and electronic machinery, and precision instruments industries.

6 The original data source was the Ministry of Economic Affairs (MoEA), *Survey on Overseas Investment by Manufacturing Industry* (2002). This survey focuses only on those firms which have gained approval from the MoEA to engage in FDI.

Affairs to empirically examine, within both IE and non-IE firms, the determinants of the choice of location for their proposed outward FDI, i.e., whether these enterprises select high or low income countries as their FDI targets.

The remainder of this paper is set out as follows. The next section provides a review and comparison of the relevant literature in this area. The subsequent section presents the hypotheses and an introduction to the empirical model adopted for this study. The penultimate section summarizes our empirical results, followed in the concluding section by some remarks on our findings.

Ⅱ. Literature Review

The recent dramatic increase in the total amount and the overall spread of overseas investment by multinationals has drawn the attention of many scholars to the topic of locational choice for FDI. Locational choices made by investors from developed countries have been covered extensively within the literature. Drawing on recent empirical researches, we first look at studies involving FDI in and out of the US.

Filippaios *et al.* (2003) set out to examine the attractors of US outward FDI in Australia, New Zealand, Japan, and Korea. In a similar setting, Lall *et al.* (2003) evaluate US long and short term FDI in the Caribbean and Latin America. Yeaple (2003) using data covers 39 countries that received US FDI, and finds that comparative advantage (reflects in human capital and skill labor abundance) explains the outflow of US FDI to the host countries.

Apart from exploit existing technological advantages in a foreign country as suggested by the traditional paradigm of FDI, some suggest that investors access technology from host countries, thus FDI acts as means of technology sourcing. Love (2003) test the technology sourcing hypothesis with FDI flow between the US and major OECD nations. Love failed to provide evidence for technology sourcing in FDI into the US, and admitted that the vest market of the American economy might be the main attraction for foreign investors. Love's results also suggest technological related motives of FDI explain only a fraction of FDI flows. On the other hand, Shan and Song (1997) focus also on the sourcing of technological advantage that explains the inward FDI in the US, use only the biotechnology industry as sample.

There are also many studies focus on behavior of Japanese investors. Mody *et al.* (1999), for example, discussed both the 'drivers' and the 'attractors' of Japanese multinationals in Asia. Urata and Kawai (2000) outlined the characteristics which were largely determinant of the deployment of outward FDI by Japanese firms in forty host countries. Park (2003) uses inter-industry data in the regression analysis to determine internally driving-out factors and externally-inducing factors of Japanese outward FDI. With the focus on three main concerns: labor intensity, technology intensity, and structure of industry, the author finds that the patterns of these factors effect on FDI propensity (measured by the ratio of FDI to sales) are different when FDI is targeted on developed (the US and the Europe) or developing countries. When invest in the developed area, the technology intensity of the industries was emphasized. While in

the developing countries, the more labor intensified an industry was, the higher the FDI propensity.

In an attempt to decide the macroeconomic determinant of outward FDI, Kyrkilis and Pantelidis (2003) use data from both developed European countries and less developed countries. Their results verify the importance of national characteristics such as endowments. They also conclude that the predictions of economic theories are well tested in mature economies, but not in less developed world.

Among those literatures that draw evidence from NIEs, many empirical researches investigate FDI from the perspective of the characteristics of multinationals. Four recent empirical works have focused on such locational decisions, featuring Taiwan as the home country, with the main consideration being the features of the Taiwanese investors. The samples used within three of these studies were collected by the authors. They are Chen and Chen (1998), Chen *et al.* (1995), and Li and Hu (2002). Chen and Chen (1998) examined 146 firms that were actively engaged in outward FDI, with the main empirical methods used in these works being MANOVA and multiple discriminate analysis (MDA).

The empirical data of Chen *et al.* (1995) and Li and Hu (2002) included, as a reference group, firms that were not engaged in overseas investment; suffice it to say therefore, their studies actually focused on the locational choice of 'investment' as opposed to 'FDI' *per se*. From the total of 674 observations, most of which were large firms with annual sales of over NT$500

million, 452 firms were used in the Probit regression to decide the determinants of location, and of these, only 120 firms had been engaged in FDI (Chen *et al.*, 1995).

