CHAPTER 3

AN ANALYSIS OF THE SAMPLE DATA

3.1 Manufacturers in the sample

Based on the international standard industrial classification (ISIC), production in Thailand's manufacturing sector covers 23 manufactures, ranging from ISIC 15-37. In this study, we group all 23 manufactured activities into 9 distinct industries to make the analysis more concise[3]. The criterion of grouping is considered on the raw material and product of industry, any activity that used or produced similar raw material and output would be classified in the same industry. However, the manufactures are classified as follow.

1. Food and Beverage industry (hereafter food industry)
2. Textile, Apparel, Leather and Footwear industry (hereafter textile industry)
3. Wood, Wood Product, and Furniture industry (hereafter wood industry)
4. Paper and Allied Product, and Printing and Publishing industry (hereafter paper industry)
5. Chemical, Petroleum, Coal, Rubber and Plastic industry (hereafter chemical industry)
6. Non-Metallic and Mineral Product industry (hereafter non-metallic industry)
7. Basic Metal and Fabricated Metal Product industry (hereafter metal industry)

[3] Food industry is referred to industry in ISIC 15. Textile industry is ISIC 17-19. Wood, industry is ISIC 20, 36. Paper industry is ISIC 21-22. Chemical Industry is ISIC 23-25. Metallic industry is ISIC 26. Metal industry is ISIC 27-28. Machinery and Equipment industry is ISIC 29- 33. Vehicle and Transport Equipment industry is ISIC 34-35.

8. Machinery and Equipment industry
9. Vehicle and Transport Equipment industry

The data used for this study is taken from the firm-level data industrial survey by The Office of Industrial Economics, Ministry of Industry (MOI). The period covered is from 2001 to 2005. This survey on Thailand's industries is done annually in order to gain industrial data used in further industrial policy launching. The survey was first conducted in June 2002 to collect data of firms' performance in 2001, and was done annually. IFCT Advisory co.ltd. was signed to be in charge of surveying and collecting data. There are around 4,000 firms that responded to the questionnaire each year, and these firms are covered in four-digit ISIC 1511-3699.

As mentioned earlier, some filtration is operated. The responded firms are reduced from over 4,000 firms to 645 firms each year. Table 3.1 presents the share of sampling firms in 9 industries. In our sample, textile firms were the most intense, with 20 percent in total firms. Firms belonging to chemicals industry were 18 percent in the sample, followed by 14 percent of firms in food industry, and 13 percent in machinery and equipment, and vehicle and transportation equipment industries. The lowest distribution of firms in the sample is firms in the manufacturing of wood and furniture, paper and publishing, and non-metallic. All of them each distributed 7 percent in the sample.

It should be noted that the distribution of firms in the sample and in the real world industrial fact is slightly different. If the 2003 Manufacturing Industry Survey, conducted by National Statistical Office (NSO), is considered as the real world industrial fact, this survey disclosed that textile firms accounted for the largest share in total surveyed firms, with 37 percent in total firms. There is 28 percent that belonged to firms in food industry, followed by 19 percent for wood and furniture firms. Another 16 percent is scattered along paper, chemical, non-metallic, metal, machinery, and vehicle industries.

Table 3.1

Share of sampling firms in 9 industries (percent)

Industry	Share of firms	Industry	Share of firms
Food and beverage	14%	Non-metallic and Mineral Products	7%
Textile, Apparel, Leather and Footwear	20%	Basic Metal and Fabricated Metal	10%
Wood, Wood Products, and Furniture	7%	Machinery and Equipment	13%
Paper, Paper Products, Printing and Publishing	7%	Vehicle and Transport Equipment	13%
Chemicals, Petroleum, Coal, Rubber, and Plastic Products	18%	Total	100%

Source: Author's calculation from the sample

3.2 Foreign direct investment (FDI) and the role of foreign firms

FDI is an important factor in driving an expansion in manufacturing exports and investment, and changed the structure of Thai manufacturing sector from resource-based industry to more advanced-technology industry. The industrialization in Thailand has considerably depended on technology accompanying with the foreign firms. Without FDI, Thailand's manufacturing sector would not have been developed up to this point (Tambunlertchai, 2002). Host country gains many benefits from receiving FDI. For example, FDI directly provides additional capital funds to host economies which encouraged domestic production. The coming of FDI is more stable and reliable source of financing than portfolio investment which is rather volatile and short-run capital inflow.

To investigate FDI engagement and the role of foreign firms in the sample, we look at the share of capital held by foreigners. In this study, a firm is called foreign firm if it reports the share of capital held by foreigners at least 30

percent; otherwise it is classified as Thai firms. The majority of firms in the sample set are classified as Thai firms. As seen in table 3.2, there are 75 percent of total firms in the sample classified as Thai firms while foreign firms account for 25 percent in the sample.

