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Current Status and Traits of the Auto Parts Industry in Viet Nam

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This study aims to clarify the current situation and traits of the Vietnamese automobile industry by showing the status of its automobile and auto parts industry. The whole picture of the automobile industry in Viet Nam is discussed first, and then the vulnerability of the auto parts industry, which is the biggest feature and an issue to be addressed in the future, is highlighted as it is the auto parts industry that ultimately determines the competitiveness of the auto industry.

The study looked at studies that have been undertaken on this subject. The number of analytical studies dedicated to the auto industry in Viet Nam is extremely small. Besides, most of them have been conducted only in the context of the Association of Southeast Asian Nations (ASEAN) automobile industry in general. Studies by Tetsuya Kobayashi (2013) and Yingshan Jin (2016) are among them. These studies are basically intended to provide the actual picture of the automobile industry in Viet Nam. This research paper will focus on the auto parts industry in Viet Nam with the aim of getting closer to its core. It should be noted that many of auto parts suppliers in Viet Nam have started operations as motorcycle parts suppliers, and some of them have transformed from motorcycle to auto parts suppliers.

Section 1 describes the establishment of the motorcycle industry in Viet Nam and the formation and expansion of the motorcycle parts industry. Section 2 describes the start of automobile production and the peculiarity of the supply chain formation. Section 3 discusses the possibility of converting from motorcycle parts suppliers to auto parts suppliers. During this process, the global value chain advocated by Gary Gereffi and Miguel Korzeniewicz (1994) is considered to see if and how it will apply and evolve in Viet Nam.

Keywords: Viet Nam; motorcycle and auto parts; mixed production system of 2-wheeled and 4-wheeled vehicles; TOYOTA MOTOR VIETNAM CO., LTD.; Truong Hai Auto Corporation Group (THACO).
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1. Establishment of the Vietnamese Motorcycle Industry and the Formation and Expansion of its Parts Industry

1.1 Transition of the Motorcycle Industry and its Parts Industry in Viet Nam

This paper relies on the studies conducted by Ueda (2003), Fujita (2006), and Mishima (2010) on the development of the motorcycle industry in Viet Nam. The motorcycle industry in Viet Nam started in the 1990s as a late comer in comparison with other Association of Southeast Asian Nations (ASEAN) countries like Thailand.

Mishima (2010) classified the motorcycle industry in Viet Nam into three periods. Period I, which is the dawning era, is from *Doi Moi* (Vietnamese for renovation) in 1986 through 1999, during which time in 1995, Viet Nam participated in ASEAN. During this period, Vietnam Manufacturing and Export Processing Ltd. (VMEP) entered from Taiwan to produce its SYM (Sanyang Motor) brand; foreign motorcycle makers made inroads into Viet Nam — Japanese Suzuki (1995), Honda (1996), and Yamaha (1998); foreign manufacturers began comprehensive production; and local makers started local assembly from imported complete knock-down (CKD) parts. Period II is from 2000 to 2002. During this period, the Chinese market share surged due to a rapid increase in the import of low-priced motorcycle parts. The market expanded explosively from the 5 million level to a staggering 15 million level. Led by Honda that launched a low-priced Southeast Asian version model, Japanese makers were desperate to recover the market. Period III is after 2003 up to the present. During this period, Japanese and Taiwanese motorcycle makers tried to improve productivity while increasing the local content ratio. At the same time, Honda started to export motorcycles from Viet Nam to the Philippines and other countries. During the development of the motorcycle industry, the motorcycle parts suppliers strengthened

their presence and capabilities as well. The Japanese-affiliated parts suppliers also made inroads into the Vietnamese market.

Table 1 below shows the number of motorcycle and auto parts suppliers that were founded in Viet Nam during Periods I, II, and III.

Table 1: Number of Motorcycle and Auto Parts Suppliers by Period of Establishment

Period	Local	Foreign	Japanese	Total
I (1986–1999)	30	2	1	**33**
II (2000–2002)	11	6	5	**22**
III (2003–present)	50	66	46	**162**
Total	**91**	**74**	**52**	**217**

Note: Excludes companies with data unknown (one local and six foreign companies).

Source: Japan External Trade Organization (2015a; 2015b); Japan International Cooperation Agency (2015).

Table 1 shows 33 parts suppliers (15.2%) in Period I (1986–1999); 22 parts suppliers (10.1%) in Period II (2000–2002); and 162 parts suppliers (74.7%) in Period III (2003–present). During Period III, local, foreign, and Japanese companies in total increased. There were 50 local firms (54.9%); 66 foreign firms (89.2%) except Japanese firms; and 46 Japanese firms (88.5%), which rushed to set up their bases in Viet Nam. During period III, Japanese and Taiwanese motorcycle makers increased their local content ratios, increased local production in Viet Nam, and launched exports to ASEAN countries. As a result, parts suppliers were encouraged to upgrade their capabilities in both quantity and quality.