In the multi-logit model adopted by Li and Hu (2002), of the total of 141 observations, only those enterprises with capital of less than NT$60 million, or with fewer than 200 employees (small- and- medium enterprises, SMEs), were included in the sample set. Sixty of these firms had not been engaged in any overseas investment. Whilst Makino *et al.* (2002) selected 328 Taiwanese firms from a survey of more than 2000 firms provided by Taiwan government, to be tested in their logistic regression analysis.

These studies stand out as demonstrating individual philosophies on locational designation in a rare NIE setting. Chen *et al.* (1995) characterized locational differences according to the wage level of the host country; however, in this particular study, what actually defined low-wage versus high-wage countries was per capita income, with specific reference to Korea. Chen and Chen (1998) considered only four host countries: mainland China, the US, Thailand and Malaysia, although Thailand and Malaysia were thereafter bound together to represent Southeast Asia. In the Li and Hu (2002) study, given that within the total sample there were only 21 observations where FDI was targeted towards locations other than mainland China, the authors went on to differentiate FDI by Taiwanese firms in mainland China as a separate location designation to all other countries. After excluding the single most important investment destination – China, and other NIEs from the data, Makino *et al.* (2002) focused on the

alternative impacts of the motivation of firms in the choice of their investment location in terms of developed countries versus less developed countries.

Although the main topic was similar in all four studies, each had its own emphasis and specific findings. In their examination of Taiwanese firms, Chen *et al.* (1995) distinguished FDI undertaken by firms in the industrialized high-wage countries as being market-oriented, as opposed to investment in the less developed low-wage countries of Southeast Asia, where FDI was seen as labor-motivated. The empirical results indicated that firms with higher R&D intensity levels, or a more rapid firm growth rate, would be more likely to engage in FDI in the high-wage countries. Makino *et al.* (2002) focused on asset-exploitation vis-a-vis asset-seeking nature of investment, and found that when investors care more about market – seeking nature of FDI, they tent to aim at developed countries as investment targets. These findings confirmed both the defensive FDI hypothesis raised by Kojima (1973) and the beliefs originating from the theory of multinationals espoused by Caves (1971).

In exploring the different motivations behind attempts to penetrate either mature or primitive markets, Chen and Chen (1998) emphasized the critical roles played by network linkages and locational choice. Li and Hu (2002) began by estimating a stochastic frontier production function to calculate a measure of technical efficiency, before moving on to estimate the determinants of locational choice for further investment by SMEs.[7]

7 Also focusing on Taiwan's SMEs, Kuo and Li (2003) concerned mainly the determinants of the probabilities of SMEs conducting outward FDI. Their results show that the major factors motivating Taiwanese SMEs to conduct

Ⅲ. Model and Hypotheses

In this study, our main focus is firms' FDI locational decision between nations of different income levels. However, since such decision is inevitably interrelated with the choice of the product to be produced in the destination, here we consider both locational and industrial choices all at once. In order to explore the determinants of Taiwanese firms' FDI locational and industrial choices, we consider the following regression model:

$$Y^* = \beta' X + \varepsilon \tag{1}$$

where Y^* is a vector of two non-observable latent variables, HIC^* and IE^*, representing location and industry - what we must observe, therefore, are dummy variables. Here we consider mainly the choice of location between high and low-middle income counties *(HIC)*, and the choice of industry between IE and non-IE industries *(IE),* defined as:

$HIC=1, \text{ if } HIC^* > 0$; otherwise = 0, and

$IE=1, \text{ if } IE^* > 0$; otherwise = 0 (2),

and X is a vector of observable characteristics of firms that make FDI decisions. Table 2 provides the definitions and notations of these variables.[8] Let the error vector ε in Equation (1) follow bivariate normal distribution; thus a Bivariate Probit model is applied to this study.

FDI in recent years are "utilizing local labor," "expanding markets," and "following major clients."

[8] Basic statistics and matrix of correlation coefficients of these variables are prepared in the Appendix Table 1.

