

# The Supplier System of the Motorcycle Industry in Vietnam, Thailand and Indonesia

## Localization, Procurement and Cost Reduction Processes\*

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This paper compares the features of the supplier systems of the motorcycle industry in Vietnam, Thailand and Indonesia, and suggests measures to develop the motorcycle industry in Vietnam. Special attention is given to the localization effort, procurement patterns and cost reduction processes of Japanese motorcycle manufacturers operating in these countries. Information gathered through the author's interviews and factory visits with Japanese motorcycle assemblers and parts producers from 2002 to 2004 are extensively used.

### 1. Overview

The motorcycle industry operates and competes in the global market where consumers' tastes in different countries play a significant role in determining its trend. Let us therefore begin our study with an overview of the motorcycle industry in the world.

Figure 1 shows the production, sales, exports and investment flows of the motorcycle industries in main producer countries in 2003. The size of each circle indicates the relative production volume. White arrows represent trade flows while black arrows illustrate foreign direct

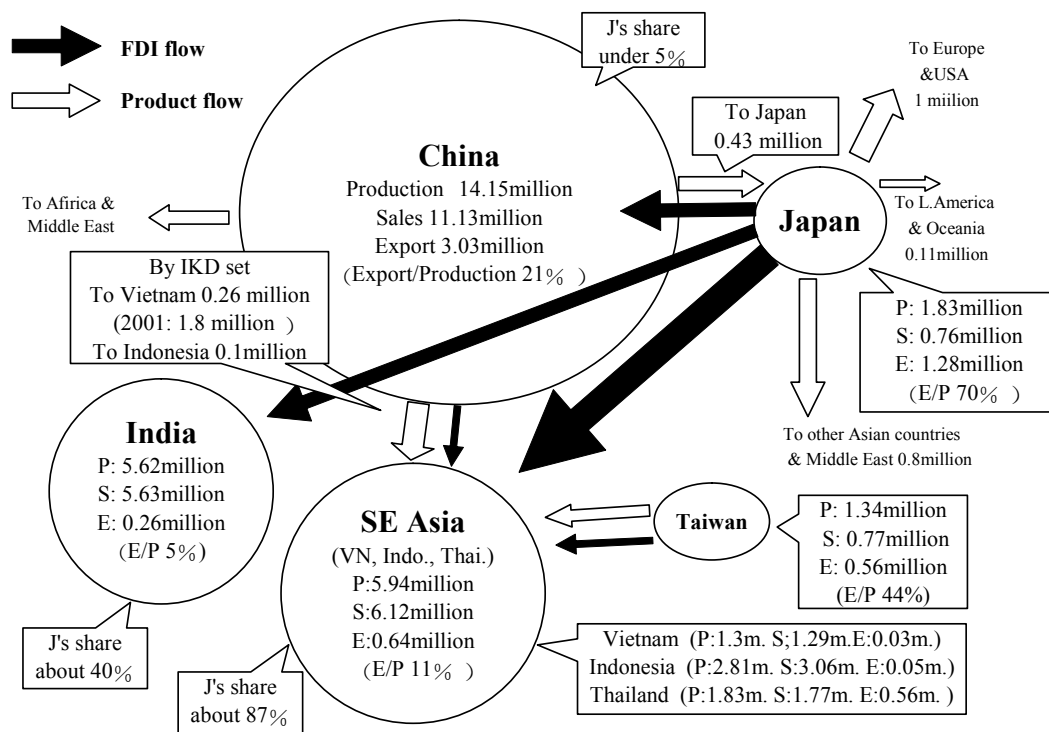
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investment (FDI) flows. It is noteworthy that global production is dominated by several Asian countries and the sum of the production volumes in the Asian countries shown in Figure 1 (28.88 million ) makes up about 95 % of total global production (30.47 million) in 2003.

Moreover, the motorcycle industry has grown rapidly and drastically in recent years. Global production increased from 12.2 million in 1991 to 30.47 million in 2003, an increase of 150 % in twelve years (Honda 1991). In Asia, the combined production volume of China, India, Vietnam, Thailand and Indonesia rose from 4.04 million in 1991 to 25.71 million in 2003 (an increase of 536 percent), and the combined production volume of Vietnam, Thailand and Indonesia (the three countries featured in this paper) rose from 1.12 million in 1991 to 5.94 million in 2003 (an increasing of 430 percent). It follows that Southeast Asian countries have been major players in the development of the global motorcycle market.