Unfortunately, the ownership classification done by simply looking at the direct equity share alone might conceal the real ownership status. There are cases where firms with low foreign shareholding can have considerable influence on firms. Rather, one must examine the corporate control that may be indicated by several factors such as the voting share, the official signatory, the beneficiaries of the companies' profits, or the nationality of the majority of the directors on the company's board". Unfortunately, we have not completely acquired these data from the survey. Classification by percentage of shareholders is our best available data. However, we are not alone to classify ownership by the capital share, see for example, Opartpunyasarn (2007), Vishupong (2007), Kohpaiboon and Ramsetter (2008).

The destination of foreign direct investment (FDI) inflow has shifted over time. In the 1970s-80s, many inflows were contributed to the light consumption goods, namely, footwear and garment industries. In 1990s, FDI inflows were high concentration in machinery and equipment industry, and vehicle and transportation equipment, specifically in sub-division of manufacturer of office, accounting, and computing machinery, manufacturer of electronic valves and tubes and electronic component, manufacturer of television and radio receivers, and manufacturer of motor vehicle and parts. As seen in table 3.2, foreign firms concentrate in vehicle and transportation equipment, machinery and equipment, and basic metal and fabricated industries; that is, the share of foreign firms in these industries were 52 percent, 51 percent, and 41 percent, respectively. However, based on the industrial survey data from NSO, industries that are crowded by the percentage of firms receiving FDI and expected to be packed with foreign firms are machinery and equipment, vehicle, and chemical industry. Metal industry is plenty found with foreign firms in our sample but it does not show the same feature in the real world industrial fact.

Table 3.2

Share of firms classified by ownership and size (percent)

Industry	Ownership		Size	
	Thai firm	Foreign firm	< 500 persons	> 500 persons
Food and Beverage	84.6	15.4	61.5	38.5
Textile, Apparel, Leather and Footwear	87.6	12.4	58.2	41.8
Wood, Wood Products, and Furniture	77.8	22.2	66.7	33.3
Paper, Paper Products, Printing and Publishing	86.0	14.0	86.0	14.0
Chemicals, Petroleum, Coal, Rubber, and Plastic Products	76.5	23.5	82.6	17.4
Non-metallic and Mineral Products	83.7	16.3	76.7	23.3
Basic Metal and Fabricated Metal	59.4	40.6	87.5	12.5
Machinery and Equipment	49.4	50.6	65.9	34.1
Vehicle and Transport Equipment	47.8	52.2	69.6	30.4
Total	74.9	25.1	71.3	28.7

Source: Author's calculation from the sample

The arrived of FDI and the presence of foreign firms are likely to have more involvement in industries that rely on dynamic technology in which a proprietary asset and dominated by a handful of foreign firms, but the role of international firms will have less importance in industries that depend on mature, stable, and widely available technology, namely clothing, footwear, toy, and processed food industries. There is less need for local firms in these industries to share ownership and corporate control with foreign investors in return for accessing more advanced technology. The local and small firms are likely to be concentrated in these industries. On the other hand, production of industries such as motor vehicle, electrical appliances, and machine and parts requires more dynamic and advanced technology which is foreign proprietary asset (Kohpaiboon, 2005).

However, foreign firms can be involved in enterprises even without any equity participation; such involvement is through a non-FDI channel which can be classified into three modes, namely, technology licensing, international subcontracting, and foreign firm buyer channels. Technology licensing refers to a situation where local firms contact directly with foreign companies who are technology owners to gain rights of accessing those technologies. This can come in the form of technological assistance agreements, franchising, management contracts, and patent licensing. International subcontract or the so-called Original Equipment Manufacture (OEM) is associated with a contractor based in an industrialized country that passes on orders to sub-contractors in a developing country to produce components or assemble finished products, and distributes his final product in either his home market or a third-country market. Finally, foreign firm buyer is referred to the foreign trading company that is searching for potential supplier in developing countries to produce made-to-order products. Through these modes of involvement, firms with no capital held by foreigners may directly associate with the foreign firms which cannot avert from the effect of movement in exchange rates.

Kohpaiboon (2005) used the Industrial Census 1997 conducted by National Statistics Office (NSO) to reveal the level of FDI involvement in Thailand's manufacturing sector. The finding shows evidence that foreign firms are likely to be more export-oriented than local ones, export sales accounted for 45 percent in foreign firms, and 24 percent in domestic ones. Furthermore, Dhanani and Scholtes (2002)

disclosed that foreign firms had relied more heavily on imported content than local firms. The share of imported content in foreign firms was double that in domestic ones; that was 52 percent in the former, and 27 percent in the latter. Specifically, the more is the share of foreign-owned, the more is the reliance on imported content in a firm. Consistent with our sample data, foreign firms have relied more on export share and imported input share than in Thai firms. The average export share of foreign firms is 48 percent, and the average imported input share is 30 percent. In Thai firms, the reliance on export share accounts for 25 percent and 13 percent depends on imported content. Nikomborirak (2007) found that most foreign firms in manufacturing sector are export-oriented and are less dependent on the local market. However, foreign companies in certain industry sub-sector such as automotive, auto parts industry, and rubber tires and inner tubes industry occupy a majority market share in the domestic market.