TABLE 2 – DEFINITIONS OF VARIABLES

	Variable	Definition
Dependent		
	HIC	Main FDI- destination is a high income country =1, otherwise 0.
	IE	Overseas subsidiary operation with information or electronics industries =1, otherwise 0.
Explanatory		
1.	DIE	Firms belong to electronics and electronic machinery, and precision instruments industries =1, otherwise 0.
	L/K	Overseas subsidiary producing mainly with labor input = 1, otherwise 0.
2.	RD	Domestic operation with an R&D sector = 1, otherwise 0.
	OTEC	Overseas subsidiary developing own technology = 1, otherwise 0.
	ASSET	Total asset of both domestic and overseas operation, in billion NT dollars.
3.	MARKET	FDI aimed at market potential = 1, otherwise 0.
	TARIFF	FDI for tariff evasion =1, otherwise =0.
4.	MAT	Fellow overseas Taiwanese firm increasing the input supply for overseas operations = 1, otherwise 0.

The explanatory variables used in our model are separated into four categories in accordance with our hypotheses. With our main focus on the locational choice, the hypotheses address mainly about the locational decision. We now turn to the details of these hypotheses.

1. *As oppose to defensive FDI, Taiwan's investors that originated from IE or non- labor intensive sectors, will tend to target on high-income countries as their main destinations for FDI.*

First of all, our main focus is about the conjecture surrounding industry categories. According to Kojima (1978), there are three main motives behind the desire to engage in FDI which involve an orientation towards resources, markets, and factors. As Taiwan's industrialization process intensified, labor cost increased, for investors used to operate in labor-intensive production sectors will now adopt a defensive strategy when undertaking their proposed overseas investment. It is, therefore, assumed that they will tend to choose low-wage and low-income areas as their foreign production bases. For those investors target on high-income destinations, so call defensive- motive of FDI simply do not apply.

As previously contended, from a factor-oriented perspective, labor-intensive firms operate with low technology level in the non-IE sector will invariably prefer to select one of the less-developed countries as their FDI destination in order to take advantage of cheap labor (Lecraw, 1977). By the same token, for those investors producing mainly with labor input will avoiding set up their overseas subsidiaries in a high- wage, high- income nations.

2. *Base on the conventional theory of multinationals, investors with firm-specific advantages will tend to have stronger motivation to penetrate markets in the high- income countries.*

The traditional belief that in general, firms with superior performance will have stronger

motivation to enlarge their operation domain via export or FDI. Since this is a kind of exploitation of certain firm-specific advantages, the profit margin will be larger the more the customer can afford. Thus, when the emphasis is placed on 'expansionary' motives, the multinationals will prefer to penetrate a more mature or a higher income market as their FDI location decisions (Chen and Chen, 1998). In order to capture the essence of the conventional theory on FDI, further variables are added to our empirical work to signify firm-specific advantages, a firms' ability to undertake R&D and its ability to increase asset scale either domestically or in their overseas subsidiaries; such abilities can of course only guarantee success in mature markets.

3. *Multinationals are more likely to be present in the high-income countries when the market access motives prevail.*

According to Dunning (1993), market seeking is one of the main motivations that explain FDI. Makino *et al.* (2002) study Taiwanese outward looking investment and confirm that firms with market- searching motivation will tend to invest in high- income, developed countries. Furthermore, industrial economists often analyze trade flows at the micro, industrial level (Caves, 1971, 1982; Helpman, 1984), they see FDI as one of the alternative strategies when ambitious firm try to sell a product in more than one country. In order to access foreign market, firms weigh the tradeoff between exports and FDI. When compared with export sales, one advantage of opening a foreign plant is the evasion of tariff, this consideration will affect mainly market

oriented FDI.[9] Any willingness to expand the scale of a firm's operations also indicates that the firm is confident about the buoyancy of the economy. Such behavior implies that firms will aim at the high-income countries in an effort to engage in expansionary FDI.

4. *When networking is important for firms engaging FDI, they will tend to shy from high-income countries.*

Issues surrounding different forms of network linkages are widely emphasized within much of the literature on FDI.[10] Many of them address, in particular, issues involved with locational choice. For example, Head *et al.* (1995) emphasize vertical linkage of firms in explaining Japanese firms distributed within the US territory. Lin (1999) noted that Japanese multinationals invariably prefer joint ventures with foreign producers as a means of enhancing their relationships with local governments, particularly in the less-developed countries. When it comes to the issue about the decision made by a Taiwanese firm, it must be further noted that when a network bond has a clear association with certain social or cultural underpinnings, it will tend to be location specific. For Taiwanese firms, the formation of any of these types of network relationships occurs only in the less- developed neighboring countries. For example, when the emphasis is on geographic proximity, investors might prefer to locate closer to their fellow venturers for input supply. In such case, Taiwanese firms will refrain from operating in remote

[9] Yeaple (2003) considers mainly advanced economies, and confirms that tariffs of EU explain the flow of US outward FDI

[10] For example, Urata and Kawai (2000), Chen and Chen (1998), and especially about small business: Hyder (2000).

high- income countries in order to be closely involved in certain network relationships. Conversely, there is no necessity whatsoever for firms to attempt to build up network linkages when their sights are set purely on the mature, high- income markets.