**Figure 1. Production, Market, Export and FDI in Motorcycles in 2003**



**P: production    S: sales    E: export    E/P: export to production ratio**

Notes: The size of each country's circle represents production volume. Export volume and export ratio of Indonesia and export volume from China to Vietnam are 2002 data. "J's share" means the market share of Japanese producers in local market.

Sources: Honda (2004) and the author's interviews.

**Table 1. Market Indicators in Vietnam, Thailand and Indonesia in 2003**

	<b>Vietnam</b>	<b>Thailand</b>	<b>Indonesia</b>
Population	81.3 million	62.0 million	214.4 million
GDP per capita	\$454	\$2,190	\$953
Domestic use (stock)	11.4 million	18.2 million	19.4 million
Market size (sales per year)	1.29million	1.74million	3.08million
Persons per vehicle	7.1	3.4	11.0
Sales share of Japanese makers	40.7%	96%	90%
Sales share of "Chinese" motorcycles	40.4%	3%	8%
Retail price of Japanese makers' low-end model (2004)	\$750	\$684	\$1,120
Availability of sales by installments (2004)	×	○	○
Second-hand market (2004)	△	○	○

Note: Sales shares in Vietnam is for the first half of 2003.

Sources: For population, World Bank ([www.worldbank.org](http://www.worldbank.org)); for GDP per capita, JETRO ([www.jetro.go.jp/indexj.html](http://www.jetro.go.jp/indexj.html)); for domestic use and market size, Honda (2004); for other data, the author's research and interviews.

Additionally, Figure 1 also shows that there is a significant transfer of production capacity of Japanese producers to Asian countries through FDI while Chinese producers tend to produce for the domestic market or export knock down (KD) sets to Southeast Asian countries<sup>1</sup>. One important point to note here is the state of competition of the motorcycle industry in the Southeast Asian countries. In Thailand and Indonesia, the Japanese makers have gained a strong advantage over Chinese motorcycles as indicated by their market shares in these countries, which are over 90% (Table 1)<sup>2</sup>. Therefore, for Thailand and Indonesia the experiences of

<sup>1</sup> The term "Chinese motorcycle" in this paper will be used to refer to motorcycles which the CKD set is imported from China and assembled by a local firm. Chinese motorcycles are sold at about \$400-600. These prices were half of those of Japanese motorcycles around 2000.

<sup>2</sup> There are mainly two reasons why the share of Chinese motorcycles is low in Thailand and Indonesia. Firstly, on the supply-side, laws on environment and intellectual property are more strictly enforced in Thailand and Indonesia. As Chinese motorcycles are not able to meet the standards, local firms cannot assemble Chinese motorcycles easily. Secondly, on the demand side, consumers in Thailand and Indonesia are used to high quality motorcycles made by Japanese firms. As Chinese motorcycles cannot meet their demands for high quality, the sales are poor. Additionally, in Thailand the average price of motorcycles made by Japanese producers was already low (under \$800) before Chinese motorcycles penetrated, and therefore the price advantage of Chinese motorcycles was not so strong. In Indonesia, consumers highly regard the asset value of a motorcycle because there is an active second-hand market and almost all customers use credit in buying motorcycles. However, Chinese motorcycles sell poorly in the second-hand market, and the credit purchase of Chinese motorcycles is unavailable.

Japanese producers which set up their business operation in these countries are the key to understanding the motorcycle industry. In Vietnam, by contrast, the situation is much different and more dynamic. The shares of Japanese and “Chinese” products are both about 40%, and some “Chinese” motorcycles are now produced by Vietnamese firms using Vietnamese parts. The rapid change in the Vietnamese market is examined in detail in Chapter XX of this book. Here, we shall discuss the subject from the Japanese producers’ point of view.

## **2. The Development and Localization of Japanese Producers**

### ***The history of industrial development***

In each of the Southeast Asian countries that manufacture motorcycles, the industry took off when Japanese producers began to invest in them. For Vietnam, Thailand and Indonesia, the development patterns are summarized in Table 2.

In Thailand and Indonesia, the motorcycle industry has developed under the protection and strict regulation of the government for an extended period of time. But Vietnam, whose motorcycle industry is in an early phase of development, is already exposed to international competition. More specifically, one can cite three facts from Table 2 to confirm this point. Firstly, as of the end of 2004, the history of modern motorcycle production is only 8 years in Vietnam while it is 40 years in Thailand and 33 years in Indonesia. Secondly, the period in which local content requirement was imposed in Vietnam was two years, which is about one-fourth of its industrial history. Meanwhile, the period of local content restriction lasted 26 years in Thailand covering 65% of its industrial history. Thirdly, the period of import ban on completely built units (CBU) has been 6 years in Vietnam but as long as 18 years in Thailand.

