

CCAS Working Paper No. 25

December 2009

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# **The Origin and Growth of Local Entrepreneurs in Auto Parts Industry in Thailand\***

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## Abstract

The automotive industry has been the driving force behind Thailand's industrialization. Foreign direct investment—particularly from Japan—has immensely contributed to the progress of the automotive industry. This paper will analyze how local entrepreneurs have emerged and built up their businesses in the auto parts industry in which Japanese capital has been dominant. Two outstanding first-tier Thai suppliers are investigated. These suppliers started of in the small-scale repair industry, and the regulations mandating local content in automobile production that were applied by the government in 1975 provided them with an opportunity to expand their businesses. In terms of technology, they have been heavily dependent on Japanese assemblers and auto parts manufacturers. They have tried to introduce Japanese technology through joint ventures and technical assistant agreements with Japanese manufactures. This helped their businesses develop into large suppliers offering products that are competitive in Asia. Basically, Japanese automobile business circles in Thailand have tried to introduce the Japanese style of manufacturing in Thailand. However, technology transfer is only halfway toward completion and some attempts to accelerate the technology transfer form Japan have been made.

*JEL Classification:* L26, L62, O14, O53

*Key Words:* auto parts industry, entrepreneurs, entrepreneurship, technology transfer

## 1. Introduction

Thailand, one of the most successful economies in the world, has achieved high and sustained growth in the postwar period.<sup>1</sup> In short, Thailand has succeeded in industrializing its economy. In the process of industrialization, which began around 1960, the automotive industry grew to be one of the representative industries in Thailand. The industrialization policies of the Thai government and foreign direct investment (FDI), mainly by Japanese automotive companies, have contributed greatly to the development of the Thai auto industry. Japan has been the largest investor in the Thai automotive industry.<sup>2</sup>

The country moved into first place in the production of one-ton pickup trucks in 2005, outstripping the United States (*Bangkok Post* March 29, 2006). By 2007, Thailand was the 15<sup>th</sup> largest country in the world in terms of vehicle production (Table 1), and the first among the Southeast Asian countries. Moreover, in that same year, Thailand ranked as the second-highest (behind the United States) in terms of the production and export of pickup trucks in 2007.<sup>3</sup> As these data show, the Thai automotive industry was a remarkably successful case of building up a new industry in a developing economy, and the expansion of car production has contributed greatly to transforming Thailand from an agricultural economy into an industrial one.

In the development of the Thai automotive industry, FDI by Japanese automotive companies played a very important role. Japanese capital has had a great presence in the Thai automotive industry, including supporting industries in the country.<sup>4</sup> Thai capital is largely limited to small and medium-sized enterprises (SMEs) in supporting industries; however, there are several outstanding local entrepreneurs who have established competitive auto parts companies.

This paper intends to clearly show that Thai capital in the auto parts industry has grown, by mainly analyzing two local first-tier suppliers. Analysis is focused on how local Sino-Thai entrepreneurs' small businesses have expanded into competitive first-tier suppliers in the auto parts industry of Thailand.

In reviewing economic development in Thailand, the role of Thai capital in the auto industry is a fundamentally important issue. This is because: (i) the auto industry is an important industry in

Thailand and its contribution to the Thai economy is significant (discussed in section 2), and (ii) foreign capital, particularly Japanese capital, has been such a driving force in the growth of the Thai auto industry which has become an important production and export center for Japanese companies. Local entrepreneurs who have been successful in establishing competitive auto parts companies in this Japanese capital-dominant industry should be noted as important players in the economic development in Thailand.

## 2. The Present Situation of the Thai Auto Industry

Among developing economies, Thailand has been one of the most successful in terms of development of the automotive industry. The year 2005 was a memorial one for Thailand in that car production exceeded one million units for the first time in that year. Thereafter, production of automobiles maintained steady growth and hit about 1.39 million in 2008.<sup>5</sup> Among the Southeast Asian countries, Thailand presently produces by far the greatest number of automotives. This shift is remarkable, particularly when it is noted that in 1973, Malaysia was the largest country in terms of car production in the region (Bloomfield 1978:268–71); but by 2007, the number of cars produced in Thailand was nearly three times the number produced in Malaysia (Table 7). According to the Board of Investment (BOI), Thailand is aiming to be the “Detroit of the East” and rank among the top ten countries in the world in terms of car production by 2010.<sup>6</sup>

The high percentage of commercial vehicles (trucks and buses) characterizes automobile production in Thailand. Commercial vehicles made up 71.3 percent of total automobile production in Thailand in 2008, while passenger cars constituted only 28.7 percent (TAI 2009). One-ton pickup trucks comprise most of the commercial vehicles produced in Thailand. Production of one-ton pickup trucks reached about 820,000 units in 2005, making Thailand the highest-ranked producer of one-ton pickup trucks in the world and surpassing the United States. Of the total, 53.6 percent of automobiles produced in Thailand are exported, and in 2007, one-ton pickup trucks made up 74.6 percent of all exported automobiles (TAI 2009).

The reason why Thailand became the main production and export base of one-ton pickup trucks can be attributed to both Thai government policies and Japanese automakers’ strategies. After car production began in Thailand, it became clear that Thai consumers preferred pickup trucks to

passenger cars because the price of diesel oil was set cheaper than that of gasoline. Moreover, the excise tax on pickup trucks was lower than that on passenger cars. In response to these policies and consumer preferences, Japanese automakers placed shifted its emphasis on production of pickup trucks in Thailand.<sup>7</sup>

The automotive industry has contributed greatly to the Thai economy. This industry employed 220,000 workers or 0.62 percent of the employed labor force in 2004.<sup>8</sup> In addition, the automotive industry produced 16 percent of the value added created by the manufacturing sector, and employed 8 percent of the labor force working in Thailand's manufacturing sector in 2007.<sup>9</sup> As the data in Table 2 indicate, labor productivity of the automotive industry (including the auto parts industry) is outstandingly high in Thailand.

As shown in Figure 1, vehicle production and export experienced steady growth until the Asian economic crisis in 1997. Following the crisis, the automobile industry increased exports in order to compensate for the sharp decrease in domestic demand. Exports<sup>10</sup> grew steadily and by 2007, exports of automobiles and auto parts represented 10.9 percent of total exports, exceeding domestic sales for the first time. These data indicate that the automotive industry is one of the leading sectors in Thailand.

There are 17 automotive assemblers operating in Thailand today<sup>11</sup> (Table 3 shows 15 of the 17). Japanese automakers dominate the production, market and export of automobiles (Tables 4, 5 and 6).

3. The Automotive Industry from the Viewpoint of Industrialization in Developing Economies  
The automotive industry has been an industry that many governments of developing economies have been eager to promote for the purpose of industrialization; Thailand is no exception. Protective policies for the automotive industry were introduced at the beginning of the 1960s, when Thailand first began import substitution industrialization.

There are several good reasons why developing economies adopted this strategy of establishing the automotive industry as a means towards industrialization. First, the automotive industry can

produce striking forward- and backward linkage effects on the economy, and as such, is often called an “integrated industry.” An automobile is built by assembling as many as 30,000 parts<sup>12</sup> and each part utilizes various types of machine-building technology<sup>13</sup> (Adachi, Ono and Odaka 1983:377; JSAE 2008:3; Okada 1983b:5). Materials used in producing automotive parts are also varied—they include, for example, metal, plastic, glass, rubber, textiles, leather, paint, oil and so on (JSAE 2008:3)—and each material needs a different processing technology. If growth of the automotive industry has a strong backward linkage effect and stimulates the production of auto parts, it can contribute greatly to the spread and development of modern technology across the economy. This is what policymakers of developing economies expected from the expansion of the auto industry. Automotive production can also produce a forward linkage effect. Industries such as maintenance and repair, and consumer credit will develop as vehicle production increases. In addition, marketing and distribution will become more effective through increases in car production.

Second, technology transfer from developed economies is expected. This will help with the accumulation of human capital, which is crucial for industrialization in developing economies. Third, the automobile assembly industry, together with supporting industries, can create employment for a large number of workers. And finally, the automotive industry was selected as one of the strategic industries by governments because modernization or development was symbolized in car production. For many political leaders, the automotive industry was a symbol of the modern economy and technology; many therefore directed their economic development programs with the auto industry as a focus,<sup>14</sup> probably because they thought that only developed economies, with their modern technology, could be engaged in car production.<sup>15</sup>

#### 4. Development of the Auto Industry in Thailand

Bloomfield (1978:150–51) describes that “there have been two main ways in which automotive industries have evolved on the world periphery.” The first is through commercial development and the second has been through autonomous development with the help and support of government. He argues that the former was “encouraged and promoted by national governments but with a high degree, if not total involvement, of the world corporations.”

The case of Thailand is a typical and successful example of the first channel. FDI encouraged by the

government's preferential treatment has sustained growth of the automotive industry in Thailand. Multinational companies, particularly Japanese firms, have been deeply involved in expansion of the industry.

Bloomfield (1978:151–52) classified the first type of development into four stages as follows:<sup>16</sup>

- Stage 1: Import of completely built-up (cbu) vehicles by local retailers (around 1900–60)
- Stage 2: Assembly of completely knocked-down (ckd) vehicles imported from the home plants of world manufactures (1961–74)
- Stage 3: Assembly of ckd vehicles with increasing locally made content (1975–99)
- Stage 4: Full manufacture of motor vehicles (2000–present)

In Thailand, the first automobile was imported by the royal family around 1900 (Siriboon 1983:180). Thailand shifted to the second-stage with the start of industrialization in the beginning of the 1960s by introducing import substitution policy. The assembly of ckd Ford automobiles began in 1961 by Thai Motor Industries, Ltd. (the company had been established in 1947 to import Ford cars). While this was the first auto assembly plant in Thailand (Suehiro 1989:174), the market for passenger cars was very small at that time. For example, the demand for passenger cars was only 3,232 units in 1961 (Patcharee 1985:104). The 1962 Industrial Promotion Act classified the auto assembly industry as a Group B industry, granting a 50 percent reduction on import duty and taxes on ckd components.<sup>17</sup>

As a result of this Act, twelve foreign assemblers began operations in Thailand between 1962 and 1974 (Suehiro 1989:209): seven were Japanese assemblers (Nissan, Toyota, Daihatsu, Mitsubishi, Isuzu, Hino and Mazda), two were American assemblers (Ford and GM) and three were European (Fiat, Mercedes-Benz and Volvo). Ford and GM were established in 1970 and 1972, respectively, and planned to produce “Asian cars” in Thailand. However, they withdrew in 1976 and 1977, respectively, because of weak sales (Higashi 1995:40, Suehiro 1989:208).