1.2 Characteristics of Motorcycle and Auto Parts Industries in Viet Nam

This section will discuss the characteristics of the capital scale and employees of local, foreign, and Japanese firms.

In terms of the capital scale of the 79 local firms, except those with no reliable data available, Table 2 shows 29 large companies with capital of more than 30.1 billion VND; 9 medium-sized companies with capital of 20.1 billion VND – 30 billion VND; and 41 small companies with capital of under 20 billion VND. If Viet Nam is geographically divided into three regions — the north (Hanoi and Haiphong), central (Da Nang), and south (Ho Chi Minh City) — 60 companies or 75.9% of the total companies are assembled in the north.

Table 2: Number of Motorcycle and Auto Parts Suppliers by Capital Ccale and Region in Viet Nam

	Large	**Medium**	**Small**	Total
North	22	8	30	60
Central	-	-	1	1
South	7	1	10	18
Total	**29**	**9**	**41**	**79**

Note: Excludes 13 companies with data unknown

Source: Japan International Cooperation Agency (2015).

In terms of the number of employees, 9 large companies employ more than 1,001 employees; 19 medium-sized companies employ 201–1,000 employees; and 59 small companies employ 10 ≤ 200 employees (Table 3).

Table 3: Number of Motorcycle and Auto Parts Suppliers by Number of Employees and Region in Viet Nam

	Large	**Medium**	**Small**	Total
North	7	12	44	63
Central	1	-	-	1
South	1	7	15	23
Total	**9**	**19**	**59**	**87**

Note: Excludes 5 companies with data unknown.

Source: Japan International Cooperation Agency (2015).

In terms of the scale of capital and the number of employees, many local firms are small, but there are around 10 top companies that are exceptionally big in scale.

Most of the foreign-based companies are located in the northern part of Viet Nam. Their geographical concentration in the north allows us to grasp the whole picture. Table 4 shows the nationalities of these companies.

Table 4: Foreign-based Companies by Country

Taiwan	44
Korea, Republic of	11
Malaysia	9
Thailand	3
China	3
Singapore	3
India	2
Netherlands	1
France	1
Israel	1
United Kingdom	1
Australia	1
Total	**80**

Source: Japan External Trade Organization (2015c).

Out of 80 foreign-based companies, 44 or 50.5% are Taiwan-based motorcycle parts makers. Many of these companies have entered Viet Nam to supply parts to VMEP. Taiwan is followed by the Republic of Korea (henceforth Korea), Malaysia, Thailand, and China. There are only five non-Asian companies.

In terms of capital size and nationality, Table 5 shows the breakdown of the 76 firms (excluding four firms that had no available data).

Table 5: Foreign Motorcycle and Auto Parts Makers by Capital Size and Nationality

	Large	Medium	Small	Total
Taiwan	39	2	2	**43**
Korea, Republic of	7	-	3	**10**
Malaysia	6	2	1	**9**
Thailand	3	-	-	**3**
China	1	-	1	**2**
Singapore	3	-	-	**3**
India	1	-	1	**2**
Other	4	-	-	**4**
Total	**64**	**4**	**8**	**76**

Note: Excludes 4 unknown companies.

Source: Japan External Trade Organization (2015c).

Table 5 shows 64 (84.2%) large-sized companies; 4 (5.3%) medium-sized companies; and 8 (10.5%) small-sized companies in Viet Nam. These figures show that companies entering the Vietnamese market have big capital.

In terms of employee size and nationality, Table 6 shows the breakdown of the 78 firms (excluding two firms that had no data available).

Table 6: Foreign Motorcycle and Auto Parts Makers by Employee Size and Nationality

	Large	Medium	Small	Total
Taiwan	4	22	16	**42**
Korea,	-	3	8	**11**
Malaysia	1	1	7	**9**
Thailand	-	2	1	**3**
China	-	-	3	**3**
Singapore	-	3	-	**3**
India	-	-	2	**2**
Other	-	1	4	**5**
Total	**5**	**32**	**41**	**78**

Note: Excludes two companies with the data unknown.

Source: Japan External Trade Organization (2015c).

