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Behavior of Japanese, Western, and Asian MNCs in Thailand: Lessons for Japanese MNCs

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Abstract

The paper examines the business strategy and behavior of multinational corporations (MNCs) from Japan, Asia, the US and Europe with a focus on Thailand, and with an emphasis on their relationship with local economies (firms) by using mainly the results from the questionnaire survey and interviews. The paper found that while differences do exist between MNCs of different nationalities in Thailand, the differences are often not highly significant. It is likely that more significant differences do exist between MNCs and local Thai firms. The results from the analysis indicate the need for Japanese MNCs to develop and expand the relationships with local economies in the areas of procurement, staff recruitment, technology activities, R&D and innovation, and information collection, in order to improve their business performance.

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I Introduction and Context

The purpose of the paper is to examine the business strategy of multinational corporations (MNCs) from Japan, Asia, the US and Europe with a focus on Thailand, and with an emphasis on their relationship with local economies (firms) and to identify the strategies that would improve Japanese MNC performance.

While the provision of suggestions for Japanese MNCs is one of the objectives of the paper, the goal of our paper is also to conduct academically sound, high-quality, and objective analysis. We aim to evaluate the performance (profitability) of Japanese MNCs by making a comparison with Asian, US and European MNCs, and identify the various factors that result in differences in performance, such as: procurement and sales practices, labor relations, technology and R&D strategy (technology transfer and technology development strategies), and others.

A number of previous studies have primarily examined the relationships between foreign ownership and wage levels or productivity. In general, these studies have relied on secondary source databases such as the National Statistical Office surveys and industrial directories. A recent comprehensive study concludes[1]:

> *"….there was a weak tendency for MNCs from Europe, Japan, and the United States to have relatively high labor productivity and wages, for wholly-foreign MNCs to have relatively high labor productivity, and for majority- and wholly-foreign MNCs*

[1] The quote is taken from Ramstetter (2004). See also the other papers by Ramstetter and by Matsuoka cited in the references. An older reference looking at similar issues is Tran (1993).

to pay relatively high wages. However, these results suggest that the relationships among labor productivity or wages, on the one hand, and nationality or foreign ownership shares, on the other hand, were generally weak in Thai manufacturing. These results are also consistent with those of previous studies in suggesting that the relationship between labor productivity and foreign ownership in general was also rather weak, though the relationship between wages and foreign ownership was somewhat stronger."

In order to supplement the data coverage of the somewhat limited research on this area in Thailand, in particular in terms of details on the characteristics of the multinational firms in Thailand, the paper draws on two original datasets: (a) an extensive survey of firms in two major sectors – electronics and automotive[2] (see Appendix 1 for the questionnaire that was used); and (b) a smaller number of selected interviews with a number of Japanese and other MNCs in the two sectors. In addition to shedding additional light on the extent of differences between various groups of MNCs, the paper will use this new information to draw lessons for the managers of Japanese MNCs operating in Thailand.

II. Foreign Direct Investment in Electronics and Automotive Sectors in Thailand

II.1 Thailand: Attractive FDI Destination for Japanese Electronics and Automobile Firms

Thailand has traditionally been an important FDI destination for Japanese firms. Following a dramatic increase in Japanese FDI in Thailand in the latter half of the 1980s, resulting from the combination of the remarkable appreciation of the Japanese yen and the emergence of the bubble economy in Japan on the one hand, and FDI liberalization in Thailand on the other hand, Japanese FDI to Thailand declined sharply in the early part of the 1990s mainly due to the bursting of the bubble economy in Japan (Figure 1). However, this declining trend reversed in the mid-1990s and Japanese FDI started to rise again until 1997, when the currency crisis hit the Thai economy. After another dramatic decline immediately following the crisis, Japanese FDI in Thailand fluctuated before starting to rise again in 2003. Thailand's success at attracting Japanese FDI is reflected by the fact that the country's share of Japanese FDI stock in Asia stood at 11 percent at the end of 2004[3].

In addition, Thailand has been a very attractive country for Japanese manufacturing firms. Indeed, a survey conducted by Japan Bank for International Cooperation (JBIC) on

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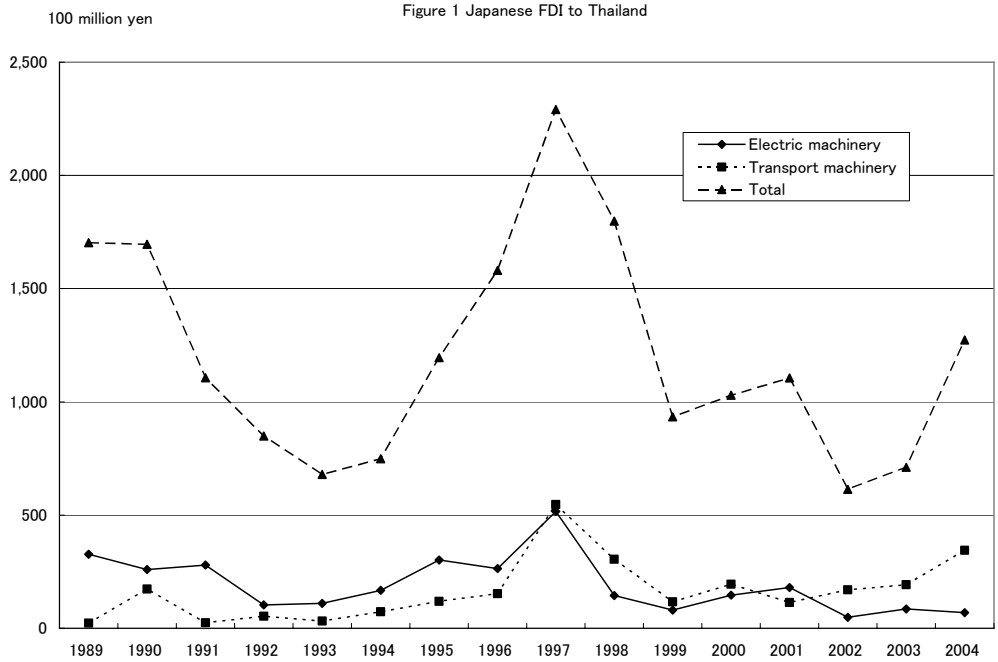
[2] The selection of these two sectors was made based on a number of factors: (a) the existence of a variety of nationalities and a significant Japanese interest; (b) the existence of reasonably good sample frames from which to draw samples; and (c) the existence of a number of related interesting stories in these two sectors.

[3] Since a large part of Japanese FDI has been invested in developed countries, the share of Thailand in Japanese overall FDI amounted to only 2 percent at the end of 2004.

Figure 1 Japanese FDI to Thailand



Japanese manufacturing firms found that Thailand has been one of five most attractive countries for Japanese manufacturing for many years[4] In the latest survey conducted in 2005 Thailand was ranked third, with 31 percent of the respondents ranking Thailand among the top five most attractive FDI destinations. Some favorable elements of Thailand as an investment site include low-wage labor, good market potential, and political and social stability[5].

Japanese FDI in Thailand in the electrical, electronics and transportation industries has been relatively stable when compared to overall FDI from the early 1990s to the early 2000s[6]. Annual Japanese FDI in the electrical and electronics industry was greater than that in transportation industry until 1997, but the trend was reversed after 1997. The recent increase in Japanese FDI in the transportation machinery industry in Thailand appears related to the "apparent" successful development of the automotive industry in Thailand. Overall, while it is true that MNCs contributed significantly to the successful development of both the automotive industry and the electronics industry in Thailand, the Thai government applied very different policies to develop these two industries. Trade and FDI liberalization policies were applied to the electronics industry in the context of overall liberalization of FDI, but closed or protectionist policies were generally applied toward the automotive sector[7]. The

4 The annual survey receives around 500 responses from Japanese manufacturing firms owning overseas affiliates. The results of the survey are published in the journal published by JBIC (Journal of JBIC Institute).

5 JBIC(2006). Note that this survey was conducted in July-September 2005, and therefore, the recent political turmoil in Thailand is not reflected in the response.

6 The transportation industry includes not only automotives but also motorcycle and other transportation machinery sectors.

7 FDI policies of Thai Government are discussed in Section II.3.

contrasting policies led to different business strategies pursued by Japanese MNCs, which will be discussed in a later section.

A comparison of Japanese MNCs' operation in Thailand and that in other countries revealed notable differences as shown in Table 1. The figures show that Thailand is a particularly important overseas location in Asia for Japanese transportation machinery MNCs, but for the electric MNCs, Malaysia is a more important location. Having noted the relative unimportance of Thailand for Japanese electric MNCs in Asia, it should be emphasized that East Asia as a whole has been a very important production and export base for many Japanese electric MNCs. As such, one cannot underestimate the importance of Thailand as an FDI host for Japanese electric MNCs.

A breakdown of the starting year of operation by the period reveals that a large number of Japanese electric MNCs began their operation in Thailand and Malaysia before the 1990s, earlier than those in other countries. Relatively speaking, Japanese MNCs operation in transportation machinery industry began more recently for many countries including Thailand. These differences in timing of starting operation in electric and transportation machinery industries coincide with the sequences that are typically observed in industrial development, that is, the development of electric industry comes before the development of transportation machinery industry, reflecting the differences in the level of technology required for the development of these industries.