In addition, Nikomborirak (2007) also showed that, after crisis, the structure of foreign shareholding mainly concentrated on a majority-foreign-owned. Consistent with Kohpaiboon and Ramsettter (2008), they found that a large portion of foreign firms with the minority-owned has been declining, instead the share of majority foreign-owned firms rose considerably from 34 percent in 1996 to 52 percent in 2006. The reasons are the loosening of Thai ownership restriction after the crisis, and the raising of its equity by foreign parent to prevent those joint ventures from bankruptcy. The percentage increase of a majority-foreign-owned implies the more influence of foreign ownership in Thailand's manufacturing sector.

In terms of firm size, the number of workers for firms in the sample lies between the minimum of 4 persons and the maximum of 8,446 persons. The average number of workers in a firm is about 500 persons. Foreign firms tend to be bigger than Thai ones. The average number of workers in foreign firms is 774 persons while the number of workers in Thai firms is 415 persons. Firm is considered as small firm if it employs lower than 500 persons, any firm with employees of more than 500 persons is thus regarded as large firm. As in table 3.2, most of firms in the sample are small firms. The share of small firms accounted for 71 percent in total firms while the share of large firms accounted for 29 percent. In addition, in a group of small firms, there are 22 percent classified as foreign firms, and 78 percent classified as Thai

firms. In a group of large firms, the percentage of foreign firms increases to 32 percent, yet the percentage of Thai firms decreases to 68 percent.

Moreover, there are unique significant features of financing investment behavior between Thai firms and foreign firms. Table 3.3.A exhibits source of funds between these two types of firms. Ownership share equity is the most outstanding source of funding while issuance of financial notes is the least important for manufacturing firms. Foreign-owned firms depend more on retained earnings than in Thai firms, but foreign firms borrow less from financial institutions. This is because foreign firms may have stronger financial position than Thai firms. In addition, these firms may be able to retain links with their parent companies in the form of intra-firm credit and capital increases. For foreign firms, 68 percent of source of investment funds are from domestic funding, and 32 percent from foreign funding. In contrast, Thai firms rely more heavily on domestic fund with 96 percent, only 4 percent of funds is foreign-sourced.

In terms of firm's size, the majority of source of funding in both firm-size small firms is ownership share equity; the minority is issuance of financial notes (table 3.3.B). Large firms depend more on retained earnings than small firms, which implied that small firms has limited ability to access internal fund than large firms. Likewise, the availability of external fund through credit from financial institutions in small firms is lower than in large firms. This implies that small firms have severity of financial constraint.

Table 3.3

Sources of funding

3.3.A: Sources of funding classified by ownership

	Ownership share equity	Retained earnings	Loan from financial institutions	Issuance of financial notes	Other sources
Thai firms	45.85%	15.45%	25.60%	1.58%	11.52%
Foreign firms	41.64%	29.14%	16.43%	0.77%	12.02%

3.3.B: Sources of funding classified by firm's size

	Ownership share equity	Retained earnings	Loan from financial institutions	Issuance of financial notes	Other sources
Small-sized firms	49.30%	15.97%	21.32%	1.08%	12.33%
Large-sized firms	33.64%	26.13%	28.22%	2.11%	9.9%

Source: MOI industrial survey, 2005

3.3 Manufacturing exports and imported content

Each firm covered in the survey differs in the extent of output distribution in domestic and export market, as shown in table 3.4. During 2001-2005, the sampling data shows that, on average, firms were domestic-market-oriented since the share of domestic sale accounted for 68 percent while export share was 32 percent of total sale. Although the export is a substantial issue for manufacturing sector, manufacturing firms in the sample have depended considerably on domestic market.