Since then, Japanese brand-name cars have dominated the Thai market. The market share of Japanese cars reached as high as 91 and 90 percent in 1978 and 1982, respectively (Siriboon 1983:Table 4.2, Suehiro 1989:208). Japan's five automakers (Toyota, Isuzu, Mitsubishi, Honda and

Nissan) still maintained an 88.5 percent market share in July 2006, although Ford and GM began operations again in Thailand in 1998 and 2000, respectively (Ueda 2007:93).<sup>18</sup>

In 1969, the Ministry of Industry (MOI) began to intervene and developed policies toward the automotive industry and established the Automotive Industry Development Committee.<sup>19</sup> In 1971, the MOI introduced a local content requirement for automotive production that was applied beginning in 1975 (Office of Industrial Economics 2006:8). It was at this time that Thailand entered stage 3.

The strategy behind the local content program was to support expansion of supporting industries. The intent of the program was to create employment and accelerate technology transfer from developed countries. In addition, Patcharee (1985:143) points to another reason why the Thai government clung to the introduction of a local content formula. Since the late 1960s, there was an anti-foreign investment sentiment in Thailand that was due to the deficit in the balance of payments, and in 1972, a boycott movement against Japanese goods gained ground among students. It was thus understandable that the Thai government focused on promoting local industries by implementing a local content formula.

At first, the local content requirement was set at 25 percent for passenger cars and 20 percent for pickup trucks (based on CIF price). According to Patcharee (1985:117), automobile assemblers in Thailand had already been using some locally-made parts such as tires, batteries, paints, lubricants, and so on when the local content formula was introduced. Even so, the level of local procurement was only about 5–10 percent (based on CIF price) and assemblers therefore had to explore and find new suppliers when the local content formula was applied.

According to a former Vice President of Toyota Motor Thailand, when the local content program began, Japanese automobile assemblers in Thailand aggressively searched for local auto parts suppliers, whose products fulfilled the necessary quality and price requirements. During the same period, some Japanese auto part affiliates of Japanese assemblers began to set up operations in Thailand.<sup>20</sup> In conjunction with this, the Thai government began to promote the auto parts industries and BOI granted them special privileges following introduction of the local content

requirement.<sup>21</sup>

Not surprisingly, Japanese companies—which had a great influence on the Auto-Parts Industry Club (APIC), a subsection of the Association of Thai Industries (ATI)<sup>22</sup>—were against the local content requirement. Local Thai auto parts makers, who welcomed the higher local content requirement, countered APIC by establishing another association, the Thai Auto-Parts Manufacturers Association (TAPMA) in 1978 (Doner 1991:200, Higashi 2000:140). In addition, local Thai auto parts makers were successful in exerting pressure on the government, and in 1978, the MOI announced that the local content requirement would be raised from 25 percent to 50 percent within five years. Moreover, the way in which local content was calculated was also changed to a point-based approach in 1978. By 1987, the local content requirement was raised to 54 percent for passenger cars and 70 percent for pickup trucks. Those levels were maintained until the end of 1999 when the local content requirement was abolished by MOI (Kriengkrai and Thammavit 2004a, Figure 3; Kriengkrai and Thammavit 2004b, 153).<sup>23</sup>

Following the 1978 announcement, Japanese car assemblers needed to promote local auto parts manufacturing. They thus asked Japanese auto parts manufacturers with which they had business relationships in Japan to offer technical training to Thai auto parts manufacturers. The intent was to increase purchases of auto parts from Thai manufacturers (Higashi 1995:42).

In 1989, the government mandated car makers to use locally-made engines for assembling pickup trucks. At the same time, a local content formula was introduced for the production of pickup truck engines. The formula was initially set at 20 percent, and the plan was to raise this to 80 percent within seven years (Higashi 1995:41).

According to Dicken (1992:286), local content requirements, together with various kinds of tariffs and nontariff import restrictions, have been the basic measures of import substitution policies enforced by developing economies, particularly during the 1950s and 1960s. He describes that “in most cases local content requirements were set at between 50 and 90 percent, usually on a progressively rising scale over a period of several years.” Judging from this criterion, Thailand maintained a slightly lower level of local content than other developing economies.

Patcharee (1985:133–34) states that the automobile industry was divided into two groups: auto parts makers and automobile assemblers. The local content formula exercised an effect on these two groups differently. The former benefited handsomely by the introduction of local content. On the other hand, it burdened automobile assemblers with a higher production cost because local parts were more expensive than imported ones. Automobile assemblers settled this problem by raising the market price of automobiles. In this way, consumers had to bear the cost of local content and passenger car sales declined sharply in 1975 and 1976 (Patcharee 1985:147–48).

The local content requirement was continued at considerable cost. According to Adachi and Siriboon (1982:20), “battery is the only item for which the local part registers absolute lower price. Other parts carry cost penalty at about three times that of CKD counterparts on the average.” A former Vice President of Toyota Motor Thailand also noted that supporting industries were expanded through the policy of local content requirement. However, auto parts produced by them were so expensive that assemblers had to raise the price of automobiles.<sup>24</sup>

Besides local content, the automotive industry was protected by high tariffs and an import ban. The Ministry of Finance raised the tariff on cbu passenger cars and ckd passenger car components from 80 percent to 150 percent and from 50 percent to 80 percent, respectively, in 1978 (Higashi 2000:136, 139). In the same year, the Ministry of Commerce (MOC) banned the import of cbu passenger cars of less than 2300 cc. This import ban and the higher local content requirement resulted in an increase in the prices of passenger cars. For example, during the period 1972–78, passenger car prices rose 20–30 percent (Patcharee 1985:162). It is thus clear that the Thai automotive industry was heavily protected from foreign competition for several decades.

This paper argues that the automotive industry in Thailand attained the fourth stage of full manufacturing around 2000. One rationale behind this is that the local content formula was abandoned in 2000. The Thai government had already begun to liberalize the automotive industry in the 1990s. For instance, in 1990, the MOI abolished the limits on the number of series of passenger cars assembled.<sup>25</sup> The MOC lifted the ban on the import of cbu passenger cars of less than 2300 cc. in 1991.<sup>26</sup> In addition, the tariff on cbu automobiles and ckd components was lowered markedly in

1991. The ban on new assembly plants, put into effect in 1978, was lifted in 1993.<sup>27</sup> However, local content requirements formed the core of import substitution policies and played a prominent role in protecting local auto parts manufactures. Therefore, it is fair to say that the Thai automotive industry entered a new era of full liberalization when the local content program was removed.<sup>28</sup>

Second, there are presently as many as 1,800 automotive suppliers in Thailand (Table 7).<sup>29</sup> As indicated by the data in Table 7, this number is outstanding among Southeast Asian countries. In addition, Thailand far exceeds other Southeast Asian countries in automobile production, and has established itself as the leading center of automotive production in the region.

As a result, the Thai automotive industry has increased local procurement. The share of parts produced by local manufacturers<sup>30</sup> reached 80–90 percent for pickup trucks and 30–70 percent for passenger cars in 2008.<sup>31</sup> In the case of Toyota, it established research and development center in Thailand in 2005, and thus Toyota Motor Thailand contends that local procurement, even in research and development, is proceeding in Thailand.<sup>32</sup>

Third, the Thai auto parts industry is rated high in evaluations. A survey by JETRO Bangkok Center (2006:107–08) shows that Thailand is superior to other Asian countries (Malaysia, Indonesia, the Philippines and China) in terms of competitiveness<sup>33</sup> in machining parts such as stamping parts, tail lamps, brakes and parts, and flywheels. In addition, the press working technology—which can be subclassified into press forming technologies, press machines and press molds—is being improved in Thailand. Among the three, press forming technologies have achieved steady advancement in Thailand and have attained a level similar to that of Taiwan (JSAE 2008:131).

According to the Executive Managing Coordinator of Toyota, the quality of Thai Toyota's automobiles is at the topmost level among automobiles manufactured by Toyota all over the world. Furthermore, in some cases, the overall quality of automobiles manufactured by Toyota in Thailand is rated higher than that of automobiles manufactured by Toyota in Japan. The Takaoka factory in Japan achieved the lowest defect rate in manufacturing of Corolla's among Toyota factories in the world, while a Thai factory ranked third. The tact time—that is, the time needed to manufacture one unit of product—is almost the same in Japanese and Thai Toyota factories. In other words,

factories in Thailand are run as efficiently as those in Japan.

Efficient delivery contributes to the growth of the automotive industry in Thailand. According to JETRO Bangkok Center (2006:6), almost all auto parts can be delivered to and provided for automobile assemblers in less than two hours in Thailand. This is a highly favorable condition for assembling vehicles, in comparison with India where an insufficient infrastructure retards delivery or with China which has to maintain additional stock because of uncertainty in electricity supply.

Several Japanese car makers have located R&D centers in Thailand as well, and they function as a regional R&D center in Asia. Isuzu, for example, announced in 2006 that it would build the development function of its R&D center, Isuzu Technical Center of Asia (which was established in 1991). In addition, Toyota and Honda established R&D centers in Thailand in 2003 and 2005, respectively. These initiatives indicate that the automotive industry in Thailand has matured to the point where Thailand can function as a regional R&D center for the industry.

Data reveal that the technology of manufacturing automobiles has improved steadily in Thailand and has now reached the stage of full manufacture. However, we should note that this could not have been achieved without FDI from Japan. Bloomfield (1978:150) states that, in the peripheral areas, “any motor vehicle industry has been largely developed by diffusion from the core areas” and that “most of the motor industry in the peripheral region is controlled by the large world corporations of the core regions.” Moreover he notes that the development of the automotive industry in Thailand has been led by major motor vehicle companies of developed countries, especially Japan. This point is analyzed in greater detail in section 6.

##### 5. Profiles of the Founders of Local Auto Parts Manufacturers

This section introduces the profiles of two Thai entrepreneurs who succeeded in establishing representative enterprises in supporting industries. Both are Sino-Thai businessmen who built their auto parts businesses from scratch, and their companies have now grown into large and competitive first-tier suppliers.

The analyses of Group A and Group B are based on data gained through interviews with these

entrepreneurs' family members, conducted in 2006 and 2007, and founders' *nangsu cek*<sup>34</sup> that were published in 1998 and 2002, respectively.