Table 6 shows 5 large-sized suppliers; 32 medium-sized suppliers; and 41 small-sized suppliers. Large-sized companies account for only 7.7% of the total foreign-based companies. The remaining companies (over 90%) are small- and medium-sized enterprises (SMEs). When capital size and employee size are combined, it appears that a lot of foreign-based companies do not have many employees but possess large-scale equipment.

In terms of Japan-based companies, Table 7 shows the breakdown of the 51 companies, except for one company with no available data.

Table 7: Japanese Motorcycle and Auto Parts Makers by Capital Size

	Large	Medium	Small	Total
Numbers	35	3	13	**51**

Note: Excludes 1 company with data unknown.

Source: Japan External Trade Organization (2015a).

Table 7 shows 35 (68.6%) large-sized Japanese companies; 3 (5.9%) medium-sized Japanese companies; and 13 (25.5%) small-sized Japanese companies.

In terms of employee size, Table 8 shows the breakdown of the 52 Japan-based auto parts companies.

Table 8: Number of Japan-Based Motorcycle and Auto Parts Makers By Employee Size

	Large	Medium	Small	Micro	**Total**
Numbers	5	17	25	5	**52**

Source: Japan External Trade Organization (2015a).

Table 8 shows 5 large-sized Japan-based companies; 17 medium-sized Japan-based companies; 25 small-sized Japan-based companies; and 5 micro-sized Japan-based companies with fewer than five employees. The 30 small and micro-sized companies account for 57.7% of the total Japan-based auto parts makers. Japanese companies, like other foreign companies, have big capital but small employees. It is evident that many of them are equipment-oriented.

In terms of the distribution of product lines, motorcycle production is similar to the production of four-wheel vehicles. It needs suppliers that are engaged in stamping, plastic processing, casting, forging, and machine processing to manufacture bodies, steering devices, suspensions, axles, transmissions, and harnesses. Table 9 shows the breakdown of these suppliers in Viet Nam.

Table 9: Breakdown by Product Category

	Local	Foreign	Japanese	Total
Stamping	7	5	1	**13**
Plastic	8	10	5	**23**
Forging	2	7	0	**9**
Casting	7	5	0	**12**
Machine processing	20	4	3	**27**
Precision processing	7	0	7	**14**
Total	**51**	**31**	**16**	**98**

Sources: Japan External Trade Organization (2015a, 2015b, 2015c); Japan International Cooperation Agency (2015).

Table 9 shows the breakdown of the 98 companies by product category (stamping, plastic, forging casting, machine processing, and precision processing) and nationality (local, foreign, and Japanese) as of December 2015.

In the case of local companies, 44 Tier 2 suppliers engaged in stamping, plastic, forging, casting and machine processing operations supply their components to seven Tier 1 precision machine processing companies that supply parts to motorcycle assembly plants. A small number of Tier 1 companies are served hierarchically by a large number of Tier 2 suppliers. The coexistence between a small number of top-class big companies and an overwhelmingly large number of SMEs is clearly visible in this framework.

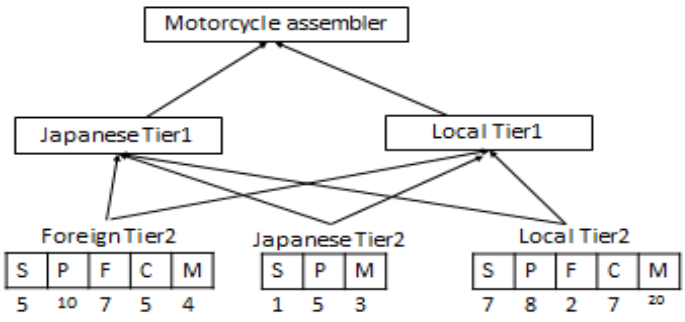
In contrast to local companies, there are seven suppliers engaged in precision machine processing, the highest number among the product segments. Moreover, each supplier of stamping, plastic, and machine processing possesses a high level of technology and is playing the role of a Tier 1.5 supplier.

Tier 1 company is supplying components directly to the original equipment manufacturer (OEM) and Tier 2 company is supplying components to a Tier 1 company.

Foreign-based companies entering the Vietnamese market are mostly focused on the plastic segment. They differs from Japanese firms in terms of the lack of being engaged in precision processing. This means that foreign companies are functioning as Tier 2 suppliers of parts to local or Japanese precision machine processing companies.

Figure 1 shows the supply scheme of the motorcycle parts industry in Viet Nam.

Figure 1: Supply Chain



Note: S-Stamping; P-Plastic; F-Forging; C-Casting; M-Machine processing.
Source: Based on Table 9.