Table 3.4

Shares of domestic-export sale in total sales, and shares of imported input used in total production cost (percent)

	Share of domestic sales in total sales	Share of export sales in total sales	Share of imported input in total cost
Food and Beverages	64.06%	35.93%	10.15%
Textile, Apparel , Leather, and Footwear	61.32%	38.68%	17.99%
Wood products and Furniture	45.37%	54.62%	16.56%
Paper and Printing&Publishing	95.79%	4.20%	10.39%
Chemicals, Petroleum, Rubber and Plastic Products	77.55%	22.45%	17.68%
Non-metallic, Mineral products	72.52%	27.48%	7.40%
Basic metal and Metal products	74.49%	25.50%	20.13%
Machinery and Equipment	57.54%	42.46%	30.89%
Vehicle, Transportation Equipment	69.29%	30.71%	22.80%
Total	68.00%	32.00%	17.52%

Source: Author’s calculation from the sample

There are 4 industries containing the export share more than the average of 32 percent; these industries were wood and furniture industry, machinery and equipment industry, textile industry, and food industry. Industry with highest export

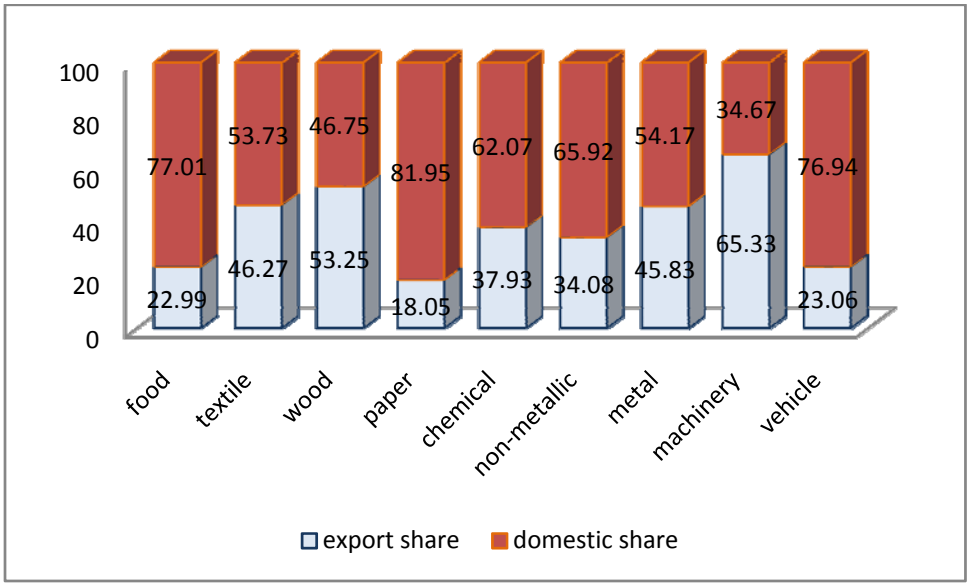
share is wood industry with 55 percent of export sales in total sales. This industry is expected to have highest effect of exchange rates on investment through export channel. However, the export share is also high in machinery and equipment with 43 percent, followed by 39 percent in textile industry, 36 percent in food and beverage industry, and 31 percent in vehicle and transportation equipment industry. Likewise, investment in these industries would have benefited from exchange rate depreciation through export channel. Industries with high export share would be highly susceptible to exchange rate movements through the channel of export exposure. On the other hand, industries with low export share would be less vulnerable to exchange rates through this channel.

Likewise, we also found from the input-output, 2000, NESDB, that manufacturing outputs in the real world fact were mainly produced to supply for the domestic market, as we could see from figure 3.1; over 50 percent of output produced was sold in domestic market in every industry except for machinery industry and wood industry. These two industries supplied output domestically by 35 percent and 47 percent, respectively.

The average export share in total output of the industrial facts was about 38.5 percent, which is similar to our sample data of 32 percent. As seen in figure 3.1, there were 4 industries that contain more shares than the average; these industries were machinery and equipment industry, wood and furniture industry, metal industry, and textile industry. However, in our sample, machinery, wood, and textile industries contain high share of export in accordance with the real world fact; but not in food industry.