Differences in FDI policies applied for the two industries are clearly reflected in the equity participation patterns shown in Table 1. For the electric industry a large share of Japanese MNCs hold wholly owned affiliates as FDI policies for that sector have been liberalized. However, equity participation is limited for the affiliates in the transportation machinery industry not only in Thailand but also in other Asian countries, because the

Table 1: Characteristics of Asian Affiliates of Japanese Firms: 2001

	Electronics					Transport Equipment				
	Thailand	Malaysia	Indonesia	Philippines	China	Thailand	Malaysia	Indonesia	Philippines	China
Number of Establishments	59	107	42	39	219	128	39	64	36	113
Employment	52,014	98,616	51,332	49,186	210,323	63,228	22,119	48,711	27,218	63,755
Year of Establishment (%)										
-1989	45.8	57.9	9.5	25.6	17.4	35.2	51.3	37.5	30.6	5.3
1990－92	13.6	24.3	14.3	7.7	11.0	6.3	10.3	12.5	19.4	10.6
1993-95	16.9	11.2	40.5	30.8	46.6	21.1	17.9	14.1	22.2	47.8
1996-98	20.3	6.5	33.3	12.8	11.4	25.0	10.3	25.0	25.0	21.2
99-	3.4	0.0	2.4	23.1	13.7	12.5	10.3	10.9	2.8	15.0
Total	100	100	100	100	100	100	100	100	100	100.0
Equity Participation by Japanese Firms (%)										
<25%	1.7	2.8	0.0	0.0	1.8	3.9	20.5	1.6	0.0	6.2
25%< x <50%	10.2	6.5	4.8	5.1	7.8	29.7	48.7	17.2	13.9	24.8
50%	0.0	0.9	0.0	0.0	5.9	3.1	2.6	9.4	0.0	20.4
50%< x <75%	15.3	12.1	21.4	5.1	20.1	24.2	10.3	29.7	13.9	16.8
75%< x <100%	22.0	7.5	21.4	7.7	13.2	26.6	5.1	23.4	25.0	9.7
100%	50.8	70.1	52.4	82.1	51.1	12.5	12.8	18.8	47.2	22.1
Total	100	100	100	100	100	100	100	100	100	100

Source: Kaigai Jigyo Katsudo Kihon Chosa [Comprehensive Survey of Overseas Activities of Japanese Firms], no. 32, 2002

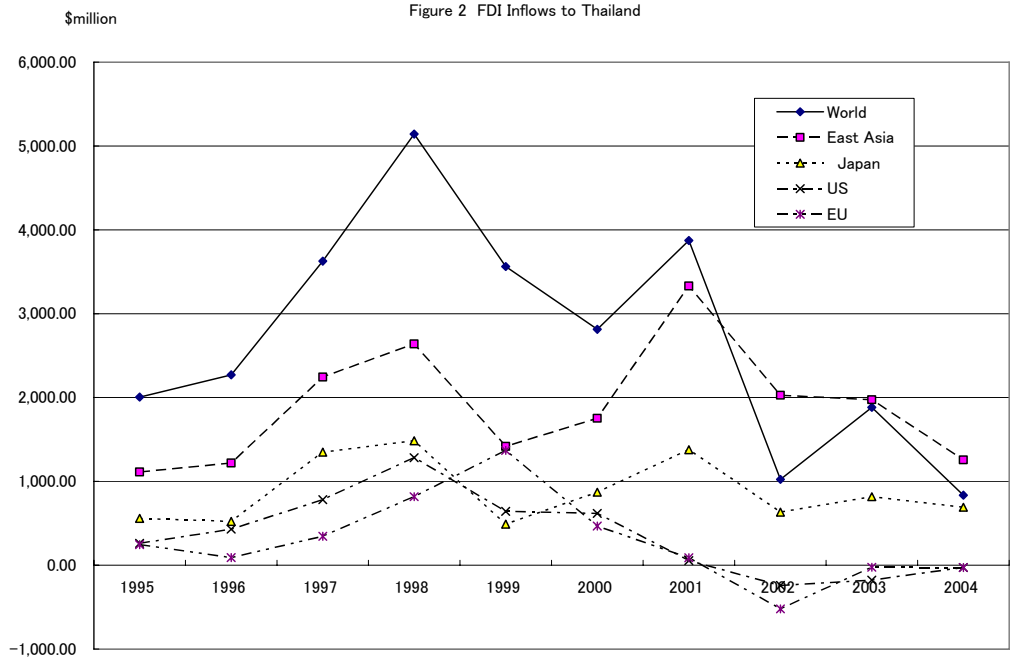
governments impose restrictions on foreign ownership, as they are eager to develop national industries.

II.2 Foreign Direct Investment in Thailand[8]

Foreign direct investment inflows to Thailand increased notably in the 1990s until 1998, since then they continued to decline with some fluctuations. Despite large changes in the FDI inflows from the world, FDI inflows from Japan remained relatively stable from the mid-1990s to the mid-2000s (Figure 2). Relative stability in FDI inflows from Japan can be observed by noting that FDI inflows from the US and the EU continuously declined since the 1997 financial crisis. Indeed, FDI inflows from these regions recorded negative values from 2002 to 2004, indicating that FDI withdrawal was larger than FDI inflows.

Sectoral distribution of FDI inflows to Thailand experienced substantial fluctuations from 1995 to 2004 (Table 2). For the cumulative FDI inflows for the 10-year period from 1995 to 2004, the shares of manufacturing and non-manufacturing are more or less balanced with somewhat higher share captured by non-manufacturing. Among the manufacturing sub-sectors general and transportation machinery had the highest share at 13 percent of total, which is followed by electric and electronic machinery at 9 percent. These observations indicate that the two sectors we chose for our analysis are top two sectors in terms of FDI inflow values[9]. It is to be noted that FDI inflows in electric and electronic industry were negative from 2002 to 2004, the most recent year for which the data are available. Negative

Figure 2 FDI Inflows to Thailand



8 See Brimble (2006) for more details.

9 General machinery and transportation machinery cannot be separated in the publicly available data.

Table 2: Sectoral Composition of FDI Inflows to Thailand ($ million, %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	1995-2004	Share
Total	2,004	2,271	3,627	5,142	3,562	2,813	3,783	1,023	1,882	835	26,942	100
Manufacturing	567	709	1,818	2,206	1,269	1,811	2,225	511	517	516	12,149	45.1
Food	39	45	226	73	94	93	105	-72	99	184	886	3.3
Textiles	38	49	41	124	21	28	56	24	37	0	418	1.6
Metal products	92	113	216	342	262	95	352	91	34	189	1,786	6.6
Electric and electronic machinery	234	241	602	264	425	297	662	-77	-108	-111	2,429	9.0
General and transport machinery	145	109	396	661	393	666	435	220	129	347	3,501	13.0
Chemicals	94	183	164	226	8	382	56	81	59	-3	1,250	4.6
Petro products	-162	-250	10	329	9	30	280	33	5	-357	-73	-0.3
Construction materials	25	3	112	842	247	133	-208	-291	-247	-238	378	1.4
Other manufacturing	62	216	173	164	20	162	282	189	298	258	1,824	6.8
Non-manufacturing	1,437	1,562	1,809	2,936	2,293	1,002	1,558	512	1,365	319	14,793	54.9

Note: BOP basis.
Source: Board of Investment, Thailand

FDI inflows indicate withdrawal of FDI, possibly reflecting the relocation MNCs' production base from Thailand to other East Asian countries such as China.

II.3 FDI Policies in Thailand

Before proceeding to a consideration of the detailed study of the characteristics of multinationals in the automotive and electronics sectors in Thailand, we shall provide a brief overview of the evolving FDI policy environment in Thailand[11].

Foreign direct investment (FDI) policies in Thailand date back more than three decades, to a time when there was very little industry, primarily simple assembly activities, and the domestic marketplace was relatively small. Although the Board of Investment (BOI) is the agency responsible for attracting FDI, other government agencies play a role in influencing the investment environment at a given point in time. The general thrusts of BOI policies evolved from import substitution in the early 1960s to the promotion of manufactured exports in the early 1970s to late 1980s, and then to industrial decentralization in the early 1990s.

Investment promotion policy remained relatively unchanged from 1993 until the 1997 financial crisis. To restore lost investor confidence, the government then worked hard to increase revenues, reduce spending, strengthen the country's legal and regulatory framework, and reduce foreign currency losses. In 1997 and 1998, the BOI adopted a number of short-term measures to stimulate investment and exports of Thai-manufactured goods, including the relaxation of zoning requirements for export projects, permitting duty-free imports of replacement machinery used by exporters, and allowing projects to increase their production capacities more easily in order to encourage them to achieve economies of scale and find new markets. Existing joint venture projects were permitted, with the Thai partners' consent, to raise capital to ease financial difficulties and become majority or 100% foreign owned companies. Many Japanese firms took advantage of this relaxation.

[11] Drawn largely from Brimble (2006).