The structure in Figure 1 is markedly different from the pyramid-type industrial formation adopted by Japan and Thailand. There are many assemblers and Tier 2 suppliers but not many Tier 1 suppliers. There is an overwhelming number of Tier 2 suppliers among foreign (except Japanese) and local companies. Nearly half of the Japanese companies belong to Tier 1. To become a Tier 1 company, one must have excellent equipment and product calibrating capabilities. Therefore, possessing the

necessary measurement equipment and measuring capability are requisites. Such qualified companies, except for Japanese and a very small number of Taiwanese companies, are extremely few among local firms.

A second feature of the parts industry structure in Viet Nam is that there are few companies capable of comprehensive production. While it is usual for Japanese companies to perform comprehensively from raw materials through machine processing and surface treatment, this comprehensive operation is disrupted between raw materials and processing in the parts industry in Viet Nam. Too many material firms minutely segregated under Tier 1 are flourishing.

2. The Peculiarity of Automobile Production and Supply Chain in Viet Nam

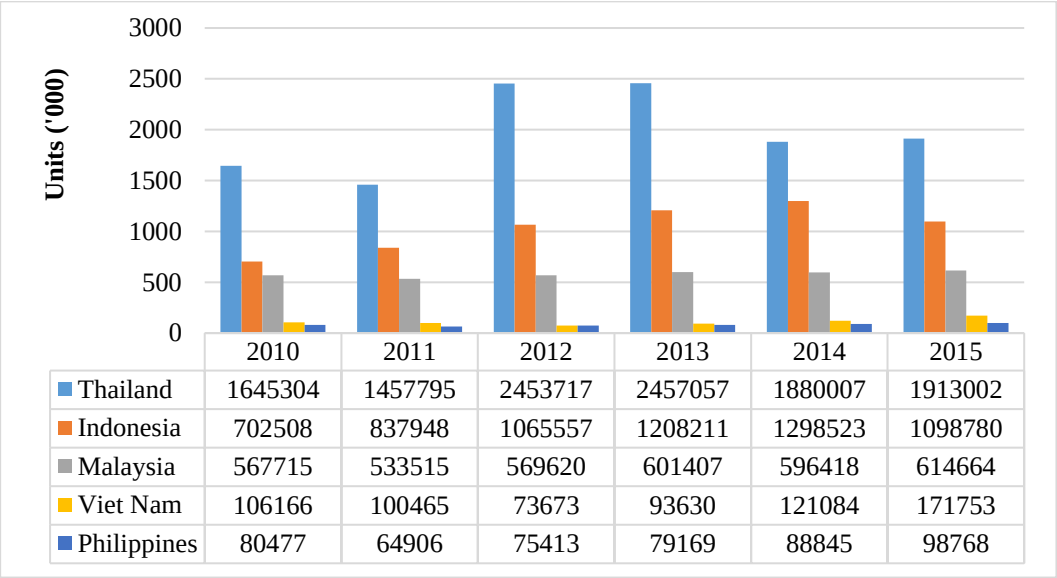
2.1. Automobile Production and Parts Supply in Viet Nam

Automobile production in Viet Nam started in the 1990s in the same way as motorcycle production. The following companies commenced their production: Mazda, Kia, and Ssangyong (1992); Toyota, Suzuki, Daihatsu and, Daimler-Chrysler (1996); and Ford, Isuzu, and Hino (1997).

Figures 2 and 3 show how automobile production and sales advanced in Viet Nam since the 2000s. The production trend in Figure 1 shows that in terms of automobile production among the five ASEAN countries with production facilities, Viet Nam and the Philippines were the lowest producers. As of 2014, Viet Nam produced 121,000 vehicles, about 6.4% of the 1.88 million of Thailand. In view of Viet Nam’s 2014 population of about 90 million, or roughly 1.3 times as large as Thailand’s 69 million

population, Viet Nam's production level is very low considering its market size. As seen in Figure 2, Viet Nam recorded 133,588 sales in 2014, in comparison with Indonesia's 1,208,019 and Thailand's 881,832. This figure is the lowest among ASEAN nations, around 11.0 % of Indonesia and around 15.1 % of Thailand. This figure is also considered extremely low in view of the population ratio between Viet Nam and the ASEAN nations. In the case of Viet Nam, a gap between production and sales is assumed to have been compensated by about 12,000 imported vehicles.