### 5.1 The Founder of Group A

Group A is one of the leading enterprises in manufacturing auto parts (such as axle shafts, coil springs, disk breaks and drum breaks) in Thailand today. Mr. X, founder of the Group, was born in Bangkok in 1922 and was a second-generation Hainanese Chinese.<sup>35</sup> While Mr. X was born poor and was not able to receive a proper education, he was industrious and diligent. His initial business dealings involved sugar.

Mr. X began to work at an auto repair shop, the most famous in Bangkok at that time, at the age of 12 in 1934.<sup>36</sup> He worked there for several years and gained knowledge about the mechanism of automobiles. At the same time, he was able to accumulate capital to start his own business.

In 1940, when he was only 18, Mr. X opened his own shop which dealt in auto parts such as spark plugs, batteries and driving belts. The knowledge of automobile repair and auto parts that he gained while working as a mechanic at the repair shop was helpful in his business of trading those products. His business was so successful that he decided to expand his business, and in 1951, he established an importing company of auto parts. This company became the starting point of today's Group A.

Mr. X imported various auto parts from foreign countries, particularly from Japan, for customers throughout the country. Because he frequently visited Japan to import auto parts, he established personal relationships with several Japanese business persons in the circle of automotive industries, relationships that later proved to be an asset.

The auto parts that he imported from Japan were selling so briskly that he came to think of manufacturing them for himself. He visited his business acquaintances in Japan, and based on their advice, established his first factory in Bangkok in 1961. This factory was initially involved in the manufacture of leaf springs for the REM (replacement equipment manufacturing) market, and was a pioneer among Thai manufacturers of springs used for automobiles. Brake parts were also produced for the REM market at this factory.

At the time that he began to manufacture leaf springs, the Vietnam War had just erupted. Because these leaf springs were used in U.S. Army trucks, demand at that time was high, and Mr. X's factory enjoyed large sales; his business prospered.

According to a Japanese engineer who worked for Group A for more than 20 years, it must have been difficult for Mr. X, who had no formal education, to manufacture the leaf springs by himself. A difficult heat treatment is necessary to produce these springs and it has been suggested that Mr. X enlisted the help of some Japanese engineers for technical expertise.

Cooperation from Japanese companies has been also integral to the success of Group A. It was in 1977 that Mr. X began producing auto parts such as springs for the OEM (original equipment manufacturing) market by establishing a company with registered capital of 25 million baht. In the same year, this company concluded a technical assistance agreement with Mitsubishi Steel Manufacturing Co., Ltd., a Japanese steel company, which enabled Mr. X to clear away a technical obstacle to enter into the production of OEM auto parts.

As noted in a previous section, the local content requirement was applied in 1975. Therefore, demand for OEM auto parts manufactured in Thailand increased significantly after 1975. Mr. X took advantage of this to expand his businesses by receiving technical assistance from a Japanese company. Since OEM auto parts are used for assembling automobiles, higher manufacturing technology and greater safety to satisfy assembler's requirements are necessary for producing these products. Mr. X, who had no formal education and learned techniques by himself based on his experiences, had no choice but to introduce advanced technology from a Japanese company.

Since then, Group A has imported new technology from several Japanese companies through technical assistance agreements and joint ventures. A Japanese engineer of the Group explained that technical assistance agreements with Japanese companies have been one way to introduce the high technology that the group doesn't have yet, and to improve the manufacturing technology for it. The Group still keeps its technical assistance relationship with Mitsubishi Steel Manufacturing Co., Ltd., and Mitsubishi is in charge of the development of new springs. Regarding springs, Group A

depends totally on a Japanese steel maker to develop new products. At present, the Group has technical assistance agreements with five Japanese companies.

On the other hand, the number of joint ventures with Japanese companies rose to nine by 1997. Joint ventures have been effective ways to expand business and diversify into new products for the Group. However, after the 1997 Asian financial crisis, the Group had to offer shares in joint ventures in order to pay their debts. The joint venture established in 1989 with Asahi Tec Corporation, a Japanese company specializing in aluminum alloy casting, is a typical case in point. When established, Mr. X's family had a 50% stake in this joint venture, while the Japanese company owned 49%. After the crisis, Mr. X's family sold almost all of its shares to the Japanese counterpart company. As a result, his family currently has only a 1% stake while the Japanese counterpart has 99%. Nevertheless, one of Mr. X's sons is still serving as vice president of this joint venture company.

Thus, by employing Japanese technology through technical assistance agreements and joint ventures with Japanese manufactures, Group A grew to be a representative first-tier Thai supplier. In 2003, OEM auto parts made up the majority of products of the Group and REM auto parts occupy only 8% of total sales. This suggests that the Group has been successful in developing finer qualities of products. The largest customer is Mitsubishi Motors (Thailand), from which the Group is also receiving technical assistance, and other customers include Auto Alliance, Toyota and GM. Products from Group A are exported to Japan, Malaysia and Indonesia, although only 6% of total income was obtained from direct exports in 2003. Clearly, this group has grown to be a competitive manufacturer in the auto parts industries in Thailand.

In addition to technical assistance agreements and joint ventures with Japanese companies, the Group employs twelve Japanese engineers. One of these engineers explained that, while in general, Thai wholly-owned manufacturers like Group A are inferior in technology to Japanese manufacturers or joint ventures between Thai and Japanese capital, Group A has reached a fairly high level of technology among auto parts manufacturers in Asia. Its Thai engineers are so capable that they can handle various problems, such as mechanical breakdowns, that occur in the production process without the help of Japanese engineers. However, Thai engineers continue to require

assistance from Japanese engineers when they carry on developmental work.

Group A's chief rivals are Japanese manufacturers operating in Thailand. According to a Japanese engineer of the Group, it is able to manufacture the same high-quality and high-productivity springs as its Japanese competitors do. However, the Group lacks the ability to develop new products. Furthermore, it must sell its products slightly cheaper than its Japanese rivals. This may suggest that Thai companies like Group A are at a disadvantage against Japanese companies in gaining the trust of customers.

At present, Group A consists of four companies. The company that fills the central role in the Group owns a 99.99% stake in the other three companies. This company listed its stocks on the Thai Stock Market and became a publicly-owned company in 2004. However, the largest two shareholders of this company are Mr. X's family members and the holding company of the Group in which Mr. X's family has a 100% stake. As of 2007, they had about a 54% ownership of this company's stock. Therefore, Group A is characterized as a family business.

Mr. X died in 1998. Among his ten children, five are presently involved in the management of the Group. One son, an executive vice president of the core company of the Group, obtained a masters degree in engineering from Waseda University in Japan. After his graduation, he worked in Japan for the company with which the Group had technical assistance agreements. It was clear that Mr. X had sent one of his children to Japan to study engineering and Japanese because his company had built a very close business relationship with Japanese companies and Japanese technology. He understood well that deepening the knowledge of engineering in Japan would be crucial for the Group's success.

His son's experience with working for a Japanese company helped the Group develop a stronger partnership with it. This son served as president of TAPMA, the association of auto parts manufacturers.<sup>37</sup> This suggests that the Group is one of the most influential companies among auto parts manufacturers in Thailand.

Among Mr. X's children who are involved in management of the Group, there is only one child who

is familiar with engineering, while the other four children have little or no knowledge of engineering. This suggests that the Group is heavily depending, in terms of manufacturing technology, on Japanese counterpart companies with which the Group has developed relationships and on Japanese engineers employed by the Group. The Group is typical of Thai manufacturers that have built powerful businesses from scratch, relying on the Japanese for technical support.

## 5.2 The Founder of Group B

Dr. Y, founder of Group B, one of the largest Thai companies in the automobile parts industry, established his business empire in one generation. The Group is so large that it is comprised of 38 companies; 23 are wholly Thai-owned and 15 are joint ventures with foreign companies, mostly Japanese.<sup>38</sup> The number of workers employed by the Group is about 18,000.

Mr. Y was born in Bangkok in 1947 as a second-generation Teochiu Chinese. His parents were immigrants from China and made a livelihood selling noodles from a stall in Thailand. He attended primary school for only two years when he was a child, and it was not until the age of 23 that he finally graduated from a primary school. He was given the designation of “Dr.” by Ramkhamhaeng University, in 1996, after he succeeded as a businessman. He died in 2002 at the age of 55.

As a child, Mr. Y helped his parents in their noodle stall during the day and worked for a repair shop of motorcycle seats with his older brother at night. One day, a customer asked Dr. Y if he could make a motorcycle seat for him, and Dr. Y managed to complete the order. Following this, orders for motorcycle seats gradually increased. Later, he began receiving orders from Japanese motorcycle makers such as Honda and Suzuki. The business of producing motorcycle seats went so well that in 1960 at the age of 13, Mr. Y opened a workshop at his house producing motorcycle and automobile seats, in cooperation with his older brother and a friend.

In 1964 when Dr. Y was 17 years old, he and his older brother became independent of this workshop, and established a small factory that produced motorcycle seats. The factory received orders from Honda and Yamaha. His timing was fortunate as it was during this same year that Honda and Yamaha established companies as motorcycle distributors in Thailand. Furthermore, Yamaha began to assemble motorcycles as ckd production in 1966, and Honda followed suit in

1967. This probably increased his chances of expanding his businesses although he was manufacturing seats for the REM market. While his business prospered, Dr. Y was concerned about the long-term prospects of production of seats. One of his customers suggested that he manufacture other auto parts.

The turning point came in 1971 when Dr. Y (at age 24) established a factory to produce REM motorcycle parts, the first factory of motorcycle parts in Thailand. In that same year, the MOI announced its policies for the motorcycle industry: the local content requirement for motorcycle production was set at 50% and motorcycle makers were expected to meet the requirement within two years. Japanese motorcycle makers had difficulties in securing OEM parts in Thailand because there was no first-tier or reliable suppliers at that time.

Thus, soon after Dr. Y opened his factory, he received an order to produce OEM motorcycle parts from Japanese makers. He went to Japan and purchased used Japanese machines to produce stamping OEM parts for Yamaha, Honda and Suzuki. Those Japanese makers provided his factory with dies and molds to manufacture stamping parts because his factory was not able to make dies and molds at first.

At that time, his factory did not employ any foreign or Japanese engineers. Because Mr. Y did not receive a formal education in engineering, it may be supposed that Japanese motorcycle makers provided him with, not only dies and molds, but also some advice about manufacturing technology. In this way, the introduction of a local content requirement by the government gave Dr. Y a chance to start producing OEM motorcycle parts. He succeeded in taking advantage of the opportunity presented by the policy of local content requirement and obtained the cooperation of Japanese makers as well.