In August 2000, the BOI introduced a new incentive package which continued to emphasize industrial decentralization. The new policies allowed foreign investors to own a majority or all shares in manufacturing projects, lifted local content and export requirements to comply with WTO rules, and required ISO 9000 certificates to be obtained within 2 years of start-up for projects with investment capital over 10 million baht (excluding cost of land and working capital) to promote efficiency and competitiveness.

Under the current government, the BOI introduced in 2003-2004 a number of new measures with an emphasis on enhancing competitiveness of Thai industries. First, the BOI has relaxed location conditions attached to the list of activities eligible for investment promotion in order to encourage cluster development. Second, the BOI has identified the need for customized incentive packages to create a more suitable balance between investor needs and their economic contribution to the country. In this regard five priority target industries have been identified for "aggressive promotion": (1) Agro-industry. (2) Fashion. (3) Automotive assembly. (4) Information Communication Technology (ICT) including Electronics. (5) High value-added services.

It would be true to say that the past year has seen, for the first time, a systematic attempt at investor targeting, both at the sector and at the firm level. At the sector level, previous efforts had focused only on the production of sector-specific investment promotion materials and sector workshops in the investing countries. Now, prompted by the focus of the government on the five sectors, the BOI is moving much more aggressively to develop customized packages for the targeted sectors. It is too early to judge the effectiveness of these new approaches[12], but they do reflect global tendencies in best-practice investment promotion agencies.

Lastly, on the technology front, the BOI has recognized that skill development, technology transfer and innovation (STI) are critical to Thailand's industrial competitiveness. In early 2004, the BOI adopted a series of measures to promote investment in these areas, as follows:

1) The BOI offers additional tax incentives to activities with STI elements that need to innovate in order to remain competitive in global markets. The STI criteria include:
    - R&D or design expenditures of not less than 1-2 percent of annual total sales in the first 3 years;
    - Recruitment of not less than 1-5 percent of total workforce within the first 3 years

[12] However, it is interesting to note that one of the new sectors targeted for special treatment has been the hard disk drive industry, following years of relative passive government attention for the industry. And in the second quarter of 2004, following the introduction of a new incentive package, the three major producers in Thailand – Seagate Technology, Hitachi Global Storage Technologies, and Western Digital – announced expansion projects totaling more than US$ 600 million (Bangkok Post, 2004). While the causality is not solid, company interviews indicate that the industry appreciates the recent attention given to it by the government, not to mention more generous tax incentives.

of S&T personnel with a minimum of a bachelor's degree in science, engineering or other technology, R&D, or design-related fields;

- Training expenditures for staff of not less than 1 percent of total payroll within the first 3 years; and
- Cost of programs to develop vendors or to support related educational institutes of not less than 1 percent of annual total sales within the first 3 years.

Projects that meet each of these criteria will receive one additional year's corporate income tax holiday, with the total corporate income tax holiday not to exceed eight years. In addition, machinery imported for use in these projects will be exempt from import duty.

2) Projects in eight activities that directly support the development of STI in Thailand are treated as priority activities and receive maximum incentives regardless of location. Benefits for these projects will not be subject to the cap on incentives, and imports of machinery will be duty-free:
   - Manufacture of medical supplies or medical equipment;
   - Manufacture of scientific instruments;
   - Electronic design;
   - Research and development (R&D);
   - Scientific laboratories;
   - Calibration services;
   - Human resources development (HRD); and
   - Manufacture and repair of aircraft.

III. Electronic and Automotive Multinational Corporations in Thailand: The Results of Questionnaire Survey[13]

We examined foreign direct investment in Thailand with a focus on Japanese FDI and FDI in electronic and automotive sectors in section II. Our examination provided a broad picture of MNCs' activities in Thailand. This section undertakes an in-depth analysis of MNC activities in the electronics and automotive industries in Thailand. For the analysis, we conducted a questionnaire survey of MNCs and interviews with senior staff of MNCs. This section analyzes the results of the questionnaire survey. The analysis is complemented with insights gathered from interviews with a smaller sample of firms[14], carried out both for this project and other related projects.

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13 See Brooker Group (2001) for a discussion of the key issues facing these two sectors.

14 Nine firms were interviewed, with an interview guide covering: procurement of raw materials and machinery; sources of financing; technology transfer; R&D; relations with government and business and universities.

III.1 Basic Statistics for the Surveyed MNCs

A questionnaire survey was conducted by sending questionnaire forms. We received responses from 155 and 82 MNCs in the automobile and electronics sectors, respectively. The basic information on these MNCs is given in Table 3.

Japanese MNCs dominate in the number in both industries. The detailed breakdown of the nationality of MNCs included in Asian and Western countries is provided in Appendix Table 1. For Asian MNCs, Taiwanese MNCs have a large share while for Western MNCs, US MNCs account for a large share.

Many MNCs in Thailand were established in the 1980s and 90s, when Thailand began to attract a large number of FDI. However, some MNCs from the US and European countries set up their affiliates before the 1980s. The patterns of equity participation show interesting differences among the MNCs from different regions. Western MNCs have higher

Table 3: Basic Information on the Sample Data

	Automotive						Electronics					
	# of affiliates			Percentage share (%)			# of affiliates			Percentage share (%)		
	Japan	Asia	Western	Japan	Asia	Western	Japan	Asia	Western	Japan	Asia	Western
Total	129	13	15	100	100	100	55	26	8	100	100	100
Year of establishment												
-1979	13	0	5	10.1	0.0	33.3	3	0	0	5.5	0.0	0.0
1980-89	23	3	1	17.8	23.1	6.7	21	8	2	38.2	30.8	25.0
1990-99	77	9	6	59.7	69.2	40.0	26	16	6	47.3	61.5	75.0
2000-	16	1	1	12.4	7.7	6.7	5	2	0	9.1	7.7	0.0
Equity share												
-24	1	0	0	0.8	0.0	0.0	1	1	0	1.8	3.8	0.0
25-49	27	1	1	20.9	7.7	6.7	5	3	0	9.1	11.5	0.0
50-74	27	6	4	20.9	46.2	26.7	4	2	1	7.3	7.7	12.5
75-99	34	3	2	26.4	23.1	13.3	10	3	0	18.2	11.5	0.0
100	40	3	8	31.0	23.1	53.3	35	17	7	63.6	65.4	87.5
Employment												
-49	6	3	1	4.7	23.1	6.7	2	2	0	3.6	7.7	0.0
50-99	4		0	3.1	0.0	0.0	4	3	0	7.3	11.5	0.0
100-199	23	0	6	17.8	0.0	40.0	6	8	1	10.9	30.8	12.5
200-299	15	2	0	11.6	15.4	0.0	9	4	3	16.4	15.4	37.5
300-499	34	2	4	26.4	15.4	26.7	6	3	1	10.9	11.5	12.5
500-999	28	5	4	21.7	38.5	26.7	10	3	0	18.2	11.5	0.0
1000-	18	1	0	14.0	7.7	0.0	18	3	3	32.7	11.5	37.5
Profitability												
x<0	3	2	2	2.3	15.4	13.3	8	5	2	14.5	19.2	25.0
0≦x<2.5	18	3	2	14.0	23.1	13.3	18	8	1	32.7	30.8	12.5
2.5≦x<.5	16	2	2	12.4	15.4	13.3	10	2	1	18.2	7.7	12.5
5≦x<7.5	19	1	2	14.7	7.7	13.3	3	3	0	5.5	11.5	0.0
7.5≦x<10	21	0	5	16.3	0.0	33.3	5	0	0	9.1	0.0	0.0
10≦x<12.5	16	1	1	12.4	7.7	6.7	3	2	0	5.5	7.7	0.0
12.5≦x<15	10	1	0	7.8	7.7	0.0	2	2	1	3.6	7.7	12.5
15≦x<17.5	10	3	0	7.8	23.1	0.0	0	0	2	0.0	0.0	25.0
17.5≦x<20	6	0	0	4.7	0.0	0.0	0	0	0	0.0	0.0	0.0
20≦x5	7	0	1	5.4	0.0	6.7	5	4	1	9.1	15.4	12.5

equity shares than those from Japan or Asia. Between MNCs in automotive and electronics, the equity share is higher for electronics, regardless of their nationality. These sectoral differences in equity participation ratios reflect the differences in FDI policies in two sectors, in that strict regulation on equity ownership was imposed on the automobile sector, as the Thai government was keen on developing its own automobile industry by limiting foreign influence. The size distribution of employment by the affiliates show similar patterns among Japanese, Asian, and Western MNCs, and it is also similar between automobile and electronics sectors. One may point out relatively large number of very small affiliates with less than 49 workers for the affiliates of Asian MNCs. Turning to profitability, one finds wide variations regardless of the nationality of MNCs in both industries. Indeed, one could detect a bimodal distribution in several cases such as automotive and electronics for Asian MNCs and electronics for Western MNCs.