**Table 2. History of the Motorcycle Industry in Vietnam, Thailand and Indonesia**

(Arrows indicate duration of local content restriction or import ban)

	Vietnam	Thailand	Indonesia
1960	1964 Vietnam War ⋮		
1970	⋮ 1975		
1980	1986 Doi Moi		
1990			
2000	↓		

Note: Honda, Suzuki and Yamaha in this table indicate the year of establishment.

Sources: The author's interviews, Yokoyama (2003), and Mihara and Satou eds. (1992).

### ***The stages of localization in Thailand and Indonesia***

The motorcycle industry has developed in steps in Thailand and Indonesia. The development of the motorcycle industry in these countries can be divided into five stages by the criteria of the number and capability of suppliers, local procurement ratios, production volume, and so on. These stages are explained in detail below<sup>3</sup>. In the first three stages, industrial policies including

<sup>3</sup> This section is based on the information collected by the author's research conducted in Vietnam, Thailand, Cambodia and Laos in August and September 2002 (in Vietnam, Associate Professor Hirofumi Ueda accompanied the author as part of the NEU-JICA joint research); in Vietnam and Thailand in March 2003 (with Associate Professor Nozomu Kawabata as part of the NEU-JICA joint research); in Vietnam in July 2003 (with Associate Professor Hirofumi Ueda as part of the NEU-JICA joint research); in Thailand and Indonesia in February and March 2004; in Vietnam, Thailand and Indonesia in September 2004 (in Vietnam, the author was with Professor Kenichi Ohno, Associate Professor Hirofumi Ueda, and Pham Truong Hoang (Yokohama National University) as part of research for the VDF motorbike week). For further details of these research trips, see Ueda and Mishima (2003) and Mishima (2004 a; 2004 b).

local content requirement and import ban on CBU were strictly enforced. In the last two stages, industrial policy was more limited in scope and the positioning strategies of competing enterprises became the dominant driving force of the industry.

#### **First stage—complete knock down (CKD)**

The first stage of localization is production by CKD. In Thailand, this form of production was observed from 1967 when Honda initiated its operation to 1978 when tariffs for imported parts were raised. In Indonesia, the corresponding period lasted from 1971 when Honda started its operation to 1978 when localization policy became stricter. Both countries stayed in the first stage for about ten years. During this stage, annual production volume was about 100,000 in Thailand and about 300,000 in Indonesia. In particular, the production volume of Astra Honda Motor (AHM), the leading producer in Indonesia, was about 100,000. In the first stage, engines and electrical parts had to be imported and assemblers had engaged exclusively in assembly by KD production. Even the number of domestic suppliers of underbody parts like tires, batteries and harnesses was still very small. Importing these bulky and heavy parts resulted in high delivery costs.

#### **Second stage—localization through in-house production**

In the second stage of localization, assemblers switch from imported parts to in-house production. As this happens, the localization ratio begins to rise. In Thailand and Indonesia, this stage lasted about ten years from 1978 to the late 1980s. The typical production volume of a country in the second stage is about 300,000 per year and the localization ratio often rises to above 50%. AHM in Indonesia produced from 200,000 to 300,000 per year at this time. For part production, the minimum production scale for efficiency is normally about 200,000 to 300,000, but in this stage each country's *total* production was about 300,000. For this reason, it was very difficult to entice any foreign supplier to invest and attain an efficient scale of production unless it could capture the entire national market of that part. For this, the part had to have large commonality across assemblers and the monopoly of that product by a single company had to be permitted and accepted. Since these conditions were not easy to meet, assemblers tried to raise local procurement mainly by in-house production. As a result, localization rose but the number of part suppliers in that country did not increase very much. Nevertheless, in this relatively early stage, assemblers began to produce engines internally. To raise the localization ratio, they often invited (or required) engine and electrical part suppliers to come to that country to support the assemblers.