Figure 3.1

Share of output distributed in the real world fact



Source: Input-Output Table, 2000, NESDB

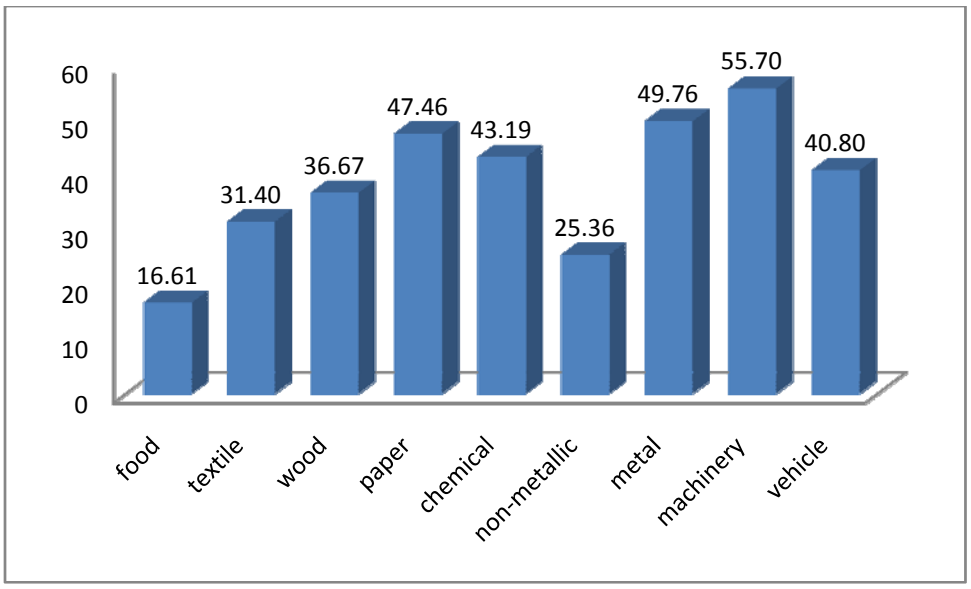
Regarding imported content, the top five imported raw materials are electronics parts, chemical products, metal and metal products, vehicle and parts, and plastic materials. Industry with reliance on these inputs is expected to be high import content industry. In terms of imported content, the sample showed a small portion of the reliance on imported content since the average imported input share accounted for only 17.52 percent (table 3.4). There are 5 industries that have imported input share more than the average in the sample; the reliance on imported content are high in industry that is non-traditional industry, namely, machinery and equipment, vehicle and transportation equipment, metal and metal product, textile, and chemical industries. Machinery and equipment industry is greatest reliance on imported input share with 31 percent, followed by vehicle industry with 23 percent, basic metal industry with 20 percent, and almost 18 percent in textile and chemical industries. These industries are expected to have high effect of exchange rates on investment through imported input channel. However, some industries such as food industry, wood and furniture industry, and non-metallic industry, implied the attribute of domestic resourced based industry, having low imported content. The inputs used in

these industries mainly concentrate on the natural resources which are available in the country so that they have enjoyed and took advantaged in domestically resources abundant.

However, the percentage of reliance on import content in our sample is far less than the reliance on import-content in total intermediate input cost, exacted from the input-output table, 2000. For example, the average of imported input share in total cost of the overall manufacturing was 38.5 percent. Imported content accounted for 56 percent in machinery and equipment industry, 50 percent in metal industry, 43 percent in chemical industry, 41 percent in vehicle industry, and 31 percent in textile industry (figure 3.2).

Figure 3.2

Share of imported input in total intermediate input cost



Source: Input-Output Table, 2000, NESDB

The effect of exchange rates on investment through export share and imported input share may underestimate. Firms will be affected by the indirect effect of exchange rates if those firms supply their output to exporting firms later on. Besides, domestic input which those firms utilize in the production may be imported in the first place. However, we cannot access the information on how firms supply

their output or how firms involve exporting firms. In addition, we have no data reference to the domestic intermediate inputs that consisting of earlier imported materials.

Foreign firms have relied more on export share and imported input share than Thai firms (table 3.5). The average export share of foreign firms is 48 percent, and the average imported input share is 30 percent. In Thai firms, the reliance on export share accounts for 25 percent and 13 percent depends on imported content. The presence of foreign ownership might drive an industry to engage more in international trade as seen in machinery and equipment, and vehicle and transportation equipment industry. These industries are found to have high export share and imported input share with high percentage of foreign-owned firms. However, industries namely wood and furniture, food, and textile industry have high export share, but the percentage of foreign firms in these industries are still small.

Large firms are likely to engage more of export share and imported input share than small firms (table 3.5). The dependence on export share in large firms accounts for 51 percent, and 25 percent of the reliance on imported input share. However, small firms rely on 23 percent of export share and 14 percent of imported input share.

Table 3.5

Export share and imported input share classified

by firm's nationality and firm's size

Ownership	Export share	Imported input share	Size	Export share	Imported input share
Foreign firms	48%	30%	Large firms	51%	25%
Thai firms	25%	13%	Small firms	23%	14%

Source: Author's calculation from the sample

3.4 Markups of manufacturing industries

Measuring the market power can be expressed in terms of the inverse of the elasticity of demand facing the firm. This has implication on the pricing behavior or the so-called markup pricing. If the firm's elasticity of demand is large, the markup will be small and we say that the firm has very little monopoly power. On the contrary, if the firm's elasticity of demand is small, this markup will be large, and this firm will have considerable monopoly power (Pindyck and Rubinfeld, 2001). However, this study investigates the effect of exchange rates on investment by considering the market power implied by markup. Firms with high markup will have more ability to stabilize their export prices in foreign currency. This means that markup varies with the exchange rate changes to absorb the changes in exchange rate. Therefore, investment in high markup firms would be less sensitive to exchange rate changes.