Ⅳ. Empirical Results

The dataset of the survey conducted by the Department of Statistics, Ministry of Economic Affairs in 2001 comprised of 2,170 Taiwanese firms in the manufacturing sector engaging in outward FDI under government approval. After subtracting four sample firms that report no proceeds within the year, a total of 2,166 observations were used in our empirical work. Among them, 730 out of total 2,166 observations choose to set up overseas subsidiaries in IE sector, and only 183 (about 25 per cent) of those IE multinationals are found in high- income countries.[11] Based on these samples, the present study applies the LIMDEP computer program with a full information maximum likelihood (FIML) estimation method to estimate our empirical model; the empirical results are presented in Table 3.

[11] Please check Appendix Table 2, the joint frequency table of our empirical model for details.

TABLE 3 – BIVARIATE PROBIT ESTIMATES OF TAIWANESE OUTWARD FDI FIRMS (2001)

Choices		Location		Industry	
Dependent variables		HIC		IE	
Determinants					
1.	DIE	0.713***	(9.931)	1.938***	(28.116)
	L/K	-0.733***	(-10.172)	0.192***	(2.741)
2.	RD	0.285***	(2.804)	0.237**	(2.457)
	OTEC	0.324***	(4.058)	0.027	(0.315)
	ASSET	0.003**	(2.533)	-0.001	(-0.340)
3.	MARKET	0.194**	(2.562)	0.120*	(1.699)
	TARIFF	0.205	(1.025)	-0.154	(-0.617)
4.	MAT	-0.562***	(-5.929)	0.240***	(2.892)
	Constant	-1.276***	(-11.547)	-1.809***	(-16.206)
Log-likelihood function		-1719.328			
Sample size		2166			

Note: [a] Figures in parentheses are t- values.

[b] *, ** and *** indicate significance at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

Most explanatory variables behave in accordance with the hypotheses. First of all, as the table shows, the results for 'Location choice' reveal that the behavior of Taiwanese firms resident in different industry groups (that is, IE and non-IE industries) lead to different FDI location decisions. More specifically, in Taiwan, firms preferring to invest overseas in high-income countries are probably those from IE sector. Conversely, original non-IE firms would probably find it easier to locate their overseas subsidiaries in low-middle income countries. As for the 'Industrial' decision, the results show that firms that coming from IE sector domestically tend to invest in the same sector abroad.

Although some previous empirical studies have addressed similar issues using different datasets and model to Taiwan, we can find no paradox between their works and ours. For example, in contrast to our Bivariate decision model, for the purpose of controlling possible industry bias,[12] Makino *et al.* (2002) singled out electronic equipment industry, and found the corresponding investors also had higher probability invested in developed countries.

Furthermore, our empirical results show that when the overseas operation depending mainly on labor input, the probability of the firm's foreign base being in a high- income country is lower. On the other hand, it is interesting to note that those who choose to shift out to be in the IE industry, are exactly those whose overseas operations consume a lot of labor. This finding might indicate that for IE multinationals from Taiwan, a majority of operations that shift abroad is lower- end, labor- intensive operation.

The hypotheses concerning firm- specific, strategic motives of FDI are confirmed in our empirical work. Both R&D activities and large- scale asset holding demonstrate a firm's determination to invest in a mature economy. For firms with build-in R&D department, they tend to conduct outward FDI that aim at IE sector.