### **Third stage—the arrival of key part suppliers**

In the third stage of localization, suppliers of important parts such as engine begin to invest in that country voluntarily and independently from the request of assemblers. In Thailand and Indonesia, this stage lasted several years from the late 1980s to 1997 when the Asian financial crisis broke out. In this stage, annual production usually exceeds 500,000 and the local content ratio rose to above 70%. AHM boosted their production from 250,000 in 1991 to 880,000 in 1997. As the optimum production scale for most part suppliers is 1 million or slightly above it, the production scale of the country in this stage was just short of that level. As the market size problem was about to be solved in the near future, a large number of suppliers started to arrive in expectation of rising sales. In the third stage, assemblers switched from in-house production to outsourcing of key parts such as engine, carburetor, brake, and so on. KD imports decreased significantly.

### **Fourth stage—the broad agglomeration of supporting industries**

In the fourth stage of localization, virtually all kinds of suppliers including electrical parts set up business in that country. Not only first-tier suppliers but also second-tier suppliers such as metal pressing and sheet processing also come. The local subcontracting network becomes extensive. Thailand entered this stage only a few years ago in the late 1990s to 2001. Indonesia also seems to have entered the early days of this stage from the late 1990s. Annual production rises above 1 million, and local content ratios are about 90%. In 2003 the production volume of the following companies were as follows: Thai Honda MFG (1.3 million), Thailand Yamaha (0.21 million), AHM (1.58 million), and Indonesia Yamaha (0.57 million). In the third stage when there is only zero or one supplier for each part, an existing supplier can easily receive orders from assemblers. However, in the fourth stage the number of suppliers increases to three or four for each part, which leads to stiff competition among them to obtain orders. Since these suppliers have sufficient capacity to meet assemblers' requirements for quality, cost and delivery (QCD), the competition will be the pursuit of low costs while maintaining a high standard of QCD. In the fourth stage, the content of industrial policy shifts significantly from import-substitution through protection to a more limited one of providing safety standards, environmental regulation and the like. As the industrial environment is liberalized, the business strategy of each firm becomes relatively more important and prominent.

### **Fifth stage—R&D and exports**

In this final stage of localization, Japanese producers begin to transfer R&D from

Japan to the host country. A full-scale export strategy from the production base of that country begins to be implemented. Thailand is considered to be experiencing the beginning of the fifth stage in which, if realized, the breadth of its supplier system will be furthered strengthened. This in turn should become the source of cost competitiveness of the Thai motorcycle industry.



**Table 3. Development of the Motorcycle Industry: Thailand**

		Japanese Makers		Production				Sales		Export
		FDI entry	Cumulative	Total		Thai Honda MFG		Quantity	Annual growth	
				Quantity	Annual growth	Quantity	Annual growth			
1967		0	0	N.A.	-	3,300		N.A.	-	-
1968		0	0	N.A.	-	17,043	516.5%	N.A.	-	-
1969		1	1	N.A.	-	17,107	100.4%	N.A.	-	-
1970		3	4	N.A.	-	18,996	111.0%	N.A.	-	-
1971		0	4	N.A.	-	12,154	64.0%	N.A.	-	-
1972	First Stage	0	4	N.A.	-	12,500	102.8%	N.A.	-	-
1973		1	5	N.A.	-	14,700	117.6%	N.A.	-	-
1974		0	5	N.A.	-	15,250	103.7%	N.A.	-	-
1975		0	5	N.A.	-	22,100	144.9%	N.A.	-	-
1976		1	6	99,015	-	30,900	139.8%	178,190	-	-
1977		1	7	148,612	150.1%	42,000	135.9%	233,210	130.9%	16
1978		0	7	119,776	80.6%	49,545	118.0%	222,480	95.4%	19
1979	Second Stage	0	7	244,020	203.7%	69,505	140.3%	252,498	113.5%	617
1980		0	7	283,971	116.4%	67,300	96.8%	306,459	121.4%	-
1981		2	9	307,199	108.2%	89,300	132.7%	291,987	95.3%	-
1982		0	9	296,027	96.4%	84,788	94.9%	334,252	114.5%	-
1983		1	10	313,280	105.8%	106,662	125.8%	348,409	104.2%	-
1984		0	10	320,563	102.3%	78,180	73.3%	317,020	91.0%	-
1985		0	10	228,673	71.3%	41,400	53.0%	263,392	83.1%	-
1986		2	12	241,184	105.5%	57,300	138.4%	254,949	96.8%	-
1987		2	14	310,083	128.6%	72,018	125.7%	305,828	120.0%	-
1988	Third Stage	1	15	447,533	144.3%	167,200	232.2%	330,770	108.2%	2,590
1989		5	20	592,200	132.3%	227,600	136.1%	590,365	178.5%	1,346
1990		3	23	718,869	121.4%	286,084	125.7%	743,424	125.9%	-
1991		1	24	673,254	93.7%	268,230	93.8%	664,472	89.4%	1,222
1992		1	25	815,757	121.2%	354,800	132.3%	849,580	127.9%	21,762
1993		2	27	1,122,656	137.6%	501,000	141.2%	1,027,344	120.9%	39,285
1994		5	32	1,275,000	113.6%	620,700	123.9%	1,275,403	124.1%	398,310
1995		6	38	1,600,000	125.5%	728,000	117.3%	1,464,942	114.9%	N.A.
1996		10	48	1,437,794	89.9%	703,800	96.7%	1,236,143	84.4%	177,635
1997		15	63	1,079,544	75.1%	543,900	77.3%	910,647	73.7%	137,055
1998	Fourth Stage	2	65	600,497	55.6%	371,460	68.3%	526,845	57.9%	244,546
1999		2	67	846,426	141.0%	445,840	120.0%	604,012	114.6%	283,322
2000		1	68	852,580	100.7%	595,600	133.6%	783,678	129.7%	237,607
2001		1	69	945,932	110.9%	706,300	118.6%	907,100	115.7%	253,428
2002	Fifth Stage	0	69	1,547,000	163.5%	1,012,900	143.4%	1,327,675	146.4%	541,127
2003		1	70	1,831,698	118.4%	1,298,718	128.2%	1,766,860	133.1%	559,932