The price-cost markups in the sample have ranged from 1.49-2.10. The average markup was about 1.62, indicating the existence of market power in manufacturing firms in the sample. Industry with price-cost markups higher than one means that industry is in a market that is far from competitive ones. Table 3.6 presents the degree of markup in each industry in the sample. Industries with high-markups were non-metallic and mineral products industry, basic metal and metal product industry, and vehicle and transportation industry. Interestingly, industries with high markup were mainly domestic-oriented ones. Since domestic-oriented industries are considered as basic import-substitution industries. These industries may generate the monopoly power due to the barrier to entry since they need high amount of investment so that this limited the number of firms in industry. Industries with low markup, however, were food industry, textile industry. Consistent with Kohpaiboon and Ramstetter (2008), traditional labor intensive industries like food and textile industry experience lower concentration in the market.

Table 3.6

Price-cost markups

Industry	2001	2002	2003	2004	2005	2001-2005
Non-metallic, Mineral products	2.022	2.101	2.067	2.037	2.022	2.050
Basic metal and Metal product	1.724	1.738	1.705	1.698	1.697	1.713
Vehicle and Transportation	1.766	1.791	1.710	1.598	1.535	1.680
Wood products and Furniture	1.689	1.676	1.597	1.589	1.583	1.627
Paper and allied products, Printing and Publishing	1.612	1.620	1.587	1.637	1.631	1.617
Machinery and Equipment	1.566	1.613	1.621	1.560	1.536	1.579
Chemicals, Petroleum, Coal, Rubber and Plastic Products	1.594	1.580	1.552	1.590	1.555	1.574
Food, Beverages and Tobacco	1.614	1.594	1.552	1.510	1.503	1.555
Textile, Apparel and Leather	1.489	1.522	1.503	1.514	1.568	1.520
Total	1.628	1.642	1.612	1.604	1.600	1.617

Source: Author’s calculation from the sample

There seems to be no clear relationship between the degree of markup and the form of ownership. The entry of foreign firms may increase the market power or stimulate competitiveness. Foreign companies in certain industries sub-sector such as automotive, auto parts industry, and rubber tires and inner tubes industry occupy a majority market share in domestic market, implying that the entry of foreign firms brought about the concentration in these industries (Nicomborirak, 2007). However, foreign firms may break down entry barriers, be a source of technology transfer, and spillover to local firms.

In our sample, industries with high markup could have either high or low percentage of foreign firms. For instance, non-metallic industries showed less share of

foreign-owned while metal industry and vehicle industry, were concentration with high share of foreign-owned. This implies that the entry of foreign firms was in accordance with the increasing concentration in the two industries. Moreover, industries with high concentration contain low share of export, but having high imported content (metal and vehicle industries). The regression result of Kohpaiboon and Ramstetter (2008) disclosed that foreign ownership and the international trade activities had weak effects on concentration and thus the market power; that is, foreign-owned and exporting firms did not have a strong tendency to be the largest firms.

Low markup firms in the sample account for 66 percent of total firms while high markup firms account for 34 percent. The average number of workers in low markup firms is greater than in high markup firms; that is, 517 persons in the low markup firms, and 483 persons in the high markup firms. The mean of markup price in small firms equal to 1.61, and is greater than 1.56 in large firms. In terms of ownership, price-cost markup, on average, of foreign firms is higher than in Thai firms; that is, 1.70 in foreign-owned firms, and 1.56 in Thai firms. Furthermore, export and imported input shares in low markup firms are slightly higher than in high markup firms. Export share of low markup firms is about 31 percent while high markup firms shows 29 percent of export share. Imported input shares of low markup and high markup firms account for 19 percent, and 13 percent, respectively.

Combining the data mentioned about firm's share of export and imported input, markup, firm size and ownership, we infer that the average export share of firms in the sample is about 32 percent. In addition, there are 40 percent of firms in the sample reporting export share more than the average export share in the sample. The average reliance on imported content is only 18 percent of total production cost. There are 32 percent of firms reporting imported input share more than the average value, and 68 percent of firms in the sample has reliance on imported input lower than the average value. The sampling is dominated by the firms containing small share of imported input in the production.

Foreign firms are likely to have higher export and imported input share, higher degree of markup price, and larger firm size than in Thai firms. However, foreign firms in the sample are dominated by a higher percentage of Thai firms. Large

firms, is dominated by a higher percentage of small firms in the sample, tend to have more share of export and imported input, more percentage of foreign-owned firms than in small firms. In high markup firms, the average number of workers is less than in low markup firms. This implies that high markup firms have smaller size than in low markup firms. It might be because of the characteristic of capital-intensive industry of the high markup industry. The reliance on export share and imported input share in high markup firms are lower than low markup firms as well.

3.5 Industries' characteristics

Apart from the data of firm-level, it is interesting to analyze the data of industry-level. In this section, we will detail the characteristics of 9 industries. The summary of the characteristics of each industry is shown in table 3.7.