In 1977, Dr. Y's business expanded into manufacturing automobile parts on a large scale. He established a company that provided the starting point for Group B as an automobile parts maker. As mentioned above, the local content requirement was applied to the automotive industry in 1975, and subsequently, demand for OEM automobile parts manufactured in Thailand increased. This was another opportunity for Mr. Y to again extend his businesses and he made use of this great

opportunity. The Group explains that its business of manufacturing auto parts grew dramatically for a decade after 1977.

The company began to produce OEM automobile parts and employed some Japanese engineers for the first time in 1982 (or 1983). This means that Japanese engineers were necessary for the company to start production of automobile parts for the OEM market, probably because Dr. Y was not able to surmount an engineering problem without Japanese engineers' help. This shows again that he was highly dependent on Japanese technology for manufacturing OEM parts. At present, 40 foreign engineers, all Japanese and all of great importance to the Group, are working for the Group, including joint ventures.

Since the early 1980s, Group B has deepened its relationship with Japanese companies through technical assistance agreements and joint ventures. The Group explains that it has solved problems with production by concluding technical assistance agreements with Japanese manufacturers, when it received orders for auto parts that presented great difficulty. For example, in 1987 it concluded a technical assistance agreement with a Japanese company that specialized in plastic parts for automobiles. According to this Japanese company, Mitsubishi Motors (Thailand)<sup>39</sup> decided to entrust the production of plastic parts to the Group, and asked this Japanese company (a wholly owned affiliate of Mitsubishi Motors in Japan) to enter into a technical assistance agreement with the Group. The Group has been heavily indebted to this Japanese company for technical support. The Group is now producing all instrument panels used for one-ton pickup trucks of Mitsubishi Motors (Thailand), and is also exporting these panels.

Instrument panels are among the most difficult parts to manufacture among plastic auto parts; it is also one of the products that require the most sophisticated technology to manufacture. This is because they have complex production structures and involves various technologies, such as injection molding and coating. After the Group receives an order from Mitsubishi Motors (Thailand), this Japanese company provides full support by contracting to design, prepare for dies and molds, and complete the products. In short, instrument panels are manufactured by using the technology of this Japanese company although they are products of the Group.

Joint ventures with Japanese companies are another way of expanding the business for the Group. The number of joint ventures in which it is involved currently stands at 15, and all of these joint ventures are with Japanese companies. When the Group enters into production of safety critical parts or parts that are difficult to manufacture, its policy is to manufacture these products in the form of a joint venture.

Joint ventures with Japanese counterparts have been a great help toward clearing up engineering difficulties encountered by the Group. For example, stamped closure panels like doors, one of the most difficult products to manufacture among the Group's products, are manufactured by a joint venture, established in 1997, with a Japanese company. This Japanese company specializes in the production of automobile doors and their dies in Japan. The Group is receiving the full technological support of this Japanese company, and this enables the Group to enter into the production of doors.

Two other Japanese auto parts manufacturers that have established joint ventures with the Group (in 1988 and 1993, respectively) did so at the request of the Japanese automakers (Mitsubishi and Honda respectively), their customers in Japan. The rationale behind the request was the higher local content requirement which was raised in the latter half of the 1980s in Thailand.<sup>40</sup> Japanese automakers in Thailand needed to encourage their Japanese suppliers to advance into Thailand in order to fulfill the local content requirement. Simultaneously, the expansion into Thailand furnished a solution for these Japanese suppliers who were suffering from an appreciation of the yen. At that time, the Thai government had imposed limitations on the shareholding of FDI whereby FDI was not allowed unless it had a Thai majority shareholding structure. Therefore, Mitsubishi and Honda in Thailand arranged joint ventures between these Japanese suppliers and the Group.

In this way, government policies—such as the local content requirement and the limitation on the shareholding of FDI—greatly benefited Dr. Y's businesses. Those who received preferential treatment through these protective policies toward the automotive industry were those like Dr. Y, Sino-Thai entrepreneurs who were establishing a big business.

The limitation on shareholding was lifted after the economic crisis in 1997, and wholly

foreign-owned enterprises are now allowed to invest in Thailand. However, the Group has continued to keep its joint ventures operating, reflecting the Group's policy that joint ventures continue the lasting relationship with its partner companies. This can be interpreted to mean that the Group needs joint ventures for business expansion. The Group has noted that most of its customers are Japanese companies and that they place a greater reliance on Japanese suppliers (including joint ventures) than Thai ones. It is suggested that Thai suppliers may encounter difficulties in dealing with Japanese customers. Therefore, the Group recognizes the necessity for joint ventures with Japanese manufacturers.

One of the Japanese partner companies in the Group's joint ventures explains that it controls production management and technology under contract to the Group. On the other hand, the Group has general charge of applications with the government and personal management. This Japanese company says that it has no intention of transferring its manufacturing technology into the Group. If the contribution of joint ventures to technological development in the Group has been feeble, as this case suggests, joint ventures are merely a tool for expanding business and pursuing profits for the Group. Another comment made by the Japanese company is that Sino-Thai entrepreneurs are significantly different from their Japanese counterparts in terms of their attitude toward businesses with the former being profit-oriented while the latter is production-oriented.

The Group states that it would be extremely difficult to expand production of OEM auto parts without support from Japanese manufactures, even in the future. It is fair to say that Japanese manufacturing technology, which is embodied in technical assistance agreements and joint ventures with Japanese manufactures, forms the basis of the Group.

On the other hand, the Group has developed technology, through its own efforts, in producing some auto parts such as seats. It established a factory producing automobile seats for the Malaysian national car Proton in Malaysia in 2000. A second factory was built in Malaysia in 2003. In these factories, there are no Japanese engineers; rather, Thai engineers have been in charge of technology. This can be explained by the fact that Dr. Y began to supply Honda and Yamaha with motorcycle seats in the early 1960s, and thus the Group has considerable experience in producing seats. It ultimately mastered the manufacturing technology of seats and its seat production sector forged into

a foreign country.

Furthermore, the Group was independent of Japanese manufacturers in producing motorcycle parts and stamping parts from the start. It has never entered into joint ventures with Japanese manufacturers in producing these parts. Since the Group started stamping parts (OEM) for motorcycles in 1971, it has more than 30 years' experience in producing stamping parts, and they represent the largest share of the Group's sales at present. In 2003, it established a motorcycle parts factory in India, a joint venture with an Indian manufacturer of sheet metal components, and in this factory, Thai engineers of the Group are in charge of technology.

All of this suggests that the Group has reached such a high level of production in seats and stamping parts that it has been able to expand its business overseas. In addition, its products have become competitive in world markets. Direct exports have boosted its share of production to 50–60 percent, and the number of export markets for its products is about 140 countries.

The Group explains that it has been managed as a family business by the clan of Dr. Y. In the case of the core company of the Group, four family members of Dr. Y own nearly a 100% stake.<sup>41</sup> After Dr. Y's death in 2002, his wife became president of the group. His children, who studied engineering in Japan or England, are also involved in the family business and two are board members in the Group.

## 6. Characteristics of First-tier Thai Suppliers

Based on my survey of two outstanding first-tier Thai suppliers, their characteristics can be analyzed as follows.

### 6.1 Origin of the Thai Auto Parts Industry

The two case studies suggest that the origin of the Thai auto parts industry lies in the repair industry. Both founders of Group A and Group B began their business careers in their youth as an automobile or motorcycle mechanic. Both had very little formal education and began working at repair shops as mechanics without knowledge about modern manufacturing technology. They were second-generation Chinese who were born poor and, because of the poverty, were unable to receive

proper education. In addition, they both had to work to support their families from childhood. However, their experiences as mechanics led them to enter into the auto parts industry.

History shows that the repair industry played a crucial role in exploiting human resources in the auto industry. Founders of Chrysler and Honda had experience working as mechanics (Honda 1962, Langworth and Norbye 1985). Soichiro Honda (Honda 1962:263), founder of Honda, stated that he was able to acquire techniques as a mechanic, learn automobile structure, and master how to repair and drive a car, while he worked for an automobile repairing factory for six years in his youth. His experience shows that the techniques learned through repairing automobiles, provided the starting point for his career in motorcycle and automobile production.

In Thailand, the first automobile was introduced by the royal family around 1900. While it is difficult to determine when the first private repair shop was established in Thailand, at least in the middle of the 1930s, several auto repair shops existed in Bangkok as the story of Group A's founder suggests. In general, repair of motorcycles and automobiles are easier industries to start than is the manufacturing of these products. The necessary capital to enter the repair business was limited, and complicated know-how was not required to repair some kinds of parts such as tires and seats.

My survey suggests that young Sino-Thai boys working for repair shops provided the starting point of the auto parts industry in Thailand. The founders of Group A and Group B, making use of their careers as mechanics, advanced into manufacturing auto or motorcycle parts later in their lives. At first, they started to produce REM parts.

Their businesses made a great leap in the 1970s. In that decade, the Thai government introduced a local content requirement for motorcycle and automobile production. This policy to protect domestic parts manufacturers was a turning point for both entrepreneurs, and they embarked on manufacturing OEM parts in the 1970s.

However, both received very little formal education and encountered difficulty in employing the latest technology in manufacturing OEM parts. They had no alternative but to depend on Japanese manufacturers and engineers in terms of technology. They needed to employ Japanese technology

because Japanese cars dominated the domestic market in Thailand in the 1970s. The founders of Group A and Group B pursued several methods such as technical assistance agreements and joint ventures with Japanese manufacturers, and the employment of Japanese engineers, in order to overcome these technological problems.

It is fair to say that only Sino-Thai entrepreneurs who could afford to conclude technical assistance agreements, launch joint ventures, and employ Japanese engineers were able to take advantage of the opportunity and expand their businesses into OEM production when the government introduced the protective policy. In other words, the government policy handsomely benefited some Sino-Thai entrepreneurs who had capital and experience in manufacturing REM parts.

## 6.2 The Overwhelming Superiority and Importance of Japanese Technology

The Thai automotive industry has been heavily dependent on Japanese manufacturers for technology since the 1960s. Japanese automobile assemblers and parts makers have contributed greatly to the development of the automotive industry in Thailand, although most began their businesses in Thailand as joint ventures with Thai capital.<sup>42</sup> The strategy of depending on foreign capital was in sharp contradiction with the import substitution policy of that time, which aimed to protect domestic industries for autonomous industrialization. However, Thailand had no choice but to invite investment from foreign countries in order to overcome the problem of technology.