Note: The number of FDI entry does not cover all Japanese producers related to the motorcycle industry as some of the small suppliers and those that supply to more than one industry are omitted. However, the figure captures the general trend as it includes all of the major Japanese makers. Withdrawals are not shown, but their number is very small.

Sources: For Thai Hond MFG., the author's interview; for Japanese makers, Toyokeizai (2004) and the author's interviews; for other data, Honda, various years.

**Table 4. Development of the Motorcycle Industry: Indonesia**

		Japanese Makers		Production				Sales		Export
		FDI entry	Cumulative	Total		Astra Honda Motor		Quantity	Annual growth	
				Quantity	Annual growth	Quantity	Annual growth			
1967		0	0	N.A.	-	N.A.	-	N.A.	-	-
1968		0	0	N.A.	-	N.A.	-	N.A.	-	-
1969		0	0	N.A.	-	N.A.	-	N.A.	-	-
1970		0	0	N.A.	-	N.A.	-	N.A.	-	-
1971		1	1	N.A.	-	1,527	-	N.A.	-	-
1972	First Stage	0	1	N.A.	-	39,154	2564.1%	N.A.	-	-
1973		0	1	267,330	-	80,220	204.9%	N.A.	-	-
1974		3	4	300,000	112.2%	112,276	140.0%	N.A.	-	-
1975		1	5	300,700	100.2%	96,771	86.2%	N.A.	-	-
1976		1	6	270,000	89.8%	94,772	97.9%	194,214	-	-
1977		0	6	302,000	111.9%	97,665	103.1%	239,289	123.2%	1,515
1978		4	10	320,000	106.0%	101,223	103.6%	235,658	98.5%	1,477
1979			0	10	212,572	66.4%	78,886	77.9%	190,744	80.9%
1980		0	10	409,985	192.9%	147,206	186.6%	438,890	230.1%	641
1981		0	10	503,273	122.8%	214,697	145.8%	678,428	154.6%	-
1982		0	10	557,439	110.8%	257,719	120.0%	578,134	85.2%	-
1983	Second Stage	0	10	375,400	67.3%	156,878	60.9%	381,352	66.0%	-
1984		0	10	272,218	72.5%	129,824	82.8%	290,135	76.1%	-
1985		0	10	226,788	83.3%	125,910	97.0%	229,585	79.1%	-
1986		0	10	313,117	138.1%	162,500	129.1%	333,690	145.3%	-
1987		1	11	248,369	79.3%	132,835	81.7%	246,992	74.0%	-
1988		0	11	260,256	104.8%	153,793	115.8%	260,256	105.4%	-
1989		0	11	288,516	110.9%	166,521	108.3%	292,086	112.2%	-
1990			3	14	409,062	141.8%	235,048	141.2%	414,699	142.0%
1991		1	15	445,268	108.9%	254,456	108.3%	440,179	106.1%	7,483
1992		0	15	488,524	109.7%	264,336	103.9%	458,325	104.1%	27,556
1993	Third Stage	0	15	621,085	127.1%	365,108	138.1%	577,465	126.0%	45,127
1994		1	16	781,404	125.8%	425,485	116.5%	721,824	125.0%	63,380
1995		3	19	1,042,938	133.5%	520,521	122.3%	984,411	136.4%	43,999
1996		8	27	1,425,373	136.7%	695,048	133.5%	1,426,902	144.9%	50,255
1997		2	29	1,861,111	130.6%	887,927	127.8%	1,852,906	129.9%	51,816
1998			0	29	519,404	27.9%	288,400	32.5%	517,914	28.0%
1999		1	30	571,953	110.1%	288,032	99.9%	587,402	113.4%	99,651
2000	Fourth Stage	0	30	982,380	171.8%	488,888	169.7%	979,422	166.7%	115,278
2001		7	37	1,644,133	167.4%	940,069	192.3%	1,650,770	168.5%	74,948
2002		4	41	2,318,238	141.0%	1,430,000	152.1%	2,019,196	122.3%	52,517
2003		1	42	2,814,054	121.4%	1,580,000	110.5%	3,063,798	151.7%	N.A.