Industries with high export share are wood and furniture industry, machinery and equipment industry, food industry, and textile industry. Industries with relied more on imported input share are machinery and equipment industry, vehicle and transportation equipment industry, metal industry, textile industry, and chemical industry. Industries with high markup price are non-metallic industry, metal industry, and vehicle industry, which have less reliance on export share. On the contrary, food, textile, and machinery and equipment industries have low markup but high degree of export share dependence.

Food and beverage industry is characterized by industry with high share of export but low share of imported content. The reliance on less imported content implied the attribute of domestic-resourced-based nature of this industry. The abundance of natural resource and the experience in food processing as the long-lasting traditional industry causing food products from Thailand has high reputation in international market, especially for canned pineapple, canned tuna, processed chicken, and processed shrimp. Export of food products are mainly distributed in international market through foreign buyer agents without our own brands. Measured by FDI inflow, the foreign presence in food industry seems small. However, the low level of foreign capital share might suggests the presence of foreign firm involvement through

non FDI channel such as acquiring knowledge of international market (Kohpaiboon, 2005).

Table 3.7

Summary of the data

industry	Export share (x)	Imported input share (α)	Foreign ownership	MKUP
Food and Beverage	High x			
Textile, Apparel, Leather, and Footwear	High x	High α		
Wood and Furniture	High x			
Paper, Printing, and Publishing Chemicals, Rubber, and Plastic		High α		
Non-metallic and Mineral Product				High MKUP
Metal and Fabricated Metal		High α	High percentage of foreign firms	High MKUP
Machinery and Equipment	High x	High α	High percentage of foreign firms	
Vehicle and Transportation Equipment		High α	High percentage of foreign firms	High MKUP

Source: Summary from the sample data

Note: Industries specified with “high x” refer to industries with export share of more than 32 percent, the average level of export share in the sample. Industries specified with “high α” refers to industries with imported input share of more than 17.52

percent, the average imported input share of the sample. Industries specified with "high percentage of foreign firms" means industries with a high percentage of foreign firms in the industries. Industries specified with "high MKUP" means industries with markup of more than 1.62, the average of markup in the sample.

Textile industry was developed first as an import substitution industry and then increased its export orientation in the mid- 1970s, when garment and textile exports increased rapidly. The upstream companies (cotton and artificial fiber-spinning) target most of their production to the local weaving mills, these mills in turn supply a garment sector. Textile companies can manage their production by supplying the local market only, and then finding an outlet in exports. The remainder operates through trading companies, or under sub-contracting arrangements with local manufactures and/or exporting firms. Among non-exporting firms are those that choose to sell to the local market such as department stores, or have acquired licenses to produce fashionable international brand. The characteristic of textile industry's production could be under their own brand or flexibility to adapt their production to a wider range of customers' order (Simon, 1996). Textile industry, however, contains high share of export sales in total sales, and high share of imported input used in the production so it is expected to be influenced by exchange rates through both export and imported input channels. In terms of foreign firm engagement, the manufacturers in textile industry, namely apparel, footwear, and leather seem to be less concerned with the role of foreign firms, but the low level of foreign shareholding in this industry could suggest the presence of foreign firms through non-FDI channel. Local firms may become involved in the foreign firms via foreign buyers' mode. There are foreign firms that are operating under their own brand names searching for potential suppliers to manufacture made-to-order products. Although foreign companies have higher international marketing knowledge, they are unlikely to establish their own affiliates because of the industrial characteristic of labor-intensive production. Thus, it would be more beneficial for foreign firms to play a role as a contactor and place orders to local subcontractors (Kohpaiboon, 2008).

For wood and furniture industry, the share of output export was around 55 percent of total output, implying a high degree of exchange rate exposure through

export channel in this industry. The availability of domestic input means this industry contain low share of imported input in total cost. The reliance on domestic input accounted for 80 percent while the rest of 20 percent of inputs were imported. More than 60 percent of furniture products are made from rubber trees, about 30 percent of them from particle boards, and the last of 10 percent is from hardwoods. All of these materials are commonly found domestically. Production of furniture supplied for domestic market is mainly on stable furniture or furnished furniture whereas production for export market is a kind of knock-down furniture which is made to order for customers. Output of this industry was majority supplied in export market, and minority supplied in domestic one. Most of the products for local market were the products with some defects which were rejected from the export (Liewprasert, 2000).

Paper, printing and publishing industry is a domestic market oriented industry. The share of domestic sales in total sales accounted for 96 percent while export production is limited so that export share of this industry is figured only 4 percent. In addition, the share of imported input accounted for 10 percent of total cost, which is relatively less than highly reliance on imported content industry. Characterized as technology and capital intensive industry, it is highly linkage between downstream manufacture of paper, and upstream manufacture of printing and publishing. Moreover, this industry is evidenced by low degree of markup, and non-existence of foreign firm involvement.