The machinery industry has played a crucially important role in the process of industrialization. Okada (1983b:1) describes that some degree of proficiency in machine-producing technology is necessary for developing economies that aim at industrialization through import substitution and/or export promotion. In order to pursue continuous manufacturing operations, “the economy must be capable of supplying basic tools and equipment, various machine parts and components as well as maintenance and repairing services” (Okada 1983b:1).

It is questionable whether Thailand had enough machine-building technology to execute industrialization policies all by itself when import institution began around 1960. It would be difficult to identify the exact origin of machine-producing technology in Thailand. However, the maintenance and repair services of various machines such as automobiles would be one sector that

provided Thailand with the preconditions of industrialization in terms of technology. As Ishikawa (1983:xii) explains, “most of the small- and medium-sized, technologically less sophisticated machine-producing firms originate in the maintenance and repairing services of the imported machinery.”

My survey reveals that some car-repairing factories were already operating by the middle of the 1930s in Bangkok. However, according to Siriboon (1983:180), the market for motor vehicles was small in Thailand even after World War II. Noppadol (1995:Table 3.1) estimates that domestic demand<sup>43</sup> for automobile (passenger cars plus commercial cars) was only 6,860 units in 1961. It would be natural to think that the market for automobiles was limited and that the car-repairing industry was not dynamic enough to develop machine-building technology broadly in the beginning of the 1960s when industrialization policies were introduced.

Thailand was thus ill-prepared for starting industrialization due to its lack of technology, especially machine-building technology.<sup>44</sup> Therefore, the Thai government tried to address this technological problem by inviting foreign automobile assemblers, many of which were Japanese. Thailand adopted the strategy of welcoming foreign manufacturing companies in order to bring in modern technology that it did not have. Furthermore, Thailand employed a pragmatic strategy of establishing an automotive industry by depending on foreign brands, rather than rely on building its own Thai brand.<sup>45</sup>

In this way, automobile production in Thailand has occurred mainly by using Japanese technology. A Japanese engineer who has worked for Group A comments that Japanese manufacturing technology has controlled the Thai automobile industry since the beginning. First, this is because Japanese automakers have dominated production, and second, even in the case of Japanese automakers like Mazda, Isuzu and Mitsubishi, in which U.S. or European manufacturers have a stake. Technological matters were left in the hands of the Japanese. Because Japanese technology has dominated that of other countries in the Thai automotive industry, Japanese engineers have played a crucial role in the transfer of technology from Japan to Thailand.

According to this study, Thai manufacturers have adopted four ways in trying to introduce Japanese

manufacturing technology. The first is to employ Japanese engineers directly. In the case of Group B, a Japanese engineer was employed for the first time in the beginning of the 1980s when the Group began to produce OEM parts for automobiles. The Group needed Japanese engineers in order to solve technical problems when it entered the new market that required higher qualitative standards, and since then, it has continued to employ Japanese engineers.

It is noteworthy that technology transfer from a Japanese company to a Thai company has been sometimes arranged among Japanese engineers. According to a Japanese parts maker operating in Japan, when it teaches its manufacturing technology to Group B under a technical assistance agreement, it does so to Japanese engineers, not Thai ones, working for the Group (however, the technology is finally accessible to Thai engineers of the Group). However, Japanese engineers on both sides play a key role in transferring the technology from Japan to Thailand. This symbolizes a problem of the Thai auto industry, that is, a lack of engineers who understand the Japanese way of manufacturing products or the spirit of *monozukuri* as mentioned in the next section.

Another Japanese company operating in Japan and which has entered into a joint venture with Group B explains the role of Japanese people in the Thai auto industry as follows. Japanese manufacturers have maintained the spirit of *monozukuri* which means “creative manufacture” or “handcraft.” This spirit deeply influences not only the Japanese technology, but also the Japanese way of doing business and Japanese thoughts on business. However, Thai manufacturers lack this kind of spirit. When Thai auto parts suppliers deal with Japanese manufacturers, it is very difficult for the former to understand the latter; and this poor communication may disrupt their businesses. Therefore, it is not true that Thai companies need to employ Japanese people just because of the problem of language; rather, Thai manufacturers come to employ Japanese people who understand the spirit of *monozukuri* if they want to keep their businesses with Japanese manufacturers going well.

The second way for Thai manufactures to introduce Japanese technology is to conclude technical assistance agreements with Japanese companies that operate in Japan and that specialize in the necessary technology. In the case of Group B, these agreements enabled the Group to expand its businesses into new OEM products. The Group made technical assistance agreements with Japanese

manufacturers when it started production of new products. Group A also concluded agreements with five Japanese companies. According to Group A, it is company policy that new technology should be introduced by making technical assistance agreements with Japanese manufacturers if the company lacks some technology. Both cases show that Thai manufacturers can purchase the latest technology by concluding technical assistance agreements with Japanese companies. This is an advantage that a latecomer such as Thailand can enjoy as the historian, Gerschenkron (1962:8, 127, 203-204) argues.

In the case of Group B, Mitsubishi Motors (Thailand) Co., Ltd arranged a technical assistance agreement between the Group and an affiliate of Mitsubishi Motors in Japan. This affiliate notes that the Group manufactures instrument panels by completely employing the technology that the affiliate has developed. Furthermore, the affiliate teaches all of the latest technology to the Group. According to the Mitsubishi affiliate, Thai engineers eventually become capable enough to handle most of the manufacturing process without the help of Japanese engineers.

However, design is the exception. It is extremely difficult for Thai engineers to develop designs and thus this affiliate contracts to complete this part of the production process. Furthermore, Thai engineers lack the ability to conduct research and development, the affiliate explained. This case shows that Group B cannot be independent of its Japanese counterpart in terms of technology, despite the fact that more than 20 years have passed since the technical assistance agreement was initiated.

A third way to absorb Japanese technology is to enter into joint ventures with Japanese auto parts makers operating in Japan. Group B explains that the joint venture is a useful method to solve the problem of manufacturing technology when it launches into new products. The number of joint ventures that the Group has set up with Japanese companies now stands at fifteen. The Group has built a small business up into a large one by forming many joint ventures.

In a joint venture established in 1988 between a Japanese company and Group B, the Japanese company provides continual training to Thai engineers of the Group in its factory in Japan. The present factory manager of this joint venture is a Thai engineer who had been trained in Japan. This

case suggests that the technology transfer from Japan to Thailand has made progress through joint ventures.

However, this joint venture, which is involved in producing engine parts for Mitsubishi one-ton pickup trucks, cannot be managed without Japanese engineers. The Japanese auto parts maker stations two Japanese engineers at this joint company. This may be because engine parts are critical safety parts that are rather difficult to manufacture.<sup>46</sup> This Japanese maker explains that Japanese engineers are necessary for doing business in Thailand because *monozukuri* in the Thai automobile industry is largely based on Japanese technology and because almost all customers are Japanese.

One of two Japanese engineers is responsible for the maintenance work of equipment in the joint venture. Only Japanese engineers are able to respond quickly to technical troubles, this Japanese company said. Therefore, my survey suggests that, even Group B, an outstanding first-tier Thai supplier that is competitive in the international market, is still dependent on Japanese engineers for certain work and processes, although nearly three decades have passed since this joint venture started.

According to my survey, Japanese automakers have acted as go-betweens for joint ventures between Japanese and Thai manufacturers. For example, Mitsubishi Motors in Japan urged the above-mentioned Japanese auto parts maker, a supplier to Mitsubishi Motors in Japan, to make an investment in Thailand when Mitsubishi established a new factory in Leamchabang. Mitsubishi introduced this Japanese auto parts maker to Group B to establish a joint venture. Group B was selected as a joint venture partner because it had dealt with Mitsubishi Motors (Thailand) for a number of years and enjoyed a close relationship with it.

Okada (1983a:xxiv) classifies three stages of technology development in the machine-building industry in Asia. First, new technology is transferred to a few large-scale local manufacturers, most of which are joint ventures with foreign manufacturers or their subsidiaries. Second, this technology is then spread to small-scale local firms that subcontract for large-scale local manufacturers in the production of parts and components. In the final stage, the new technology is diffused to small-scale subcontractors and they develop into modern manufacturers of specific parts or components.

In Thailand, joint ventures between Japanese manufacturers and Sino-Thai families have contributed to the transfer of Japanese technology as the case of Group B suggests. However, it is not yet clear whether Japanese manufacturing technology is spreading to small-scale local part makers; in other words, has the Thai automobile industry entered the second stage or not? This point is an issue to be addressed in the future.

The fourth way of introducing Japanese technology is the collaboration among manufacturers based on the spirit of *monozukuri*, as described below.

#### The Spirit of *Monozukuri*

In Japan, it is common for automaker's engineers to cooperate closely in the designing, engineering and manufacturing of automobiles with suppliers' engineers in order to perfect the final products. In Japan, Japanese automakers have established close relationships with suppliers and provide technical guidance to them in order to integrate all vehicle subsystems. Collaboration between both sides makes the flawless completion of automobiles possible. This is one aspect of the spirit of *monozukuri* in Japan. In business administration, it is referred to as a business model that is based on "integral architecture."<sup>47</sup> The Japanese auto industry business circle has tried to cultivate this spirit or "integral architecture" not only in Japan but in Thailand as well, as pointed out by several Japanese businessmen who have worked for the Thai auto industry for many years.

In the case of the joint venture between Group B and a Japanese auto parts maker (mentioned in the previous section), Thai Mitsubishi first places an order with this joint company. Then, Japanese engineers, dispatched by this Japanese auto parts maker stationed at the joint company, cooperate with Thai Mitsubishi in manufacturing the products. These Japanese engineers learn how to produce the products under the guidance of Thai Mitsubishi.

This case shows that collaboration between automakers and suppliers is arranged, at the first stage, among Japanese engineers. This Japanese auto parts maker has been a supplier to Mitsubishi Motors in Japan for a long time and forged a very close relationship with it. In other words, they have established a relationship of mutual trust in Japanese business circles. Based on this

trustworthiness, they have tried to bring the Japanese way of manufacturing products or the spirit of *monozukuri* to Thailand. In this way, Japanese automakers intend to keep the Japanese style of manufacturing in Thailand.

Close collaboration is found not only between automakers and auto parts makers, but also among auto parts makers. My survey reveals that Japanese first-tier suppliers provide second-tier suppliers, whether they are Thai or Japanese, with technical guidance. Therefore, the spirit of *monozukuri* is implemented by Japanese manufacturers at even lower levels in the Thai automotive industry. According to a Japanese first-tier supplier, the technical guidance for second-tier suppliers brings about an improvement of products although, in general, Japanese second-tier suppliers show greater improvements than Thai ones. This indicates that manufacturing technology is transferred more smoothly among Japanese suppliers than from a Japanese one to a Thai one.