III.2. Staffing

1. CEO, Managers and Engineers

Japanese firms exhibit both similarities and differences regarding staffing when compared to Asian and Western counterparts (see Table 4). To begin with the similarities: the firms from the three regions generally place foreigners, especially those from the parent companies, to be CEO. Around 80 to 90 percent of the firms have foreign CEOs, with more than 50 percent of the firms having CEOs from their parent companies. We observe different staffing patterns for other job classifications. Compared to Western firms, Japanese firms show a greater tendency to assign foreign personnel to senior management positions, while they tend to hire a greater portion of local engineers in the total number of engineers. While staffing practices of middle managers by Japanese firms is similar to those by Western firms, they are different from those of Asian firms. Specifically Japanese and Western firms tend to have a higher proportion of local middle managers than Asian firms.

2. Task Managers

In order to examine how foreign firms treat or promote local workers in their operation, we asked if responsibility is given to local or foreign workers in various tasks. Responses to some of these questions may be interpreted to measure the extent of technology transfer achieved at the foreign firms. At the initial stage of operation, foreign workers, particularly those from parent firms, are likely to be given responsibility in various tasks, largely because of the unfamiliarity of the operation by local workers. Gradually, local workers are given responsibility as they acquire skills through experience and training.

The results of our questionnaire survey show several interesting patterns between industries, among different tasks and among firms with different nationalities. Between the electronics and automotive sectors, foreign staff members are given responsibility in a larger

Table 4: Staffing by Japanese, Asian and Western MNCs in Thailand

	Automotive			Electronics		
	Japanese	Asian	Western	Japanese	Asian	Western
Number of respondents	129	13	15	55	26	8
Total number of employees	582.22	491.64	397.13	992.60	428.85	2818.2
Local CEO (% of total number of firms)	18.60	14.29	20.00	5.45	23.08 *	18.18
Foreign CEO (% of total number of firms)	84.50	78.57	80.00	98.18	76.92	90.91
Foreign CEO from parent company (% of total number of firms)	59.69	42.86	66.67	78.18	50.00 **	54.55
Total number of senior managers	5.95	4.07	5.33	10.38	4.31 **	9.09
Share of local senior managers (%)	33.27	39.12	65.52 *	32.19	37.34	33.04
Share of foreign senior managers (%)	66.73	60.88	34.48 *	67.81	62.66	66.96
Of which from parent company (%)	32.95	41.67	16.67	81.93	83.71	63.33
Total number of middle managers	16.26	8.36	16.40	14.98	6.19 *	29.70 *
Share of local middle managers (%)	80.16	58.02 *	80.00	77.85	83.33	83.14
Share of foreign middle managers (%)	19.84	41.98 *	20.00	22.15	16.67	16.86
Of which from parent company (%)	31.25	33.33	0.00	50.72	55.00	50.00
Total number of engineers	14.09	29.82	19.00	28.40	6.80 *	24.63
Share of local engeers (%)	95.83	98.18	74.11 *	92.34	69.10 **	83.13
Share of foreign engineers (%)	4.17	1.82	25.89 *	7.66	25.90	16.88
Of which from parent company (%)	42.86	50.00	0.00	75.00	57.50	33.33
Staff with responsibility in different tasks						
Overall management						
Local staff	35.66	28.57	26.67	61.82	53.85	45.45
Foreign staff	82.17	85.71	86.67	92.73	80.77	81.82
Marketing						
Local staff	78.29	71.43	73.33	58.18	84.62	63.64
Foreign staff	65.89	50.00	60.00	78.18	57.69	81.82
Input procurement management						
Local staff	74.42	71.43	86.67	87.27	84.62	72.73
Foreign staff	44.19	50.00	46.67	58.18	30.77	63.64
Financial management						
Local staff	82.95	78.57	93.33	81.82	88.46	90.91
Foreign staff	30.23	42.86	46.67	58.18	38.46	54.55
Labor management						
Local staff	96.12	92.86	100.00	98.18	88.46	100.00
Foreign staff	3.88	14.29	0.00	25.45	23.08	18.18
Production management						
Local staff	70.54	57.14	66.67	80.00	84.62	81.82
Foreign staff	54.26	64.29	46.67	69.09	42.31 *	63.64
Inventory management						
Local staff	85.27	78.57	93.33	94.55	84.62	90.91
Foreign staff	17.83	21.43	6.67	43.64	30.77	45.45
Development of product management						
Local staff	76.74	71.43	80.00	70.91	84.62	54.55
Foreign staff	35.66	35.71	13.33	65.45	46.15	63.64
Development of new products						
Local staff	65.12	64.29	66.67	54.55	84.62	54.55
Foreign staff	51.16	71.43	53.33	70.91	42.31 *	72.73
Technology design						
Local staff	72.09	64.29	53.33	60.00	76.92	54.55
Foreign staff	44.96	42.86	40.00	67.27	46.15 *	72.73
Development of tools						
Local staff	82.17	85.71	86.67	70.91	65.38	81.82
Foreign staff	13.95	21.43	6.67	67.27	38.46 *	45.45
Improvement of production technology						
Local staff	82.95	78.57	93.33	76.36	84.62	81.82
Foreign staff	20.16	35.71	6.67	74.55	38.46 **	54.55
Quality control						
Local staff	86.05	57.14 **	80.00	85.45	84.62	81.82
Foreign staff	37.98	50.00	26.67	70.91	38.46 **	81.82
Maintenance & repair of equipment &facilities						
Local staff	94.57	71.43 **	100.00	92.73	92.31	90.91
Foreign staff	5.43	35.71	0.00	50.91	23.08 *	36.36

Note: "*" and "**" indicate the statistical significance of the difference of the means for Asian and Western firms in comparison with Japanese firms.

proportion of firms in automobiles. This is attributable to relatively newer operation and more complicated systems adopted by automobile firms.

The tasks for which foreign staff is given responsibility include overall management, marketing, production management, development of new products, technology design (automotive) and quality control (automotive). These tasks generally require specialized skills that may require sufficient time and experiences to be acquired. It is worth noting that at very few firms foreign staff is given responsibility in labor relations, since dealing with labor issues requires good knowledge of social, historic, and idiosyncratic characteristics of the local labor conditions. These findings are consistent with those obtained by Urata, Matsuura, and Wei (2006) in their study of Japanese firm's operation not only in Asia but also in other regions. They also found that the length of operation has a positive impact on the assignment of local workers to responsible positions, and that the placement of local workers in responsible positions is affected by the quality level of workers in the host countries, in that the higher the quality level of local workers in a host country, the larger the number of Japanese firms that give responsible tasks to local workers.

Among the firms of different nationalities, Japanese and Western firms show similar patterns regarding the nationality of responsible staff in many tasks. However, Asian firms do exhibit different patterns for many tasks in that the proportion of the firms that give responsibility to foreign staff is lower compared to the cases for Japanese or Western firms. Specifically, in production management, development of new products, technology design, development of tools, improvement of production technology, quality control, and maintenance and repair of equipment and facilities, a smaller share of Asian firms give responsibility to foreign staff compared to either Japanese or Western firms. These patterns may reflect a lack of foreign staff, particularly those from parent firms at these firms, which in turn may be attributable to their early stage of overseas operation.

III.3 Training

Training is a basic means to improve workers' skills. As such the provision of training reflects the firm's attitude toward its workers as well as its operation. A firm with a strong interest in upgrading the quality and competitiveness of the firms and its workers is active in providing training to its workers. Training can be provided in various ways including on-the-job training, in-house seminars as well as outside seminars. Japanese firms are well known for their strong interest in on-the-job training, particularly in the form of group activities such as seminars. Below we examine if Japanese firms have different approaches to training compared to Asian and Western firms.

Practically all foreign firms provide various types of training, which include on-the-job training, training manuals, training/seminars in Thailand. Compared to those training methods, relatively fewer firms provide training/seminars in parent firms. This is

particularly notable for Asian firms in electronics industry, possibly because of the low level of technology and skills that are required at Asian firms, as they tend to specialize in relatively low skill operation compared to Japanese and Western firms.

III.4 Research and Development (R&D)

Research and development (R&D) activities play a very important role in determining firm's performance, R&D would lead to the development of new products, new technology, and new production method, which would give competitive advantage for the firm. Although this observation may be generally valid for a firm, the importance of R&D has not been given much attention to overseas affiliates of multinational corporations (MNCs). This is because, at many MNCs, R&D has been conducted at their parent office and not at their overseas affiliates. However, as the length of the operation of overseas affiliates get longer, and as the competition among MNCs and local firms gets severer, the need to undertake R&D at overseas affiliates became greater. In the light of this observation, it is interesting to compare R&D activities of Japanese firms with other firms.

The responses to the questions on R&D appear to show somewhat inconsistent picture (see Table 5). Namely, Japanese firms are not active in R&D activities but they have made some achievements in the form of generating patents. One possible interpretation of these inconsistent patterns may be that Japanese firms bring their patented technologies from their parent office to their affiliates in Thailand and then obtain patents for these technologies. High level of R&D activities for Asian firms may be attributable to the following factors. One is the reflection of somewhat different perception of R&D activities by them in that they may regard activities such as improving production process, which is conducted by many firms as a part of routine operation, as R&D. Another possible factor is ineffective R&D activities, which have not led to the acquisition of patents. High level of R&D for Western firms is due to one firm, which is very active in R&D, but other Western firms are not active at all.