Chemical, petroleum, rubber, and plastic product industry is characterized by capital-intensive and domestic market-oriented industry. The share of domestic sales of this industry accounts for 78 percent of total sales. The nature of sub-division chemical product, petroleum refineries, and plastic product manufacturers are domestic-oriented. However, Thailand is largest exporters of rubber and rubber products, namely field latex, sheet rubber, and block rubber in the world market. In sample data, this industry has high import content by the average of 18 percent. The sub-divisions of chemical and plastic are more reliance on imported input. The limited investment in R&D, and technology development led this industry to rely more on imported input used in the production.

Non-metallic and mineral product industry is domestic-oriented industry with the reliance more on domestic inputs. The effect of exchange rates on investment

in this industry seems to be low since this industry is not vulnerable to exchange rates through export and import input exposure channels. In addition, since the degree of markup of this industry is high, it may dilute the effect of exchange rates on investment.

Metal industry was primarily import-substitution industry to supply for the domestic demand, and be responsible for supporting the development for another economic sector in the country such as construction sector. However, the effect of the crisis decreased the metal demand as the linkage industries such as vehicle and construction industry sector were severely contracted. Export strategy was instead utilized to release some of excess outputs. Moreover, the deterioration of metal firms affected by the crisis led industry to be restructured by increasing the share of foreign joint-venture, thereby the role of foreign firms in this industry is apparently by the distinct share of foreign-owned firms in the sample. The sub-divisions with high export share were manufacturers of non-ferrous metal, furniture and fixtures metal, and structural metal product, export share in total output were 63 percent, 61 percent, and 71 percent, respectively. Imported input was heavily used in metal and metal products industry since the production in this industry is restricted on the intermediate and final process of production (for example, hot and cold-rolled steel industry) as there is no upstream steel industry (namely steel smelting factory) in Thailand. As a result, this industry relied heavily on imported input, such as iron, steel, metal, used further in the intermediate and final stage of production (Waitalertsak Yabuchita, 2006). Nevertheless, metal industry is classified as high markup firm, which is likely to absorb much of the effect of exchange rates in their markups, so the effect of exchange rates on investment in this industry may be alleviated.

Machinery and equipment industry mostly distributed the output internationally as appeared that the share of exports in total sales accounted for 43 percent. The top three manufacturing exports currently are machinery and mechanical appliance (namely, computer, and computer parts), electrical apparatus for electrical circuit (namely, integrated circuit, parts of integrated circuit, and telecommunication equipments), and electrical appliances (namely, air-conditioner, radio, television, fan, and refrigerator), with the share of 15 percent, 14 percent, and 8 percent of total

exports, respectively.[4] The high percentage of output export inevitably led this industry to be highly exposed to the movement in exchange rates. Imported content was the most concentration in machinery and equipment industry. The production in this industry is relatively new in Thailand since it has just been developed since 1990s, when Thailand was an attractive location for assembly activities. Thus, inputs used in the production are not domestically available but are mostly imported. Besides, the production is limited to use those imported input to be assembled. This implies limited capability and lacked deepening development of this industry. In addition, machinery industry is one of the industries that receive a hugh amount of FDI, therefore foreign firm involvement is striking in this industry through FDI-channel.

The Thai government has long attempted to promote and develop vehicle and transportation equipment by granting many of incentives and providing protection. It has therefore recently become the regional hub in Southeast Asia for several leading manufacturers of cars and vehicle parts. Industrialization of vehicle industry was as a result of multinational companies (MNE) entry. Open investment policy and economic incentives had led MNE in several world leading vehicle manufactures. Vehicle industry is classified as domestic market-oriented import-substitution industry. Having been affected by the crisis, this industry was in trouble by the severe reduction in domestic demand. Export strategy was instead utilized to substitute the overcapacity in domestic market. As we could see that its average share of export in total output accounted for 31 percent, during 2001-2005. Regardless of transportation equipment manufacturer, sub-division of motor vehicle and repairing alone would have higher export share of over 40 percent. In addition, this industry is highly import-dependent; the average share of reliance on import input in the sample is 23 percent of the total production cost. The nature of the motor vehicle manufacturer is to assemble component and equipment that are both imported and local content. The abolishment of the local content requirements (LCR) measure in 2000 would have caused the decrease in local content component, yet increased the import content in the production. To cushion the adverse impact of LCR abolition, the

[4] BOT, statistics of economic and financial (2000)

tariff rates on completed knockdown kit (CKD) were raised. Notwithstanding, the share of imported component and equipment of motor car had been decreasing since 2003, this is due to the relocation of vehicle and parts international company to Thailand and there was a quality improvement in outputs produced by local suppliers, therefore the local components were much more employed (Kohpaiboon, 2005).