Another Japanese first-tier supplier explains that it has provided technical guidance to all 24 of its second-tier suppliers for about three years, and intends to maintain its relationships with the second-tier suppliers by providing technical guidance. This is based on an idea shared among Japanese automotive companies that they should develop and foster their own suppliers.<sup>48</sup>

Several Japanese engineers point out that, for Thai people, it is hard to understand the spirit of *monozukuri* because Thailand has no technological base for manufacturing. They note that Thailand is very different from Japan which has had a long history of technological development. In Japan, the spirit of *monozukuri* has penetrated deeply into even the lowest level of manufacturers such as a small town factory. A Japanese auto parts maker explains that it is necessary for Thai engineers to master Japanese technology and to be fluent in Japanese in order to understand this spirit. They add that Thai engineers should also have loyalty and devotion to their companies.

In order to alleviate a shortage of talented Thai engineers, a large-scale attempt to transfer the spirit of *monozukuri* into Thailand has already begun. The Thai-Nichi Institute of Technology (TNI) was opened in 2007, aiming to be a university of *monozukuri* in the Japanese style. The Technology Promotion Association (Thailand-Japan), which is made up of members who were Japanese alumni, played a leading role in establishing TNI. It mandates that all students must learn not only

technology, but also Japanese, reflecting the intent to raise Thai engineers who understand the spirit of *monozukuri* particularly in the automotive, electronics and IT sectors.<sup>49</sup> Japanese manufactures in Thailand expect that TNI will provide them with distinguished Thai engineers who are familiar with the spirit of *monozukuri*.

### Technological Development

As was noted in section 4, the auto parts industry in Thailand is rated high in manufacturing technology among Asian countries. It would be fair to say that the Thai auto parts industry has showed great developments in technology as a whole over the last several decades.

For instance, Group A has been successful in reaching a high level of quality and productivity. A Japanese engineer who worked for the Group evaluates its products highly in terms of quality, cost and engineering. One of its products, springs, have the exact same quality and productivity as the products of its rival Japanese manufacturer.

However, not all auto parts manufacturers have reached equally high levels of accomplishment in technology in Thailand. According to the above-mentioned Japanese engineer, capital ownership matters a great deal in the development of technology in Thailand. Wholly Thai-owned manufacturers tend to be inferior in terms of technology to wholly Japanese-owned manufacturers and to joint ventures between Thai and Japanese firms. While he notes that Group A, a wholly Thai-owned manufacturer, has made extensive improvements in technology for the last two decades, it nevertheless still lacks in applied skills. Being provided with machines and other manufacturing facilities, Thai people can produce products properly. However, when trouble arises in the production process, they cannot cope well with trouble, he adds.

Another case suggests that manufacturing technology in Thailand is still underdeveloped, although it has attained a certain level. A Japanese manufacturer of plastic auto parts, operating in Japan, concluded a technical assistance agreement with Group B more than 20 years ago. While this has improved the level of technology in the Group as a whole, it is far from its goal. As explained by an engineer of a Japanese manufacturer, assuming that its technology goal level is 10 and that 20 years ago, it was on level 1, at present, it has only attained level 3 and has the potential for level 6 or 7.

Furthermore, he notes that the Group lacks the ability to conduct research and development.

According to this Japanese engineer, the products of Group B are of the same quality as products made by the Japanese manufacturer. However, productivity in the Group is rather low, compared with the Japanese manufacturer. For example, it takes the Group twice as long as the Japanese manufacturer to mold a piece of bumper. Moreover, the in-process defect rate is far higher in the Group than in its Japanese counterpart. In this Japanese engineer's view, the Thai auto parts industry is thus still inferior in general competence to the Japanese. Thailand will continue to be a center for automobile production; however, it cannot be a center for development of automobile industry, he says.

My survey reveals that Thai auto parts manufacturers have adopted a pragmatic attitude toward technology transfer and technological development. As mentioned in section 5, both Group A and Group B have concluded technical assistance agreements with a number of Japanese manufacturers in order to introduce technology that they do not have. Their basic attitude is that they can buy the necessary technology if needed, and technical assistance agreements are the means to do that. It does not matter so much whether they develop technology by their own efforts.

Introducing technology by simply buying it might be one of the advantages that latecomers such as Thailand can enjoy. Rather than bearing the cost of research and development, this may be the most efficient way to introduce technology, since Thailand lacks well-established technology and talented engineers. However, this attitude may be contrary to the spirit of *monozukuri* to which Japanese manufacturers adhere.

This pragmatic attitude toward technology transfer is found not only in private companies but in the Thai government as well. Since the beginning of the 1960s, the starting point of Thai industrialization, the basic policy of the BOI has been that Thailand should introduce what it does not have by luring foreign investment. First of all, it encouraged foreign automakers to invest in Thailand in order to start up the new industry. The introduction of a local content requirement caused a scarcity of auto parts, and then foreign (Japanese) auto parts makers were lured to invest in Thailand (although the government's initial intent may have been to build up local supporting

industries). The expansion of the auto parts industry spurred new demand for dies and molds, for instance. However, the dies and molds industry was so immature in Thailand that BOI began to ask foreign (Japanese) mold manufacturers to invest in the country. It seems that Thailand has been consistent in its policy of bringing what it lacks from foreign countries.

Thailand may have had no choice left but to adopt this pragmatic policy because it had no technological base in manufacturing. In Thailand, the prewar period did not see any marked developments in manufacturing, with the exception of rice-milling and its related industries. It would be fair to say that the industrialization policy introduced around 1960 gave birth to modern manufacturing in Thailand. Thailand is very different from Japan which had a long history of manufacturing since the prewar period and which built up an automobile industry from scratch, largely through its own efforts.

On the other hand, the Thai government has made several attempts to raise the technological level of the automotive industry. The Automotive Human Resource Development Project (AHRDP) is a project to advance the cultivation of human resources in cooperation with four outstanding Japanese automotive companies (Toyota, Honda, Nissan and Denso). This project, which began in 2005, was intended to develop the human resources of Thai second-tier and third-tier suppliers through the teaching of Japanese technology and know-how.

In this project, engineers (referred to as master trainers) visit Thai second-tier and third-tier suppliers, including joint ventures with Japanese capital, and provide technical guidance to each supplier for half a year. It plans to make improvements or *kaizen* in 1,800 suppliers over the next ten years. According to Toyota, which is responsible for improving the production system in this project, it has been successful in achieving considerable *kaizen* in many respects such as an increase in productivity and reduction of inventory. Honda is in charge of the technology of jigs and molds, Nissan in the certification in engineering technology, and Denso in manufacturing technology.<sup>50</sup>

#### Political Connections

In Thailand, it is not uncommon to find that successful businessmen or their family members show an interest in national politics. Dr. Y's family (Group B) is no exception. Mr. Z, who established

himself as one of the influential politicians in the Thai Rak Thai Party, is Dr. Y's younger brother. Mr. Z, born in 1954, studied in the U.S. and received a Bachelor of Science in manufacturing engineering. After working for automobile companies run by an elder brother, Mr. Z entered the world of national politics and in 1998, joined the Cabinet as Deputy Minister of Industry in the Chuan Government. He also served as Industry Minister, Transport Minister, and Deputy Prime Minister in the Thaksin Government (2001–06).<sup>51</sup> As Secretary-General of the Thai Rak Thai Party, he is reported to be one of the Party's big sponsors.

It is difficult to prove exactly how Mr. Z, an outstanding politician, exerted his political influence in order to give Group B business advantages. While the widow of Dr. Y has denied that the Group has enjoyed a special favor of the government thanks to Mr. Z, there are some who doubt that Dr. Y would not make full use of privileged connections with the political world.

As an example, Group B established a new factory in 1977 in the Bangna-Trad area (located in the outskirts of Bangkok). The Group has expanded its businesses in this area since then, and the central base of its businesses is still located there. This area is close to and within very easy access of Suvarnabhumi Airport, a new international airport that opened in 2006. The expropriation of land to build this airport began as early as in the 1950s and the master plan of this airport was begun in 1972.<sup>52</sup> Therefore, when the Group moved to Bangna-Trad, the plan for the new airport had already been arranged although it probably did not receive wide publicity yet in the 1970s. It was in 1996 that the plan for the new airport began on a full scale.<sup>53</sup> We cannot exclude the possibility that Dr. Y extracted some information about a new airport through a political connection before the 1990s. If he was a politically oriented person, it is plausible that he tried to build mutually advantageous connections with politicians even before his brother became a politician.

Group B announced the plan to develop a number of projects to build hotels and office buildings near Suvarnabhumi Airport soon after the airport began operations. This suggests that the Group may have purchased a large area of land near Suvarnabhumi Airport well ahead of its opening, expecting that the land price would jump. Furthermore, in the Thaksin Government, Mr. Z served as the Transport Minister who had supervision over the Suvarnabhumi Airport project.

According to an Executive Vice President of a joint venture between Group B and a Japanese company, he received the impression that the BOI gave his company special treatment when it applied to BOI for investment promotion. My interviews with other concerned parties of the Group did not reveal that the Group canvassed for policies favorable to the automotive industry through privileged connections with politicians. However, it is noteworthy that the family that is operating the most outstanding local auto parts company is also a highly politically minded one.

#### Government Policies in the Auto Parts Industry and Sino-Thai Entrepreneurs

The Thai government has employed a number of policies to protect and promote the auto parts industry for several decades, as described earlier. They were introduced at first on the lines of an import substitution policy. This section analyzes how these policies have influenced the formation of Sino-Thai entrepreneurs in the industry.

The most influential policy in the growth of local Chinese businessmen was the imposition of local content requirements. In other words, those who benefited handsomely from the requirements were Sino-Thai businessmen who had had some experience in manufacturing motorcycle or auto REM parts and had accumulated some capital. Both founders of Group A and Group B had already begun their careers in motorcycle or auto REM parts manufacturing when local content requirements were applied in the 1970s. Nevertheless, the requirements formed crucial turning points for both, and they started production of OEM parts and made a breakthrough after the introduction of local content requirements.