Table 5: Training and Rearch and Development (R&D) by Japanese, Asian and Western MNCs in Thailand

	Automotive			Electronics		
	Japanese	Asian	Western	Japanese	Asian	Western
Number of respondents	129	13	15	55	26	8
Training						
Provides on-the-job training to staff	99.22	92.86	100.00	96.36	96.15	100.00
Provides training manuals (in-house)	99.22	100.00	93.33	94.55	96.15	100.00
Provides other training/seminars in Thailand	99.22	100.00	100.00	89.09	84.62	90.91
Provides training/seminars in parent company (home country)	79.07	42.86 **	93.33	81.82	65.38	63.64
Research and Development (R&D)						
R&D activities	15.50	42.86 *	26.67	14.55	34.62 *	45.45
R&D expenditure in latest year, in MB	0.82	0.00	0.00	0.06	0.27	3.49
Number of R&D personnel	0.88	2.50	3.47	3.53	1.69	47.27
Number of patents developed in Thailand	18.23	1.00	10.53	0.35	0.12	68.18
Royalty received from patents in MB	0.79	0.00	0.00	4.06	10.38	0.00

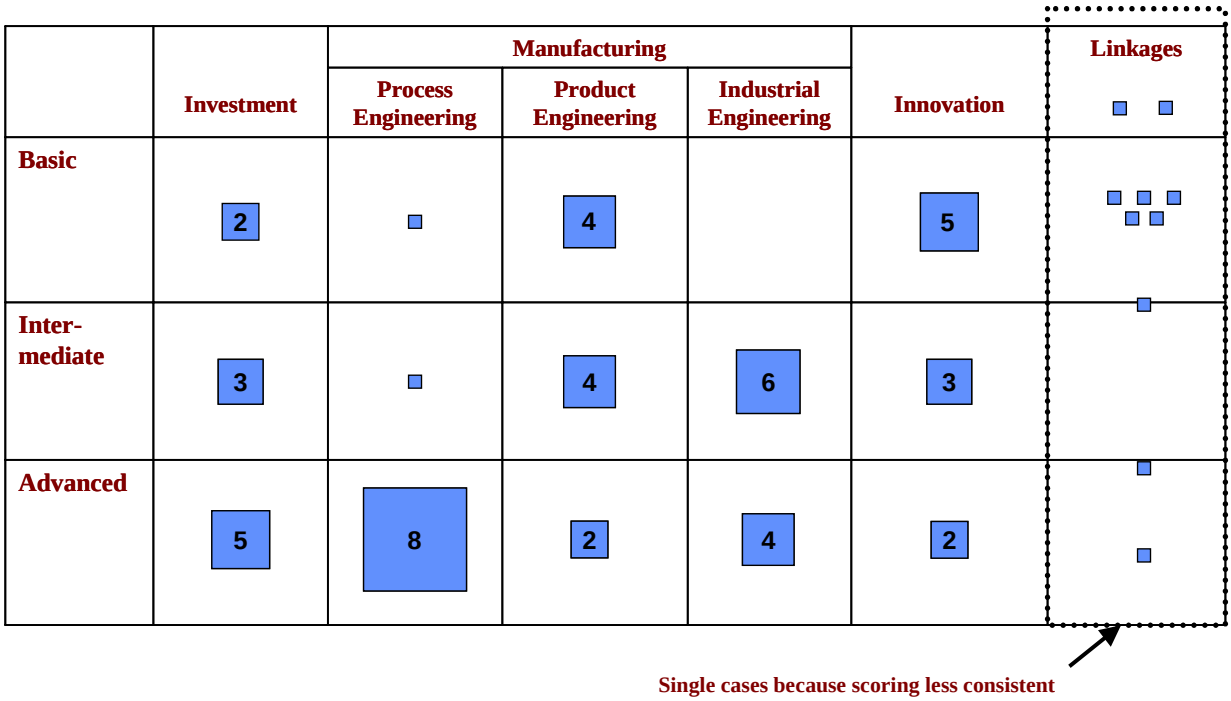
Note: "*" and "**" indicate the statistical significance of the difference of the means for Asian and Western firms in comparison with Japanese firms.

Technology Capabilities and Linkages in the HDD Cluster (box)

In a recent study, AIT/Asia Policy Research Consortium (2004) carried out a firm-level interview survey of the HDD industry (comprising almost completely MNCs). The survey used a conceptual framework with three levels of capability (basic, intermediate, and advanced) and four broad types of technology capability: (a) investment capability which measures the ability to plan and develop a new manufacturing operation; (b) management capability which measures the ability to carry out process or product engineering and also industrial engineering; (c) innovation capability which measures the capacity for R&D and innovation activities; and (d) linkages capability which measures the firms capacity for developing networks with organizations outside the firm.

Overall, as shown in Figure 3, the survey showed that: (a) the firms exhibited strong capabilities in investment, process development and industrial engineering areas, all areas that are required to directly support their manufacturing operations in Thailand; (b) the firms showed much weaker capabilities in product engineering and innovation, with indications that some firms (in fact non-Japanese firms) had gone much further in building these capabilities in their Thai operations than others; and (c) the firms showed very weak capabilities in linkage development, but indicated a strong interest in developing stronger linkages if the support infrastructure was in place, and that it would call for concerted efforts from both industry and the government to build an environment that is conducive to linkage development.

Figure 3: Technological Capabilities in the HDD Industry



Source: Firm-level Survey, AIT/Asia Policy Research Consortium (2004).

A closer examination of the linkages reported indicated that most companies are linked to a certain degree into the vertical supply chain of the Thai HDD cluster and share related information with regard to specific product related issues, especially for new products. But only a few firms, again mostly non-Japanese, co-operate closely with either Thai-based suppliers or customers in broader product, process, or human resource development related activities. And even fewer companies, (one Thai, one American) have horizontal linkages to universities, R&D institutions, service providers or competitors. It appears clear from the survey that it is now increasingly important for MNCs to devote greater attention to developing closer linkages with educational and technology institutions in Thailand to strengthen their ability both to manufacture quality products, but also increasingly to carry out within Thailand the technological activities required to innovate, especially in process-related activities.

Note on FDI and R&D in Thailand (box)

While the topic has not been studied much (see Patarapong and Peerapol (2005) for an exception), the following characterization of the strategies of MNCs towards R&D could be considered:

- Outsourced model – where the company seeks a university or perhaps a research institute/company to do the R&D, and builds a strong relationship with the partner. This will likely have strong spillover benefits and possibly lead to a synergistic relationship of great value. (the Seagate model).
- Internalized model. This is where a company with a significant manufacturing presence in Thailand puts in place an R&D center inside the company. While they may not develop many linkages with other institutions, this model at least creates some spillovers into the staff of the manufacturing operation. (the NMB model).
- Disconnected model. This is where a branch of the R&D activities of a major MNC is located in Thailand, but develops almost no linkages both with other institutions and also the manufacturing operations of the company in Thailand. (the Toyota model).

This is only a preliminary framework, and the data is very sparse, but in each case, there could be more or less linkages, depending on the company. But with the exception of Seagate, it is hard to find many other firms following the first model or even the other models but with more linkages.

III.5. Sales and Procurement

Sales and procurements patterns largely reflect the motives of operations or FDI by MNCs. An MNC interested in expanding sales in the host country market naturally sells a large proportion of its sales in the local market, while an MNC interested in using its

operation as an export platform exports a large part of its sales. As to the pattern of procurements of inputs, an MNC using its operation as an export platform tends to procure a large portion of its inputs from foreign countries, particularly from its home country. For such an MNC, the motive of undertaking FDI is to take advantage of low production and transportation costs, which in turn result from low wages and well-developed transportation services, respectively. Many FDI cases with an export motive are undertaken at export processing zones.