Figure 2: Vehicle Production Trend in ASEAN

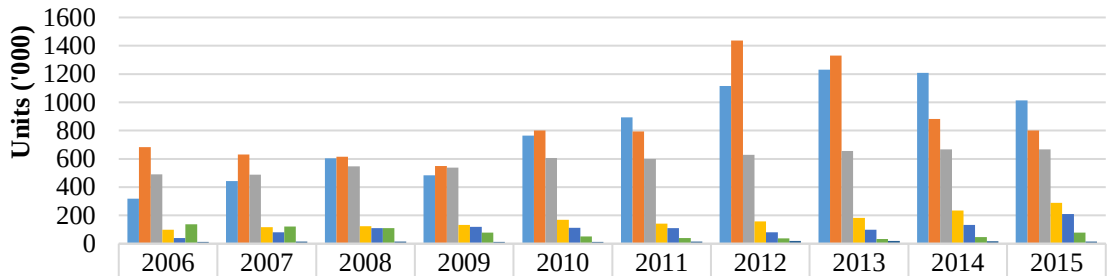


	2010	2011	2012	2013	2014	2015
Thailand	1645304	1457795	2453717	2457057	1880007	1913002
Indonesia	702508	837948	1065557	1208211	1298523	1098780
Malaysia	567715	533515	569620	601407	596418	614664
Viet Nam	106166	100465	73673	93630	121084	171753
Philippines	80477	64906	75413	79169	88845	98768

ASEAN – Association of Southeast Asian Nations.

Source: ASEAN Automotive Federation (2016).

Figure 3: Vehicle Sales Trend in ASEAN



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Indonesia	318904	443341	603774	483550	764710	894164	1116212	1229901	1208019	1013291
Thailand	682161	631251	615270	548871	800357	794710	1436335	1330672	881832	799632
Malaysia	490768	487176	548115	536905	605156	600123	627753	655794	666465	666674
Philippines	99541	117903	124449	132444	168490	141616	156654	181738	234747	288609
Viet Nam	40897	80392	110186	119460	111737	109660	80453	98649	133588	209267
Singapore	137564	122254	110574	79503	51891	39570	37247	34111	47443	78609
Brunei	12522	14220	14680	12365	13589	14555	18634	18642	18114	14406

ASEAN – Association of Southeast Asian Nations.

Source: ASEAN Automotive Federation (2016).

2.1.1. TOYOTA MOTOR VIETNAM CO., LTD.

Let us consider how automobile production is conducted in Viet Nam and look at the case of TOYOTA MOTOR VIETNAM CO., LTD., a leading company in the Viet Nam automobile industry. Toyota started its operations in Viet Nam in 1996. Since then, it has launched models one after another, including Vios, Corolla, and Camry; and captured the top market share of 31.0% in 2014. In 2006, the Japanese automaker also commenced the local production of its Innovative International Multipurpose Vehicle models, Innova and Hilux. However, the local content ratio of parts remains below 10%, and the remaining 90% (value-based), including major components, is reliant on import from Japan and ASEAN countries, mainly Thailand. In consideration of Japanese automakers' local content ratio of over 80% in Thailand, a ratio below 10% is extremely low. TOYOTA MOTOR VIETNAM CO., LTD. is integrated with

Toyota's global value chain (Gereffi and Korzeniewiez, 1994). When parts shipping cost is taken into account, locally assembled products are about 30% more expensive than imported complete vehicles of the same model and less competitive. TOYOTA MOTOR VIETNAM CO., LTD. is therefore trying to promote localisation as much as possible with the aim of reducing cost. Small stamping and plastic parts are candidates for localisation.

In the case of Vios, there are only 60 parts that are locally procured in Viet Nam, including small stamping parts which account for only less than 5%. In contrast, there are 1,050 (80%) ASEAN-procured parts. A majority of these are safety critical components, including for engine and transmission. Furthermore, most of the 1,000 (95%) ASEAN parts come from Thailand. They are packed together at the Toyota Thailand Gateway packaging plant and carried to Laem Chabang Port to be transported by sea to Hai Phong Port in Viet Nam. There, they are unloaded and carried by truck to the plant of TOYOTA MOTOR VIETNAM CO., LTD. About 200 items (16%) of components, including engines, from Japan are packaged at Toyota Tobishima Distribution Center, transported from Nagoya Port to Hai Phong Port, and then carried to the plant of TOYOTA MOTOR VIETNAM CO., LTD. like components from Thailand. Items locally procured in Viet Nam include stamping and wire-harness parts. They are supplied from local Tier 2 suppliers engaged in small stamping processing and delivered to TOYOTA MOTOR VIETNAM CO., LTD. through Toyota Boshoku as seat frame structures.