It should be emphasized that the import substitution policy, which was intended to protect and build domestic industry, extended a special favor to some Sino-Thai entrepreneurs who had experience in manufacturing REM parts. According to my survey, they needed to employ advanced technology in order to meet the technical standards of OEM parts. They had to import Japanese machines, employ Japanese engineers, or conclude technical assistant agreements with Japanese manufacturers when they began production of OEM parts. This means that only those who were able to afford the expense entered into manufacturing OEM parts. As has been already described, because Thailand did not have a firm base for the development of manufacturing technology, those who intended to start manufacturing OEM parts needed some capital to introduce modern technology.

A further investigation is necessary to conclude that the import substitution policy toward the auto industry brought great benefits to only certain Sino-Thai entrepreneurs. However, my survey of two influential first-tier manufacturers suggests that the government policy was biased in favor of them.

## 7. Summary

This survey highlights how Thai entrepreneurs have grown in the auto parts industry in which Japanese FDI has contributed markedly. Their leading characteristics are analyzed mainly based on interviews with two outstanding first-tier suppliers to Japanese automakers.

My interviewees were Sino-Thai entrepreneurs who established their businesses from scratch. Their businesses of manufacturing auto parts have their origins in the repair industry in which they were involved in during their childhood. Their businesses made remarkable progress in the 1970s when local content requirements were introduced for motorcycle and automobile production. They took advantage of the opportunity and expanded their businesses, entering into the manufacturing of OEM parts. Local content requirements brought great benefits to these Sino-Thai entrepreneurs who were able to afford the investment. Furthermore, it would be important to note that one of my interviewees came of a politically minded family.

They have been dependent on Japanese manufactures in terms of technology. This is partly because they received no or little formal education and did not have the knowledge needed with regard to modern technology in the manufacture of OEM parts. In order to overcome this challenge, they adopted several strategies to introduce Japanese technology, such as concluding technical assistance agreements with Japanese manufacturers and formation of joint ventures.

Thailand entered into industrialization around 1960 without a reliable base of manufacturing technology that was necessary for industrial development. My interviewees' careers show this clearly. The lack of manufacturing technology resulted in the dominance of Japanese technology in the auto industry.

The technology transfer from Japan to Thailand has made good progress. It seems that Japanese manufacturers have adhered to the Japanese way of producing products following the spirit of

*monozukuri* when they transfer Japanese technology to Thailand. The close collaboration between car makers and suppliers is typical of this. In general, the Thai auto industry has made steady progress in manufacturing technology over the past several decades. However, the technology transfer from Japan is far from complete, and several attempts to smooth away obstacles are being put into practice in cooperation with the Japanese business circle.

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January 10, 2008. Senior Vice President, Group A.

June 16, 2008. Executive Vice President of a joint venture between a Japanese auto parts company and Group B.

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\* This survey was conducted under a grant from the Graduate School of Doshisha University (The Subsidy for the Promotion of Graduate School 2007 and 2008). The author would like to thank Mr. Chitaworn Worasak, former Deputy Secretary General of BOI. His support is gratefully acknowledged.

<sup>1</sup> Thailand (1960–97) was one of thirteen countries selected by the Commission on Growth and Development (2008) that had grown by at least 7% for at least 25 years since 1950. World Bank data show that Thailand’s annual economic growth rate was 7.3% (1965–80), 7.6% (1980–90), 4.2% (1990–00) and 5.4% (2000–06) (World Bank 1992, 2002, 2008). However, the country experienced a year of negative economic growth immediately after the economic crisis in 1997. NESDB (2009) forecasts that the economy will contract from -3.5 to -3.0 percent for 2009.

<sup>2</sup> Japan has been the largest investor FDI in Thailand. FDI from Japan has constituted about 40 percent of the total FDI in terms of value since 1985, and Japanese FDI is concentrated in the automobile and electronic industries. Based on data contributed by BOI, July 2008.

<sup>3</sup> Based on data contributed by BOI, July 2008.

<sup>4</sup> The government eased restrictions on foreign ownership in ventures after the 1997 economic crisis when many local companies experienced financial difficulty. As a result, a large amount of foreign capital, most of which is believed to be Japanese, was injected into auto assemblers and auto parts companies (Sakkarin 2008:69–74). Presently, the Japanese own a majority of stock in all of the Japanese car assemblers (Table 3).

<sup>5</sup> It is predicted that automobile production in Thailand will drop sharply in 2009 because of the worldwide recession. Thailand produced only about 0.389 million automobiles in the first six months of 2009 (TAI 2009).

<sup>6</sup> Mr. Satit Chanjavanakul, Secretary General of BOI, raised four points to fulfill the aim of Thailand becoming the “Detroit of the East”: (i) becoming the production base of one-ton pickup trucks in the world; (ii) becoming a major production base of motorcycles; (iii) becoming the production base of OEM (Original Equipment Manufacturing) parts and REM (Replacement Equipment Manufacturing) parts; and (iv) increasing automobile production to 1.8 million units by 2010. Based on data contributed by BOI, April 2006.

<sup>7</sup> Based on data contributed by BOI, April 2006.

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<sup>8</sup> Based on data contributed by BOI, April 2006. In addition, *WSJA* (December 29, 2008) reported that Thailand's automotive sector employs about 300,000 people.

<sup>9</sup> Based on data contributed by Toyota Motor Thailand, July 2008.

<sup>10</sup> Thailand started the export of automobiles in 1987. (Kriengkrai and Thammavit 2004a:49)

<sup>11</sup> Based on an interview with Director of the Thailand Automotive Institute, April 2006. Fourteen companies are automotive assemblers and one company (Thairung Union Car) produces remodeled cars. Details about the other two companies are unknown.

<sup>12</sup> These 30,000 auto parts vary greatly from large parts such as seats, radiators and tires to small parts such as bolts and nuts (JSAE 2008:3).

<sup>13</sup> "Technology" is defined as "the combination of product design, production technology and production management" (Okada 1983a:note 1).

<sup>14</sup> For example, Mahathir bin Mohamad, former Prime Minister of Malaysia, launched a national car project called the Proton in the 1980s, while in Indonesia, the Timor national car project was started in the 1990s by former President Suharto. Both leaders had a long-cherished aspiration for development via the auto industry.

<sup>15</sup> Drucker (1946:176) notes that "the automobile industry stands for modern industry all over the globe. It is to the twentieth century what the Lancashire cotton mills were to the early nineteenth century: the industry of industries." Bloomfield (1978:11) also states that the automotive industry "is one of the important symbols of the twentieth century."

<sup>16</sup> The years in parentheses correspond to the period in Thailand.

<sup>17</sup> The BOI selected 123 industries to be promoted, and these industries were classified into three groups according to their importance for the national economy. Group A was considered to be the most essential to the Thai economy. Group B was important, but to a lesser degree than Group A. Group C was defined as being less essential than Group B to the national economy (Suehiro 1989:180–81).

<sup>18</sup> Japanese cars make up an extremely large share in the Thai domestic market. In the world market as a whole, Asian cars (for example, Toyota, Nissan, Honda, Hyundai, etc.) have only a 43 percent share (*WSJA* March 23, 2006).

<sup>19</sup> According to Kriengkrai and Thammavit (2004a:32), the Thai government had no clear policy to promote supporting industries in the early stages of industrialization.

<sup>20</sup> For example, leading Japanese auto parts supplier Denso, an affiliate of Toyota, established

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Nippon Denso Thailand Co., Ltd. in 1972.

<sup>21</sup> On the other hand, automobile assembly plants were no longer given investment promotion incentives.

<sup>22</sup> The ATI was established in 1967 and was the predecessor of the present Federation of Thai Industries (FTI). FTI was organized in 1987.

<sup>23</sup> Local content requirements were abolished because it was thought to violate the TRIMs Agreement (Agreement on Trade-Related Investment Measures) of the World Trade Organization (WTO), an organization in which Thailand has been a member since the WTO's inception in 1995.

<sup>24</sup> The Japanese Chamber of Commerce expressed opposition to a further increase in the local content requirements in a report published in 1982 (Patcharee 1985:179). The Chamber's automobile club insisted on freezing the 45 percent local content because the cost penalty for local parts was so high that automobile production costs and prices would rise.

<sup>25</sup> In 1989, MOI announced that it would restrict passenger car series assembled, to 42. Furthermore, only two models were allowed for each series.

<sup>26</sup> The import ban on cbu passenger cars larger than 2300cc. was removed in 1985.

<sup>27</sup> According to Kriengkrai and Thammavit (2004a:50, 52), this ban accelerated liberalization in the auto industry and many automobile assemblers and suppliers began to adopt this strategy to position Thailand as their manufacturing and export base.

<sup>28</sup> However, the tariff on OEM components and parts was raised from 20 to 33 percent simultaneously with the abolition of local content requirement in 2000. The government intended to protect local parts suppliers from foreign competition (Kriengkrai and Thammavit 2004a:53, Table7)

<sup>29</sup> According to Patcharee(1985:146), in 1977, the number of auto parts manufacturers was estimated at 180. In 1995, there were about 350–400 auto parts manufacturers in Thailand. The number of auto parts manufacturers has been estimated to have increased sharply thereafter.

<sup>30</sup> Local manufacturers refer to manufacturers that operate in Thailand, but include both Thai and foreign manufacturers. Most foreign manufacturers are Japanese. Many joint ventures between Japanese companies and Thai ones are also included.

<sup>31</sup> The percentages are based on data contributed by the BOI, July 2008. However, estimates of the *real* share are only about 50–60 percent (JETRO Bangkok Center 2006:19). This is because

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materials such as steel are imported. In the case of Toyota, the share of parts produced by local manufacturers reached 90 percent for both pickup trucks and passenger cars. All parts, except for transmissions which must be imported from Japan, are made in Thailand. However, the *real* share is less than 50 percent (based on data contributed by Toyota Motor Thailand, July 2008).

<sup>32</sup> Based on data contributed by Toyota Motor Thailand, July 2008.

<sup>33</sup> Competitiveness is evaluated on five factors, namely, quality, cost, delivery, engineering and production system (JETRO Bangkok Center 2006:3).

<sup>34</sup> *Nangsu cek* are books or booklets in memory of a deceased person and that are distributed at funerals.

<sup>35</sup> The Teochius command a majority of the Chinese population in Thailand, while the Hainanese form a smaller Chinese speech group. Skinner (1957:136) describes the Hainanese as being among the poorest among Chinese speech groups in Thailand and of low social standing.

<sup>36</sup> According to a survey in the 1950s, machine-shop proprietor is one of the occupations in which the Hainanese specialized (Skinner 1957:317). Therefore, his Chinese speech group may have influenced him to decide to work in auto repair services.