The results of our survey show different sales and procurements patterns between foreign firms' operation in automotive and electronics industries (Table 6). MNCs in electronics industries show strong export and import orientation, reflecting export-platform strategy. This pattern is particularly evident for Western firms, as their reliance on foreign countries outside of East Asia, is significantly greater, when compared to Japanese or Asian firms. An examination of the responses reveals that many European firms procure inputs from foreign countries outside of East Asia and sell their output in the US market. By contrast to these Western firms that utilize global procurement and sales networks, Japanese firms tend to use the networks centered around their parent firms in Japan, as the large shares of inputs as

Table 6: Sales and Procurement of Japanese, Asian and Western MNCs in Thailand

	Automotive				Electronics			
	Japanese	Asian		Western	Japanese	Asian		Western
Number of respondents	129	13		15	55	26		8
Sales								
Total company sales in MB	3827.63	1144.76		1183.49	5901.68	635.13		5815.60
Local sales in MB	10849.61	7661.47		733.47	15367.19	15386.99		44375.24
Share of local sales in total sales (%)	71.55	70.76		44.92 **	42.54	43.87		23.82
Local sales to foreign MNCs (%)	33.92	30.38		22.50	29.09	40.00		10.00
Local sales to MNCs from home country (%)	36.38	32.69		12.50 **	19.44	26.25		50.00
of which to affiliated subsidiaries (%)	2.58	0.83		0.00	30.00	0.00		66.67
Local sales to Thai companies (%)	29.69	36.92		65.00 **	53.58	33.75		40.00
Share of exports in total sales (%)	28.45	29.24		55.08 **	57.46	56.13		78.56
Exports to home country (%)	65.25	54.44		100.00	71.11	61.75		30.00
of which to parent company & affiliates (%)	21.25	2.22		50.00	50.91	25.00		100.00
Exports to East Asia except for those to home country (%)	24.75	27.78		0.00	24.08	23.25		30.00
of which to affiliated subsidiaries in East Asia (%)	9.17	30.26		0.00	44.36	41.50		50.00
Exports to 3rd country excluding East Asia (%)	10.00	17.78		0.00	4.82	15.00		40.00 **
of which toaffiliated subsidiaries in 3rd country excluding East Asia (%)	3.13	9.26		0.00	14.55	12.50		0.00
Net profits to sales ratio (%)	8.98	2.19	*	7.11	6.00	9.25		7.59
Procurement of parts and machine and equipment (M&E)								
Share of local procurement in total procurement (%)	60.08	53.21		47.74	39.89	39.18		37.19
Local procurement of inputs from MNCs (%)	28.37	33.50		37.50	9.00	38.00	**	3.50
Local procurement of inputs from MNCs from same home country (%)	34.78	29.50		30.00	29.15	32.00		12.50
of which from affiliated subsidiaries of parent company (%)	4.55	0.00		0.00	5.45	0.00		16.00
Local procurement of inputs from Thai companies (%)	36.85	37.00		32.50	61.85	30.00		84.00
Share of imports in total procurement (%)	39.92	46.79		52.26	60.11	60.82		62.81
Imports of inputs from home country (%)	83.96	69.00		63.33	88.95	70.00		14.29 **
of which from parent company & affiliates in home country (%)	21.46	10.00		0.00	55.95	48.75		0.00
Imports of inputs from East Asia except those from home country (%)	11.04	26.00		36.67 *	10.52	24.38		35.71
of which from affiliated subsidiaries in East Asia except those from home country (%)	7.29	34.10	*	33.33	27.32	47.50		0.00
Imports of inputs from 3rd country excluding East Asia (%)	5.00	5.00		0.00	0.53	5.63		50.00 **
of which from affiliated subsidiaries in 3rd country excl East Asia (%)	4.17	13.30		0.00	5.26	20.75		0.00
Share of local procurement of M&E in total procurement (%)	21.74	15.42		15.00	10.55	20.50		8.07
Local procurement of M&E from MNCs (%)	28.57	39.00		25.00	23.00	36.00		50.00
Local procurement of M&E from MNCs from same home country (%)	42.50	30.00		0.00 *	38.89	38.00		0.00
of which affiliated subsidiaries of parent company (%)	0.00	0.00		0.00	0.00	0.00		0.00
Local procurement of M&E from Thai companies (%)	28.93	31.00		75.00 *	38.11	26.00		50.00
Share of imports of M&E in total (%)	78.26	84.58		85.00	89.68	79.50		91.93
Imports of M&E from home country (%)	92.88	48.57	**	85.00	95.24	78.75		35.00 **
of which from parent company & affiliates in home country (%)	24.58	0.00		50.00	60.29	37.50		50.00
Imports of M&E from East Asia except those from home country (%)	6.69	51.43	**	15.00	2.65	21.25		47.50 **
of which from affiliated subsidiaries in East Asia except those from home country (%)	3.95	15.71		25.00	11.76	37.50		25.00
Imports of M&E from 3rd country excluding East Asia (%)	0.42	0.00		0.00	2.12	0.00		17.50
of which from affiliated subsidiaries in 3rd country excl East Asia (%)	0.00	0.00		0.00	11.76	0.00		25.00

Note: "*" and "**" indicate the statistical significance of the difference of the means for Asian and Western firms in comparison with Japanese firms.

well as sales involve trade with Japan. As expected, substantial share of transactions involve intra-firm transactions.

Sales and procurement patterns of MNCs in the automotive industry have greater reliance on local market when compared to those in the electronics industry. Strong local market orientation of MNCs in automotive is attributable to import protection policy applied to the automotive industry in Thailand, in order to develop the industry. Local market orientation is particularly strong for Japanese and Asian MNCs compared to Western MNCs. Reliance on intra-firm trade in sales and procurements is limited for MNCs in automotives than those in electronics. This may reflect the fact that the number of parts required for the production of automobiles is far larger than the case for electronics, thereby making it difficult to rely only on intra-firm transactions.

Turning to the procurement of machine and equipment (M&E) by MNCs, one observes low reliance on local market for both automotive and electronics. This is due to limited capability of machine and equipment production in Thailand. Accordingly, MNCs import them from foreign countries. The patterns of imports are different among MNCs. Japanese MNCs import M&Es mainly from Japan, while Asian and Western MNCs do not necessarily import them from their home countries. For Asian automotive MNCs and Western electronics MNCs, the main source of M&E imports is East Asian countries excluding home countries. Although identification of the main source country is not possible from the survey result, Japan is likely to be the source country, considering its competitiveness in M&E production.

A Note on Board of Investment Programs to Support Local Procurement[15] (box)

In addition to the standard investment incentives offered by the BOI, one BOI initiative that involved the automotive and electronics industries through focusing on backward linkages is the BOI Unit for Industrial Linkage Development (BUILD) Program, established in 1992 to encourage large companies to source local parts and components, as well as to help suppliers to improve quality, efficiency, and productivity. Under this program, the BOI surveys existing supporting industries in Thailand. It then analyzes parts and components needed by both Thai and foreign assemblers that are planning to start production in Thailand. Finally, it searches its database for domestic companies capable of meeting those needs and helps to establish transactions between these companies and assemblers.

The Vendors Meet Customers Program (VMC) was established by BUILD in November 1997 to stimulate domestic subcontracting of parts and components. BUILD, as a middleman, tries to match vendors/manufacturers with customers/assemblers. The program involves taking parts manufacturers to visit assembly plants every 3 weeks, and assists manufacturers to

[15] See AIT/Asia Policy Research Consortium (2004) for more details.

initiate business deals to supply parts and components for the plants. As a result, the parts manufacturers learn what the assemblers want, while the assemblers learn who can supply the parts they require.

BUILD has organized numerous supplier visits to major foreign investors in the automotive and electronics industries. On average, as many as 40-50 suppliers visited each company. One major impact of BUILD in the HDD industry can perhaps best be illustrated by the case of the newly established HGST (Hitachi Global Storage Technology) assembly plant that has hosted three BUILD supplier visits. The basic result is that HGST was able to identify a number of local suppliers of non-core materials and components and supporting services that they had not previously contacted. This resulted in some 100 million baht of local sourcing per year according to BUILD. While not negligible, longer established HDD firms such as Seagate with strong local knowledge found the program of less use as they had already exploited the supplier base to the maximum extent possible.

III.6. Performance

Various indicators can be used to measure the performance of the company. In this section we use sales-employment and net profit-sales ratios. Total factor productivity, return on asset, and other indicators may be more appropriate but lack of necessary information precluded us from using these indicators.

Table 7 shows that sales employment ratios (or sales per employee) are higher for Japanese MNCs than other MNCs in both automotive and electronics. In particular, the difference is statistically significant for the electronics industry. The sales-employment ratio has several shortcomings as an indicator for firm's performance. This is because the sales-employment ratio is influenced by the corporate structure of the industry and the composition of the sales of the company, which are somewhat related. A vertically-integrated company sells finished products, while companies in vertically disintegrated industrial or corporate structure sell both parts and finished products. As such, sales-employment ratio for a company under the vertically disintegrated industrial structure tends to show large value compared to a company under vertically integrated industrial structure. Recognizing one of the special characteristics of Japanese industrial structure is its extensive inter-firm linkages

Table 7: Performance of Japanese, Asian and Western MNCs in Thailand

	Automotive			Electronics		
	Japanese	Asian	Western	Japanese	Asian	Western
Number of respondents	129	13	15	55	26	8
Sales/Employment (MB)	4.63	3.02	3.54	4.01	2.21 **	2.04 **
Net profits to sales ratio (%)	8.98	2.19 *	7.11	6.00	9.25	7.59

Note: "*" and "**" indicate the statistical significance of the difference of the means for Asian and Western firms in comparison with Japanese firms.

under vertically disintegrated industrial system, one may attribute the high sales-labor ratios for Japanese MNCs to the differences in industrial structures.

To deal with these possible biases, we derive the net profit-sales ratios. The results show quite different patterns. For the automotive industry, Japanese MNCs perform better than Asian or Western MNCs, but this is not the case for the electronics industry. Asian MNCs' performance is significantly poorer compared to Japanese MNCs, in the automotive industry, while the differences in performance among MNCs from the three regions are not statistically significant in the electronics industry.

IV. The Determinants of Performance

We saw above some similarities and differences in behavior and performance among MNCs from different countries and regions. In order to identify their similarities and differences more precisely, we conduct regression analysis. In the analysis we identify the determinants of performance measured by profit-sales ratio by paying a special attention to the characteristics of Japanese MNCs.