Note: See Table 3.

Sources: For Astra Honda Motor, the author's interviews; for Japanese makers, Toyokeizai (2004) and the author's interviews; for other data, Honda, various years.

### 3. The Stage of Localization in Vietnam

In 1996 foreign motorcycle assemblers began to invest in Vietnam. Following this move, roughly ten part suppliers came to Vietnam by 1998<sup>4</sup>. These suppliers mainly produced tires, batteries and wire harnesses. While there are no independent engine part suppliers in Vietnam even today, Machino Auto Parts Co.,Ltd (MAP) which was established jointly by Honda group suppliers now produces functional components like engine parts and electrical parts.

In Vietnam the ratio of in-house part production by assemblers remains high and a large number of KD sets are imported from Thailand. Total production by Japanese assemblers in Vietnam amounted to about 600,000 in 2003. The local content ratio of Honda Vietnam (HVN) is about 81%<sup>5</sup>. HVN alone produced 450,000 motorcycles in 2003. By the criteria of the previous section, Vietnam is in the third stage of localization from the viewpoint of production scale, but still in the second stage from the viewpoint of the agglomeration of part suppliers and the development of the subcontracting system. As we saw above, localization in Indonesia is in the fourth stage and Thailand is moving from the fourth to the fifth stage. However, it is safe to say that Vietnam's localization remains mainly in the second stage and only partly in the third stage.

**Table 5. Development of the Motorcycle Industry: Vietnam**

		Japanese Makers		Production				Sales				Export
				CKD	IKD			Quantity	Annual growth	HVN		
		Local	FDI		(HVN)	Quantity	Annual growth					
1996	First Stage	4	4	N.A.	N.A.	N.A.	-	477,000	-	-	-	0
1997		3	7	N.A.	N.A.	N.A.	N.A.	225,477	47.3%	N.A.	-	0
1998		5	12	N.A.	N.A.	N.A.	82000	302,767	134.3%	81,000	-	0
1999		1	13	163,881	178,975	211,676	99,000	468,791	154.8%	94,000	116.0%	0
2000	Second Stage	0	13	65,775	1,268,819	294,697	166,000	1,693,491	361.2%	162,000	172.3%	0
2001		0	13	14,852	1,869,922	284,624	163,000	1,997,807	118.0%	170,000	104.9%	0
2002		1	14	24,137	263,738	622,408	389,000	2,070,701	103.6%	391,000	230.0%	8,000
2003		1	15	N.A.	N.A.	N.A.	450,000	1,291,015	62.3%	429,000	109.7%	26,110

Note: See Table 3. Total production volume (local and FDI) in 2003 is estimated to be about 1.3 million by HVN.

Sources: For production, NEU-JICA Cooperative Project Team research of Vietnam motorcycle industry (2003),

Table 2-1, and the author's interviews; for sales and export, Honda (2004) and the author's interviews; for Japanese makers, Toyokeizai (2004) and the author's interviews.

What is the future prospect of localization in Vietnam? The current situation in Vietnam is quite

<sup>4</sup> This section is based on information collected by the author's research mentioned in footnote 3.