<sup>37</sup> For the details of TAPMA, see section 4. It had 645 members as of July 2009.

<sup>38</sup> Japanese capital constitutes 98 percent of foreign capital in Group B.

<sup>39</sup> Kriengkrai and T. Terdudomtham. (2004b: 174-176) analyzes how Group B has developed technological capability through the inter-firm relationship with Mitsubishi Motors (Thailand).

<sup>40</sup> For details, see section 4.

<sup>41</sup> Based on data contributed by Department of Business Development, MOC, September 2007.

<sup>42</sup> Among Japanese automobile assemblers, only Toyota was allowed to start its business in Thailand without any Thai ownership (Sakkarin 2006:263, note 51).

<sup>43</sup> Domestic demand is calculated as domestic production plus import minus export.

<sup>44</sup> In Korea, the outbreak of the Korean War in 1950 caused a sharp increase in military demand for car-repairing and maintenance services. As a result, the automobile parts and components industry was developed from the skills accumulated during the war before modern automobile assembling was started in 1962 in Korea (Kim and Lee 1983). However, in the case of Thailand, military demand for repair and replacement did not seem to have any significant influence on upgrading of machine-building technology.

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<sup>45</sup> The case of Thailand is in a striking contrast to that of Malaysia which started its national car project and set up its own brand, Proton.

<sup>46</sup> On a scale of one to ten (ten being the most difficult of auto parts to manufacture), this Japanese auto parts maker rates their products at a difficulty level of 6–7.

<sup>47</sup> Fine (2005) and Fujimoto (2004) analyze two business models of manufacturing: one based on “integral architecture” and the other on “modular architecture.” Japanese automakers have developed the business model in an “integral” way as epitomized by Toyota.

<sup>48</sup> According to a Japanese engineer working in Thailand, Toyota has followed this principle more strongly than other Japanese car makers.

<sup>49</sup> Some students obtain scholarships that are donated by Japanese companies.

<sup>50</sup> Based on data contributed by Toyota Motor Thailand, July 2008.

<sup>51</sup> Mr. Z was an executive member of the Thai Rak Thai Party, which was banned from political activities for five years when the Party was ordered disbanded by the Constitution Tribunal in 2007. In 2009, he was reported to have attended a ceremony organized by the Bhum Jai Thai Party, which emerged as the second-largest ruling party in the Democrat-led government.

<sup>52</sup> Based on data contributed by Airport of Thailand Public Co. Ltd., April 2006.

<sup>53</sup> Airport of Thailand Public Co. Ltd., which is in charge of the airport operations, was established in that year.

**Table 1. Automobile production: top 15 countries, 2007 (units)**

<b>Country</b>	<b>Passenger Cars</b>	<b>Trucks &amp; Buses</b>	<b>Total</b>
Japan	9,944,637	1,651,690	11,596,327
United States	3,924,268	6,856,461	10,780,729
China	6,381,116	2,501,340	8,882,456
Germany	5,709,139	504,321	6,213,460
South Korea	3,723,482	362,826	4,086,308
France	2,554,000	465,144	3,019,144
Brazil	2,388,402	582,416	2,970,818
Spain	2,195,780	693,923	2,889,703
Canada	1,342,133	1,236,105	2,578,238
India	1,707,839	598,929	2,306,768
Mexico	1,209,097	886,148	2,095,245
United Kingdom	1,534,567	215,686	1,750,253
Russia	1,288,652	371,468	1,660,120
Italy	910,860	373,452	1,284,312
Thailand	308,500	929,960	1,238,460

Source: JAMA (2008).

**Table 2. Labor productivity, 2004**

<b>Sector</b>	<b>Labor productivity (value added per worker, in baht)</b>
All industries	184,145 <sup>a</sup>
Manufacturing	453,328
Automobile industry <sup>b</sup>	3,586,909

Notes: a. GDP/employed labor force.

b. Includes the auto parts industry.

Source: Author's calculations using ADB(2008) data.

**Table 3. Automotive assemblers in Thailand**

<b>Brand</b>	<b>Company</b>	<b>Start of production (year)</b>	<b>Ownership (2006)</b>
<b><u>Japanese</u></b>			
Nissan	Siam Nissan Automobile <sup>a</sup>	1962	Nissan 75%, Thai 25%
Toyota	Toyota Motor Thailand	1964	Toyota 86.4%, Thai 13.6%
Hino	Hino Motors Manufacturing (Thailand)	1964	Hino 80%, Mitsui & Co., Ltd. 20%
Mitsubishi	Mitsubishi Motors (Thailand)	1966	Mitsubishi 99.8%, Thai 0.2%
Isuzu	Isuzu Motors (Thailand)	1966	Isuzu Asia (Singapore) 64.6%, Isuzu 6.7%, Thai 28.6%
Honda	Honda Automobile (Thailand)	1984	Honda 91.3%, Thai 8.6%
<b><u>Japanese-American</u></b>			
Mazda & Ford	Auto Alliance (Thailand)	1998 <sup>b</sup>	Mazda 45%, Ford 45%, Thai 10%
<b><u>American</u></b>			
GM	General Motors (Thailand)	2000	GM 100%
<b><u>European</u></b>			
Volvo	Thai-Swedish Assembly	1976	Volvo 100%
BMW	BMW Manufacturing (Thailand)	2000	BMW Holding B.V. 100%
<b><u>Indian</u></b>			
Tata	Tata Motors (Thailand)	2007	Tata Motors 70%, Thonburi Automobile Assembly Plant 30%
<b><u>Thai</u></b>			
Mercedes-Benz	Thonburi Automotive Assembly Plant	1963	na
-----	Thairung Union Car	1967	Thai 86.4%, Foreign 13.6%
Opel, Daihatsu, Honda	Bangchan General Assembly	1970	Thai 100%
Peugeot, Citroen, VW	Y.M.C. Assembly (Yontrakit Motors)	1972	Thai 100%

(Continued on next page)

**Table 3. Automotive assemblers in Thailand (continued)**

Notes: na Not available.

- a. The company name changed to Nissan Motor (Thailand) in April 2009.
- b. Mazda established the first assembling plant in Thailand (Sukosol Mazda Auto Assembly Co., Ltd.) in 1975. Mazda and Ford built Auto Alliance (Thailand) Co., Ltd. as a joint venture in 1995, and this company started pickup truck assembling in 1998.

Sources: Sakkarin (2008), Siriboon (1983), Suehiro (1989), Ueda (2007), homepage of each company, and data from Department of Business Development, Ministry of Commerce.

**Table 4. Production share, 2007**

	<b>Share (%)</b>
Toyota	39.5
GM/Isuzu	24.0
Mitsubishi	12.5
Honda	10.4
Ford/Mazda	9.8
Nissan	2.5
Others	1.4

Source: TAI (2009).

**Table 5. Market share, 2007**

	<b>Share (%)</b>
Toyota	44.5
Isuzu	27.4
Honda	9.2
Nissan	6.0
Ford/Mazda	4.8
Mitsubishi	4.4
Others	3.6

Source: TAI (2009).

**Table 6. Export share, 2007**

	<b>Share (%)</b>
Toyota	34.5
Mitsubishi	21.2
Ford/Mazda	16.7
GM/Isuzu	12.8
Honda	11.6
Nissan	3.2
Others	0.1

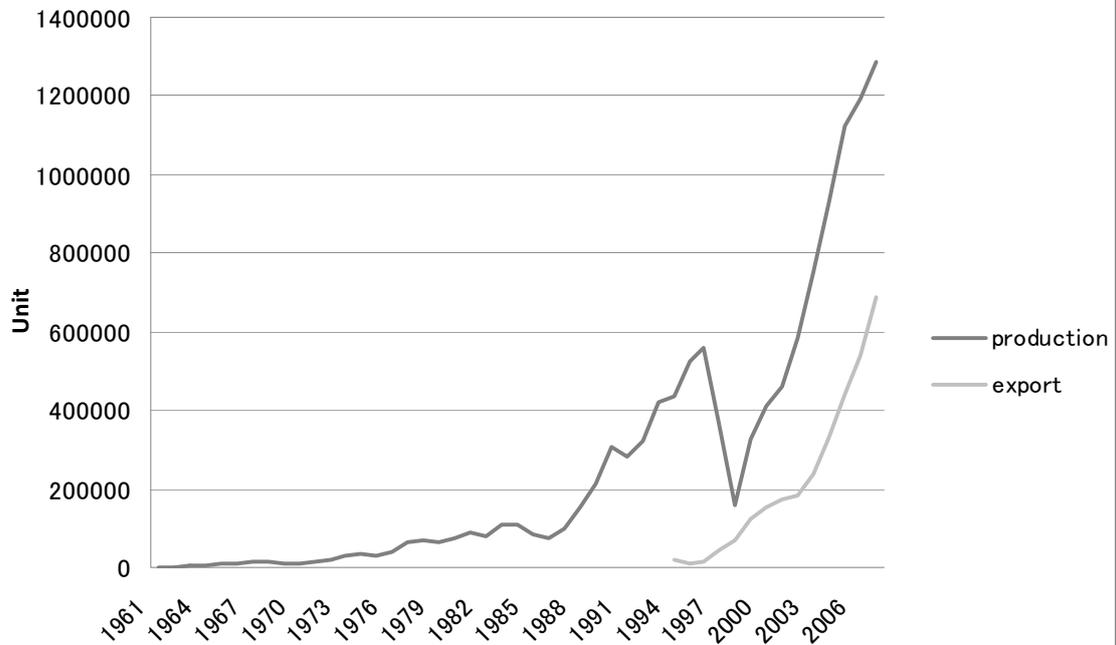
Source: TAI (2009).

**Table 7. The number of automotive suppliers and automobile production in Thailand, Indonesia, Malaysia and the Philippines**

	<b>Tier 1</b>	<b>Tier 2 &amp; Tier 3</b>	<b>Total</b>	<b>Automobile production in 2007 (units)</b>
Thailand	about 700 (more than 50% are foreign)	1,100 (most are local)	about 1,800	1,238,460
Indonesia	about 130 (about 70% are foreign)	more than 180 (more than 70% are local)	more than 310	419,040
Malaysia			350–500	413,440
Philippines	124	132	256	42,000

Sources: JAMA (2008), JETRO Bangkok Center (2006:22–27).

**Fig.1 Vehicle production and export: 1961-2007**



Source.—Production 1961–1992, Noppadol (1995, 32). Production 1993–2007, TAI (2009).  
Export, TAI (2009)

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