In the analysis we chose the following explanatory variables, the length of operation (YEAR), the size of employment (EMPLOY), equity participation ratios by Japanese MNCs (JAPSHA), Asian MNCs (ASIASHA), Western MNCs (WESTSHA), local procurement ratio (LOCPROC), local sales ratio (LOCSALE), research and development (RDDUM), CEO sent by the parent company (CEOPAR), training seminar provided at parent company (SEMIPAR), and automotive industry dummy (AUTODUM). RDDUM, CEOPAR, SEMIPAR are dummy variables, which take unity if the affiliate in question has a positive response to the respective questions. We are interested in the impacts of nationality of the MNCs on MNCs performance by taking account of their strategies. In the analysis MNCs' strategies are captured by their geographical orientation, that is, inward or outward orientation and their interests in R&D. Geographical orientation is measured in three different ways, sales, procurement, and staffing.

The OLS estimation method was used for the regression analysis and the results are presented in Table 8. The results from the pooled data (automobile and electronics sectors) do not show statistically significant differences in profitability among Japanese, Asian and Western MNCs. MNCs with high local sales ratios (LOCSALE) are shown to register high profits, while MNCs with high local procurement ratios (LOCPROC) to record low profits. These findings are obtained for the results analyzing automotive and electronics industries as well. These results appear to indicate tough competition in the export market, while MNCs could save costs by procuring inputs from foreign countries. The estimated coefficients of these variables interacted with JAPSHA show very interesting results. LOCPRO*JAPSH is positive and statistically significant for automotives as well as for automotive-electronics combined datasets. This finding appear to indicate that Japanese MNCs have developed local

Table 8: The Determinants of Profitability of MNCs in Thailand

	Automotive and Electronics		Automotive		Electronics	
Variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
C	0.04937	0.07340	0.00803	-0.00933	0.17696	0.13909
YEAR	-0.00166	-0.00146	-0.00031	-0.00124	-0.00789 **	-0.00715 *
EMPLOY	0.00001	0.00001	0.00001	0.00002	0.00003	0.00003
JAPSHA	-0.00022	-0.00018	0.00000	0.00098	-0.00041	0.00013
ASIASHA	-0.00022	-0.00040	-0.00098 *	-0.00143 **	-0.00004	0.00005
WESTSHA	0.00018	0.00021	0.00015	0.00062	-0.00013	-0.00008
LOCPROC	-0.07098 **	-0.14972 **	-0.02437	-0.12571 **	-0.20191 **	-0.17715 *
LOCPROC*JAPSHA		0.00132 *		0.00191 **		-0.00058
LOCSALE	0.11912 **	0.15992 **	0.09327 **	0.24386 **	0.15399 **	0.16611 **
LOCSALE*JAPSHA		-0.00086		-0.00282 **		-0.00003
RDDUM	0.03187	0.07914 **	0.01961	0.06811 *	0.07186	0.10286
RDDUM*JAPSHA		-0.00090 *		-0.00092 *		-0.00086
CEOPAR	0.01397		0.01686		0.00957	
SEMIPAR	0.02149		0.02020		0.00186	
AUTODUM	-0.00582	-0.00378				
No of observations	209	209	140	140	69	69
R**2	0.10896	0.12866	0.13135	0.21143	0.26436	0.27566
Adj-R**2	0.05920	0.07531	0.06401	0.14366	0.13753	0.13587
F-statistic	2.18997 **	2.41166 ***	1.95061 **	3.11991 ***	2.08433 **	1.97201 **

Note: ***, **, * indicate statistical significant at 1, 5, and 10 percent, respectively

networks so that they could procure low-cost or high-quality inputs locally compared to other MNCs. By similar reasoning, statistically significant negative coefficient on LOCSALE*JASPH for automotives may indicate that Japanese MNCs have developed efficient distribution network in foreign countries, so that high exports would improve their profitability. These findings therefore seem to indicate the presence or possession of well-developed local procurement as well as overseas sales network by Japanese MNCs.

Research and development tend to have positive impacts on profitability in general but this is not the case for Japanese MNCs. Indeed, RDDUM*JAPSHA turns out to be negative and statistically significant for automotives. This appears to indicate that Japanese MNCs in Thailand has not been successful in research and development. For Japanese MNCs in Thailand, improving research and development activity is a very important challenge.

V. Conclusions: Lessons for Japanese MNCs to improve their performance in Thailand

In general, the statistical results tend to confirm previous results that, while differences do exist between multinational firms of different nationalities in Thailand, the differences are often not highly significant. It is likely that more significant differences do exist between multinational firms and local Thai firms.

However, our research and the statistical and qualitative findings do indicate a number of directions where the managers of Japanese multinationals operating in Thailand

and related business associations could improve their activities and strengthen their operations in Thailand.

The following areas have been identified:

- ***Procurement.*** While some larger Japanese firms have been quite successful in developing the local capacity in Thailand for procurement of parts and raw materials, medium sized firms and recently established firms tend to focus on manufacturing activities and not that much on local procurement. Japanese managers could work more closely with interested Thai government agencies, such as the BOI and the National Science and Technology Development Agency, to strengthen linkages with suppliers in general, and particularly with Thai SMEs.
- ***Staff Recruitment.*** The evidence indicates that Japanese firms tend to keep more Japanese staff in key positions than Western firms. Interview results indicate that senior local staff can often have beneficial effects on the operations of the Thai operations of multinationals and result in stronger linkages and interfaces with local training and technology institutions. Qualitative results from the HDD confirm this observation. Stronger networks with the high-quality business schools in Thailand as well as returning Thai graduates from foreign universities could be one way to strengthen the role of senior Thai managers.
- ***Technology Activities***. In the area of skilled employment, technology development, and R&D, Japanese firms could benefit from the development of stronger linkages with technology and educational institutions in Thailand. Existing initiatives, such as the Hard Disk Drive Cluster Committee supported by the NECTEC under NSTDA, are promoting the development of such linkages and provide ideal opportunities for Japanese firms to learn more about the potential for collaboration as well as concrete programs in which to participate.
- ***R&D and Innovation***. While R&D activities of MNCs in Thailand are generally very low, it is perhaps in other areas relating to the development of innovation capacity in a broader sense that Japanese firms could focus. A number of Japanese firms do undertake R&D and other innovation activities in Thailand, but these are generally not well linked into the Thai institutions that may have the technical and human resources to support them and generate synergies that could enhance the impact of the R&D activities being carried out.
- ***Information on Best Practice***. In most areas of business management, improvement in the dissemination of information on best practice in the Thai context could benefit the operations of all Japanese firms in Thailand. This could be through developing the activities of the Japanese Chamber of Commerce. One practical example could involve the careful consideration of the activities of

Seagate in the Hard Disk Drive industry to develop a wide range of linkages in areas relating to technology, human resource development, and R&D.[16]

[16] These activities have been carried out both on their own and through the disk drive industry association, IDEMA, and related activities. See Brimble and Doner, 2006, for more details.

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APPENDIX 1: SURVEY OF MULTINATIONAL COMPANIES IN THAILAND
A Comparison of Overseas Behavior of MNCs in Thailand

Sponsored by Japan Center for Economic Research
Implemented by Asia Policy Research Co., Ltd. and Larive (Thailand) Co., Ltd.

The objective of the survey is to examine the business behavior of foreign firms in Thailand for a research project sponsored by the Japan Center for Economic Research. The research attempts to understand the similarities and differences of business strategies and business performances of foreign firms. The results from the research would prove useful not only for businesses, which are eager to formulate efficient business strategies but also be beneficial for the Thai government, which is keenly interested in assessing the impacts of foreign firms on the Thai economy as well as formulating effective policies to attract FDI.

All information outside the public domain that is obtained from the survey will be treated in complete confidentiality, and used only for the research objective.

If you have any queries pertaining to the questionnaire, please do not hesitate to contact Ms. Tepin Getuadisorn at larivethailand@csloxinfo.com or 02 653 1948 to 1952 Ext 105.