Company T is one of the few local Tier 2 suppliers.[1] Founded in 2003, it has three divisions engaged in metal stamping, plastic parts manufacturing, and processing. A

[1] Information in this paragraph is based on an interview with the president of Company T at the Hakata Business Conference on 4 November 2016.

total of 200 employees (170 plant operators and 30 office workers) work in these three divisions. Metal stamping and processing equipment in the plant consist of used Japanese machines, which are properly and cleanly maintained. Its seat frame components are delivered to Toyota Boshoku Viet Nam which supplies seats to TOYOTA MOTOR VIETNAM CO., LTD. for Vios, Camry, Innova, and Corolla; and stamping parts are delivered to Kyoei Viet Nam which supplies motorcycle frame components to Yamaha. It took three-and-a-half years until it was awarded the business from Toyota Boshoku. In addition, it supplies a small volume of stamping parts to Thai Summit Hanoi, a Thai-based firm in Hanoi, which supplies motorcycle frame parts to Yamaha and Honda. It also supplies stamping parts to Truong Hai Auto Corporation Group (THACO). Steel plate materials are sourced from Thailand and Taiwan. Its local sourcing in Viet Nam is difficult. Materials for plastic products are also supplied from Singapore.

2.1.2. THACO

THACO is Viet Nam's largest private automobile corporation founded in Bien Hoa, Dong Nai in 1997. It produces passenger cars, trucks, and buses. It has about 7,000 employees and more than 70 sales and services facilities throughout Viet Nam. In 2003, it constructed a plant in the Chu Lai Economic Zone, Quang Nam province, central Viet Nam. Since then, the company has steadily increased its production and passenger car market share. In the first half of 2014, its share reached 32.5%, topping Toyota's 30.6%. The Chu Lai plant, which has about 4,000 employees, assembles using the CKD processing system models of Korean Kia, Japanese Mazda, and French Peugeot. Most of the parts are transported by container as CKD kits from Korea, Japan, and France. To receive and handle these containers, THACO owns a wharf and

warehouse for its exclusive use. Around the assembly plant, 23 vertically integrated parts suppliers are located to produce and supply plastic components, sealing, wire harnesses, seats, and truck bodies. However, the plant has no advanced stamping equipment and has to rely entirely on shipment from Korea, Japan, and France for chassis structures and safety critical components like engines and transmissions that are carried overseas in containers. As mentioned earlier, almost no auto parts suppliers is seen in the central part of Viet Nam.

2.2. Reasons for the Small Automobile Production and Sales Volume

The Vietnamese automobile and auto parts industry is apparently in the early stage of development among other countries in ASEAN. One reason for this is Viet Nam's short history of automobile production. It was only after the 1990s that the automobile industry was designated as an industry to be fostered in Viet Nam. In the advanced countries in ASEAN like Thailand, Toyota and others were operating in the 1960s. This delay in timing was critical to the development of the auto industry in Viet Nam. Furthermore, the 1990s was a transition period in the ASEAN, when the industrial policy was shifting from development of industry to replace import to development of industry to promote exports. Also, policies to protect the domestic industry were being reconsidered or abolished. This was a big disadvantage to Viet Nam which was preparing to develop its weak domestic auto parts industry. It must also be pointed out that the Vietnamese infrastructure industry supporting the auto industry is poor in comparison with that of Thailand. One of the major reasons is the late start of the auto industry and the differences in the international environment at that time. While Thailand was blessed with enough time to develop its infrastructure industry protected by customs barriers, Viet Nam was suddenly compelled to develop its supporting

industry under a harsh international competition. This is one of the reasons that the auto parts industry, which is the supporting industry, has faced difficulties in Viet Nam. Therefore, in order to narrow this gap, the Vietnamese Government must exert greater efforts.

Another factor that has hampered the development of the auto industry in Viet Nam is the government-initiated planned economy. For late-coming automobile production countries like Viet Nam, a market-oriented economic policy is more likely to nip rather than foster the seeds of growth under the harsh pressure from outside. Therefore, an appropriate guiding policy is more likely to contribute to the sound progress of the industry. On the other hand, if it does not function properly, it could hamper the growth of the industry. The latter scenario is applicable to the Vietnamese automobile policy since the 2000s. An inconsistent automobile development policy by the government, which was severely criticised as capricious, is said to be one of the biggest factors that has obstructed the progress of the automobile industry. This is a reflection of confrontation and conflict between ministries promoting the policy. For example, there is a tug of war between the Ministry of Finance, which seeks to raise the value-added tax to maximise the financial resources, and the Ministry of Industry and Trade which seeks to develop the automobile industry. This creates rapid changes and confusion in the taxation policy, which eventually made it difficult to foster the auto industry under the long-term stable environment.