We also find that in accordance with conventional theory, when investors revealing expansionary, market- oriented motives when conducting FDI, they tend to appear in a high-income country. Both Kuo and Li's studies about FDI of Taiwanese SMEs (2003) and the

[12] In their trimmed data set, 113 out of total 328 samples are from the electronic equipment industry (Makino *et al.*, 2002: 415).

works of Makino *et al.* (2002) on Taiwanese FDI all disclosed similar results. In a similar token, and with a lower significant level, many IE multinationals from Taiwan are invest abroad with a market- driven motive. There are, however, still some unsolved mysteries in our empirical results. There is, for example, no significant evidence coming out of this study to support the argument that the concern of tariff will affect the FDI decisions.

Finally, our results show that for those businesses engaging in FDI, the lower their involvement with network relationships, the higher the probability of their overseas investment taking place in a high- income country. Conversely, multinationals that make a point to strategically form network relationship tend to invest in IE sector. Our findings also echoes that of Chen and Chen (1998), who emphasize that networking is a common activities found in multinationals from Taiwan that choose China and Southeast Asia as destinations. Furthermore, Chen and Chen (1998) and Chen (2003) also accentuate in their studies about Taiwanese multinationals, the importance of strategic linkages in the high- technological, and electronics industries.

Ⅴ. Conclusions

At the start of 2002, after numerous unsuccessful attempts, Taiwan finally succeeded in gaining accession into the World Trade Organization, signifying the beginning of a new era. As a result, Taiwan has set out to participate even more vigorously in the rapidly growing and integrated global economy. This study focuses on one aspect of the globalization process, that is, Taiwanese firms' participation in outward capital investment.

We have examined empirically hypotheses about the locational choice of FDI with data collected in 2001. Our findings suggest that a firm originated from information and electronics industries, characterized by its involvement in R&D-related activities, and which has a market-driven orientation, a lower level of labor input, and a lower investment in networking, would prefer to penetrate a high-income country. As for the industrial choice of FDI, this study shows that a firm operates domestically in information and electronics industries, holds a R&D sector, emphasizes labor inputs and network involvement will tend to invest overseas in information and electronics industries.

As compared to many of the previous works, some distinct advantages arise from the dataset applied in this research; as a result, the empirical data gleaned from this study may indeed provide some new insights. First of all, our study set up a bivariate Probit regression model, this allow us discuss multinationals' locational and industrial decision jointly. Secondly, the sample size provided by the government authorities is considerably larger than those of the previous studies. Finally, our sample set has less inherent bias than many of the earlier works because it covers firms' investment targets are globally spread.

There are still many unanswered questions. For example, why those who consume more labor inputs target on information and electronics industries as their main overseas operations? Would the results be any different if we further break down the industrial or countries (locations) classifications? Is there any certain kind of decision sequence involved when making FDI-

related choices? More work is needed if we are to further our understanding of the driving forces behind the move towards Taiwanese FDI.

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APPENDIX TABLE 1 – BASIC STATISTICS AND CORRELATION COEFFICIENT MATRIX

	Mean	Std. Dev.	HIC	IE	L/K	RD	OTEC	MARKET	TARIFF	MATER	DIE	ASSET
HIC	0.178	0.382	1.000									
IE	0.337	0.473	0.136***	1.000								
L/K	0.575	0.494	-0.267***	0.038**	1.000							
RD	0.813	0.390	0.112***	0.140***	-0.049***	1.000						
OTEC	0.229	0.421	0.074***	-0.031	-0.024	-0.022	1.000					
MARKET	0.636	0.481	0.081***	0.030	-0.075***	0.094***	0.027	1.000				
TARIFF	0.029	0.168	0.027	-0.042**	-0.035*	0.034*	-0.010	0.045**	1.000			
MAT	0.240	0.427	-0.156***	0.103***	0.185***	-0.008	0.033*	-0.038**	-0.033*	1.000		
DIE	0.397	0.489	0.227***	0.655***	-0.027	0.162***	-0.059***	0.004	-0.051***	0.066***	1.000	
ASSET	4.778	30.131	0.090***	0.015	-0.025	0.066***	0.021	0.056**	0.015	-0.040*	0.030	1.000

Original data Sources: Survey on Taiwanese Manufacturing FDI, Ministry of Economic Affairs, 2002.

Note: a. *, ** and *** indicate linear correlation between variables significance at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

b. Number of observations: 2166.

APPENDIX TABLE 2 – JOINT FREQUENCY TABLE

IE \ *HIC*	1	0	Total
1	183	547	730
0	202	1234	1436
Total	385	1781	2166