Information on Company and Respondent

Name of Company	
Address	
Name of Respondent(s) & Position(s)	
Direct telephone line	
E-mail address	
Fax number	

A. GENERAL INFORMATION

1. Year of establishment: _____

2. Please indicate your company's ownership structure, in percentage terms:

1	Japanese	
2	US	
3	Thai	
4	Other (specify _____)	
5	Other (specify _____)	
	Total	100%

3. Please name your company's three main product(s) or product group(s) in Thailand.

		TSIC Code
1		
2		
3		

4. Please indicate your company's paid-up capital as of December 2004.

Million Baht

5. Total fixed assets of your company as of December 2004:

[Fixed assets includes land, buildings & civil works, leasehold improvements, equipment & machinery (including installation costs)]

Million Baht

6. Please indicate value share of machinery & equipment from home country as of December 2004:

Percent (%)

7. Employment Structure

7.1 Please indicate your company's employment structure as of December 2005 (number of employees), by management level.

a)	Senior managers, total	____
	1. local	____
	2. foreign, of whom:	____
	2.1 sent from parent company	____
b)	Middle managers, total	____
	1. local	____
	2. foreign, of whom:	
	2.1 sent from parent company	____
c)	Engineers, total	____
	1. local	____
	2. foreign, of whom:	
	2.1 sent from parent company	____
d)	Support staff (office)	____
e)	Factory workers	____
	Total Employees	____

7.2 What is the nationality of your company's Chief Executive Officer?

	Tick (√)
1. Local	____
2. Foreign	____
2.1 sent from parent company	____

B. SALES & PROFIT

8. Please indicate the total sales of your company at end of December 2004:

Total sales	Mil Baht
1. Local sales	Mil Baht
1.1 Foreign MNCs	_____%
1.2 MNCs from same home country ♦ Affiliated subsidiaries of same parent company in Thailand	_____% _____%
1.3 Thai companies	_____ %
2. Exports	Mil Baht
2.1 Home country ♦ Parent company & affiliates	_____ % _____ %
2.2 Affiliated subsidiaries in East Asia* except for those to home country	_____%
2.3 Affiliated subsidiaries in 3rd country excluding East Asia	_____%
2.4 East Asia except for those to home country	_____%
2.5 3rd country excluding East Asia	_____%

*East Asian countries include 10 ASEAN members; China, Hong Kong, Japan, Korea and Taiwan.

9. Please indicate your company's net profit at end of December 2004.

Million Baht

C. PROCUREMENT OF INPUTS

10. Please indicate your company's procurement of inputs in 2004:

Total procurement	Mil Baht
1. Local procurement	Mil Baht
1.1 Foreign MNCs	_____ %
1.2 MNCs from same home country ♦ Affiliated subsidiaries of same parent company in Thailand	_____ % _____ %
1.3 Thai companies	_____ %
2. Imports	Mil Baht
2.1 Home country ♦ Parent company & affiliates	_____ % _____ %
2.2 Affiliated subsidiaries in East Asia except those from home country	_____%
2.3 Affiliated subsidiaries in 3rd country excluding East Asia	_____%
2.4 East Asia except those from home country	_____%
2.5 3rd country excluding East Asia	_____%

D. PROCUREMENT OF MACHINERY AND EQUIPMENT

11. Please indicate your company's procurement of machinery & equipment in 2004:

Total procurement	Mil Baht
1. Local procurement	Mil Baht
1.1 Foreign MNCs	_____ %
1.2 MNCs from same home country ♦ Affiliated subsidiaries of same parent company in Thailand	_____ % _____ %
1.3 Thai companies	_____ %
2. Imports	Mil Baht
2.1 Home country ♦ Parent company & affiliates	_____ % _____ %
2.2 Affiliated subsidiaries in East Asia except those from home country	_____%
2.3 Affiliated subsidiaries in 3rd country excluding East Asia	_____%
2.4 East Asia except those from home country	_____%
2.5 3rd country excluding East Asia	_____%

E. SOURCE OF FINANCE

12. Please indicate various sources of finance at end of December 2004.

Total Loans	Million Baht
1. Local sources	Million Baht
2. Foreign sources	Million Baht
2.1 Home country	Million Baht
♦ Parent company	_____%

F. TECHNOLOGY TRANSFER

13. Please indicate method(s) used for transfer of technology to local staff:

On-the-job training	____ Yes ____ No
Training manuals (in-house)	____ Yes ____ No
Other training/seminars in Thailand	____ Yes ____ No
Training/seminars in parent company (home country)	____ Yes ____ No

14. How many patents has your company developed since operating in Thailand? _____

15. How much royalty has your company received from these patents? _____ Million Baht

16. Please indicate (√) if a local or a foreign staff (or both) is chiefly responsible for tasks below:

Task	Local	Foreign
1. Overall management		
2. Marketing		
3. Input procurement management		
4. Financial management		
5. Labor management		
6. Production management		
7. Inventory management		
8. Development of product management		
9. Development of new products		
10. Design technology		
11. Development of tools		
12. Improvement of production technology		
13. Quality control		
14. Maintenance & repair of equipment & facilities		

G. RESEARCH & EXPERIMENTAL DEVELOPMENT (R&D)

17. Does your company carry out R&D activities in Thailand? ____ Yes ____ No

[Note: Please see attached definition and examples of R&D activities.]

18. If Yes to Q17, please estimate your R&D expenditure for the latest year.

Year _____	Million Baht

19. Please provide the number of R&D personnel as of December 2005.

Total Number	_____ persons

H. BUSINESS RELATIONS

20. Please list all business clubs, associations, groups, affiliations, etc. in which your company is a member. [For example: Chamber of Commerce, Federation of Thai Industries, Electrical & Electronics Institute, Thailand Automotive Institute, Auto Parts Manufacturers Association of Thailand, etc.]

Name of Business Group
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

I. RELATIONS WITH GOVERNMENT

21. Does your company participate in public-private sector meetings? What types of meetings? How often?

_____

_____

_____

_____

THANK YOU FOR YOUR COOPERATION.

Research & Development Activities

Research and experimental development (R&D) in industry is defined as **creative work** which is undertaken on a **systematic basis** in order to create new or improved products, processes, services or other applications. R&D is distinguishable from other activities by the presence of a substantial **element of novelty** and by the **resolution of problems** and uncertainties using **scientific** or **technological** methods.

The three classes of R&D:

Basic Research: It is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts without any particular application or use in view. e.g publications in scientific and engineering magazines

Applied Research: It is also original investigation undertaken in order to acquire new knowledge. It is however directed at determining possible uses for basic research findings or finding new ways of achieving some specific predetermined objectives.

Experimental Development: It is systematic work, drawing on existing knowledge gained from research and practical experience that is directed at producing new materials, products, devices, installing new processes, systems and services or at improving substantially those already produced or installed.

Source: derived from the *Frascati Manual (OECD)*

Examples of the three classes of R&D In the Telecommunications Industry

Basic Research	**Applied Research**	**Experimental Development**
Study electromagnetic wave propagation at different frequencies	Study wireless technology emphasizing on cellular technology	Develop a mobile phone prototype

What is R&D?	**What is NOT R&D?**
• Development of prototypes	• Scientific and technical information services
• Construction of pilot plants	• Routine testing and standardization
• Trial production (if it implies full-scale testing and subsequent further design and engineering	• Patent and license work not related to any R&D project
• Industrial design and drawing directly linked to R&D	• General purpose data collection, including market research
• Technical activities carried out on new products & processes after they have been turned over to the production unit	• Feasibility and policy-related studies
• Industrial engineering and tooling up directly linked with the development of new products or improved products or processes	• Education, training, and after-sales services

Appendix 2: Basic Data for Surveyed MNCs (the number of respondents)

Automotive

	Japanese	Taiwan	Korea	Malaysia	Singapore	China	US	Netherlands	Sweden	UK	France	Denmark	Australia
Establishme	129	5	1	3	3	1	7	2	2	1	1	1	1
The year of establishment													
-1979	13						2	1	1			1	
1980-89	23	1			1	1	1						
1990-99	77	3	1	3	2		2		1	1	1		1
2000-	16	1						1					
Equity share													
-24	1												
25-49	27				1							1	
50-74	27	2		2	1	1	4						
75-99	34	2			1			1	1				
100	40	1	1	1			3	1	1	1	1		1
Employment													
-49	6	2		1			1						
50-99	4												
100-199	23						2	2		1			1
200-299	15	1			1								
300-499	34	1				1	3		1				
500-999	28		1	2	2		1		1		1	1	
1000-	18	1											
Profitability													
x<0	3			1	1		1		1				
0≦x<2.5	18	3							1		1		
2.5≦x<.5	16		1		1		1						1
5≦x<7.5	19				1			2					
7.5≦x<10	21						3			1		1	
10≦x<12.5	16					1	1						
12.5≦x<15	10			1									
15≦x<17.5	10	2		1									
17.5≦x<20	6												
20≦x5	7						1						

Electronics

	Japan	Taiwan	Korea	Malaysia	Singapore	Hong Kong	US	Canada	Netherlands	Germany	France	Switzerland
Establishme	55	15	5	1	3	2	3	1	1	1	1	1
The year of establishment												
-1979	3	0										
1980-89	21	4	3			1		1				1
1990-99	26	10	1	1	3	1	3		1	1	1	
2000-	5	1	1									
Equity share												
-24	1				1							
25-49	5	2	1									
50-74	4	1			1				1			
75-99	10	1		1	1							
100	35	11	4			2	3	1		1	1	1
Employment												
-49	2	2										
50-99	4	2	1									
100-199	6	4	1	1	1	1					1	
200-299	9	1	2		1		1		1	1		
300-499	6	1	1		1		1					
500-999	10	3										
1000-	18	2				1	1	1				1
Profitability												
x<0	8	4			1		1					1
0≦x<2.5	18	3	4	1				1				
2.5≦x<.5	10	2					1					
5≦x<7.5	3	1			2							
7.5≦x<10	5											
10≦x<12.5	3	1				1						
12.5≦x<15	2	1				1					1	
15≦x<17.5	0								1	1		
17.5≦x<20	0											
20≦x	5	3	1				1					

Source: Survey resutls.