Another factor delaying the progress of the automobile industry in Viet Nam is the excessive number of automobile makers in a tiny market. The Vietnam Automobile Manufacturers' Association consists of 20 member companies, including large and small foreign and local manufacturers. In a tiny Vietnamese market with sales of only around 200,000 vehicles a year, a total of 20 makers, large and small, are competing.

Calculated simply, sales volume per company is less than 10,000. It is widely known that the development of the automobile industry depends on the volume of sales. In the case of Thailand, 1.8 million vehicles are sold by 12 companies or 150,000 per company. This is 15 times more than Viet Nam‘s sales. The favourable conditions for the development of the automobile industry in Thailand and the severe challenges that Viet Nam faces are quite obvious. Why can so many companies exist in Viet Nam? Because the Vietnamese Government did not limit the number of producers.

3. Automobile Production and Supplier Development Policy in Viet Nam

3.1. Coexistence of Motorcycle and Automobile Suppliers

One of the biggest problems of automobile production in Viet Nam is the shortage of suppliers, both in quality and quantity. In terms of cost, some parts can be procured more cheaply by importing from Japan or Thailand than from the local products. But if a certain level of volume is assured, big-sized and heavy items for stamping and plastic processing products or small standard components can be said to be procured more efficiently from local sources.

Table 10 shows the breakdown of 88 suppliers whose customers are classified according to motorcycle or automobile; and local, foreign, or Japanese suppliers.

Table 10: Number of Suppliers (for Motorcycles and Automobiles)

	Motorcycle	Motorcycle + Automobile	Automobile	Total
Local	18	12	4	**34**
Foreign	11	14	7	**32**
Japanese	4	5	13	**22**
Total	**33**	**31**	**24**	**88**

Sources: Japan External Trade Organization (2015a; 2015b); Japan International Cooperation Agency (2015).

Out of 34 local suppliers, there are 18 motorcycle manufacturers which account for 52.9% or more than half. As there are only four suppliers (11.8%) for automobile manufacturers, it is clear that local suppliers are mainly serving motorcycle makers.

Out of 32 foreign suppliers, there are 14 manufacturers for both motorcycles and automobiles, which account for 43.8% or close to half. Given that there are 11 suppliers (34.4%) that serve only motorcycle manufacturers and seven (21.9%) suppliers that serve only automobile manufacturers, we can say they deliver products mostly to both motorcycle and automobile manufacturers.

On the other hand, out of 22 Japanese suppliers, 13 (59.1%) supply to automobile manufacturers; four (18.2%) supply only to motorcycle manufacturers; and five (22.7%) supply to both motorcycle and automobile manufacturers. This undoubtedly shows they are focused on the supply to automobile manufacturers.

Out of a total of 88 suppliers covering local, foreign, and Japanese suppliers, 33 (37.5%) companies deliver to motorcycle manufacturers; 31 (35.2%) deliver to both motorcycle and automobile manufacturers; and 24 (27.3%) deliver only to automobile manufacturers. This shows that local suppliers supply to motorcycle manufacturers, foreign suppliers supply to both motorcycle manufacturers and automobile manufacturers, and Japanese suppliers supply to automobile manufacturers.

3.2. Difference Between Suppliers for Motorcycles and Automobiles

There is a big difference between motorcycle parts suppliers and automobile parts suppliers. Although the motorcycle and the automobile are driven by an engine, it should be recognized that the motorcycle is two-wheel driven and the automobile is four-wheel driven. They are completely different machines for riding. For example, if a motorcycle can be compared to a bicycle driven by an engine, a four-wheeled vehicle can be compared to a precision machine equipped with an engine.

The precision and quality levels required of motorcycle and automobile parts are completely different. Automobile parts require stringent precision and quality levels. While motorcycle parts are generally small in size and low in cost, auto parts are mostly larger in size and higher in cost. The number of auto parts ranges from 20,000 to 30,000 per car, which is roughly 10 times as much as a motorcycle. Motorcycle parts are mostly exterior parts, except for the engine components. Moreover, auto parts have a higher share of safety and security components, in addition to the engine components. The required precision and quality levels are also quite different between motorcycle parts suppliers and auto parts suppliers. Despite these differences, engine parts for motorcycles and automobiles demand the same precision and quality levels. Although motorcycle engines are smaller in displacement and structure than engines for automobiles, there is no difference in the technological precision and quality required. Furthermore, while parts downsizing involves great difficulty in technology, increasing parts' size is less difficult. It is, therefore not an exaggeration to say that suppliers that are delivering engine parts for motorcycles are placed in the nearest position for entering the vehicle business.

3.3. Entry Process of a Motorcycle Supplier to an Automobile Supplier

Motorcycle parts suppliers who seek to become automobile parts suppliers encounter difficulties. A motorcycle supplier entering the auto parts market has to install test equipment like a three-dimensional measuring device, as well as secure and train personnel necessary to operate the equipment. The development of such human resources takes at least three to five years. When its preparations have been completed, the supplier must visit prospective customers one after another carrying a set of three items: prototype samples, price estimates, and measurement data reports. Then the supplier waits for an adoption or rejection reply. Business events or conferences held by government organisations or carmakers offer opportunities for meeting potential customers. In terms of timing, new car designs or model changes also provide good opportunities for entry. Even after a successful entry, it must be recognised that it will take another one-and-a-half years to two years until the launch of volume production. During this period, the would-be supplier must undergo corporate evaluation and process inspection from the customer on several occasions. Each time, such requests from the customer must be responded to appropriately by the supplier. In addition, the firm must invest in necessary equipment prior to volume production. In consideration of the necessary advance investment of closer to ¥10 million on a measuring device alone, financial support from the government may be necessary. However, once the new supplier has successfully entered the auto parts business, it can continue to receive orders and secure stable profits as long as that particular model is produced.

It will therefore take from one-and-a-half years to longer than two years to enter into the automobile parts production business. It may take even three to five years if the preparation period prior to production start is included. During the preparation period, while the supplier must make expenses for the auto parts division, it cannot

receive revenue from the automotive division. This means that during three to five years period including preparation period, an alternative revenue source must be secured. A supplier that is already manufacturing motorcycle parts can use this revenue source as it can take several years to enter the new auto parts sector.

3.4. Assistance to Motorcycle Suppliers for Entry into the Automobile Segment

So far, we have discussed that the development of the automobile industry requires great corporate efforts and rather large funding. However, if a company gets into this business, long-term and sustainable profits will be guaranteed. While there are opinions that Viet Nam should not stick to the domestic production of automobiles as it can be replaced by import, and that Viet Nam should focus its industrial policy on industrial segments favourable to Viet Nam such as apparels and telecommunication devices (Inagaki 2015), we cannot deny the significance of developing automobile production in view of its profound impact on the nation's economy. The automobile industry is generally called a '10% industry.' In the United States., Japan, Korea, and countries in Europe, the automobile industry is said to account for 10% of employment, gross domestic product, and export. Considering the great impact of the auto industry on the national economy and its far greater technological importance than the apparel or textile industry, automobile production can never be replaced by the apparel or textile industry.

Therefore, what sort of corporate efforts and government assistance are necessary to shift motorcycle parts suppliers that have accumulated the industrial experiences in Viet Nam into auto parts suppliers?

First, a company-wide comprehensive program should be launched to elevate the quality, cost, and delivery (QCD) levels to required standards. This means that entering

the automobile industry demands higher precision and quality levels than those found in the motorcycle industry. In view of the importance of instilling innovation awareness at the floor level in particular, a company-wide campaign to improve QCD must be undertaken under a firm-wide consensus. The project should involve all employees — from the president to the workers at the shop floor — to achieve a complete shift in their consciousness.

Second, the capability to make proposals and improvements should be strengthened. Even after entry into the automobile segment, a supplier continuously receives cost reduction requests. Unless it autonomously proposes improvements, it cannot keep a long-term stable business and expansion. Such capability can be created as a result of a company-wide campaign for an innovation consciousness.

Third, entry into the automobile industry is assumed to take at least three years to five years for Vietnamese corporations. This is actually the time limit for Viet Nam to cope with the forthcoming ASEAN Economic Community (AEC), which will abolish import duties in 2018. In addition to the advancement of technological capabilities, capital investment must be increased for larger stamping equipment and refurbishing the building to support its weight in the case of stamping; and for installing a larger plating bath and enlarging processing capacity for plating. During this experimental process, when investments have to be made, there is no revenue to compensate for investments. Cash flow must be maintained by other means. If adequate funding capacity is not available, an attempt to enter into the automobile industry by parts suppliers from other industries will be close to impossible.

Along with the efforts of individual companies, assistance policies from the government are important. First, a policy to increase the sale of automobiles must be implemented. Reduction of taxes related to the purchase of automobiles should come

first. Second, concrete assistance programs must be provided to help motorcycle suppliers enter the auto parts market. They should include financial subsidies for acquiring expensive equipment such as measuring devices, support for the training and education of operators to acquire skills and expertise for quality control, production control, workshop management, and mass production technologies.

Such assistance policies from both the individual companies and the government enable the motorcycle parts makers to convert to auto parts suppliers smoothly.

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