<sup>5</sup> According to the interview with HVN in September 2004, the local content ratio of Wave  $\alpha$  is 83%, and an average local content ratio of HVN products is about 81%. Other Japanese assemblers' local content ratios are lower than that of HVN.

different from the situations of the second and third stages in Thailand and Indonesia in the past. The most important difference is the fact that the Vietnamese government can no longer adopt import-substitution strategy by protecting and promoting local infant industries in the same way as in earlier decades. Another related difference is that the country is compelled to join the global economic system and conform to the principles of the market economy at a relatively early stage of industrial development.

However, it does not follow that localization in Vietnam will not advance any more or will not reach the levels of Thailand or Indonesia. While the situations have changed, some of the changes are not necessarily unfavorable. Four new conditions which should help Vietnam to develop the motorcycle industry can be cited. Firstly, the scale of production in Vietnam is larger than the scales experienced by Thailand and Indonesia in the corresponding stages. Secondly, Thailand and Indonesia currently have little surplus capacity to export to Vietnam. Thirdly, the Chinese motorcycle shock in recent years has already pressed producers operating in Vietnam to improve their capability with respect to quality, cost and delivery (QCD). Fourthly, there is a relatively broad base of foreign suppliers in Vietnam in terms of nationality. Especially, more Taiwanese firms set up business in Vietnam than in Thailand and Indonesia. These potentially favorable conditions may make accelerated localization a more attractive choice for assemblers in Vietnam than continuing to import a large number of parts from abroad. Therefore, it seems reasonable to expect that localization will continue to proceed in Vietnam as it happened in Thailand and Indonesia—albeit for somewhat different reasons. Needless to say, the self-help effort of each producer is also crucial in promoting further localization in Vietnam, an issue which will be discussed below.

If this presumption is warranted, the paths traveled by Thailand and Indonesia in the past show Vietnam's possible situations in the near future: many suppliers will invest in Vietnam, the imports of KD sets will decrease, and internal part production by assemblers will gradually be replaced by outsourcing through the subcontracting system. However, a transition to domestic R&D may take a substantial amount of time.

#### **4. The Procurement Structure of Japanese Producers**

Since a motorcycle assembler can hardly produce all the parts used in the production process, a subcontracting system of part supply naturally arises. The pattern of part procurement reflects the stage of localization and the specific characteristics of parts in question. This section analyzes the behavior of Japanese producers in Vietnam, Thailand and Indonesia from the

viewpoint of the structure of the subcontracting system<sup>6</sup>.

***Determination of parts to be imported or locally procured***

The general tendency of Japanese producers in these countries is to locally procure as many parts as possible but depend heavily on imported raw materials and high-tech electronic components—such as steel sheets, chemicals and integrated circuits—for producing local parts. But there are significant variations across countries as well. Table 6 shows the procurement structure of Japanese producers with special attention on the distinctions between local procurement and imports, internal production and subcontracting, and common parts and exclusive parts.

**Table 6. Procurement Pattern of Japanese Motorcycle Producers**

Parts Module		Japan	Vietnam		Thailand		Indonesia		China		
			Honda Wave	Yamaha	Honda WaveZ	Yamaha	Honda Karisma	Yamaha	Japan-China Joint	Chinese upper	Chinese lower
Engine Parts	Cylinder Block	◎	◎	◎	◎	◎	◎	● *	◎	●	○
	Cylinder Head	◎	◎	◎	◎	◎	◎	● *	◎	◎●	○
	Piston	●	-	△	-	●	◎	-	◎●	●○	○
	Piston Ring	●	△	△	-	●	-	-	●△	△○	○
	Oil Pump	●	△	●	●	●	-	-	●△	○	○
	Carburetor	●	-	△	●	●	△	-	●	○△	○
	Clutch	●	●	△	●	●	●	◎●	●	●△	○
Transmission	◎	●	△	●	◎	●	●	●△	●○	○	
Underbody Parts	Wheel	●	●	●	●○	●	◎●	●	●	○	○
	Tire	○	●	●	●	●	●	●	●○	○	○
Other Functional Parts	Fuel Tank	●	-	◎	-	◎	◎	●	◎●	●	●○
	Muffler	●	●	●	●	◎	-	●	◎●	●	○
	Suspension	●	●	●	-	●	●	●	●	○	○
	Body	◎●	◎	◎	◎	◎	◎	◎	◎●	◎●	○
Electric Parts	Power Generator	●	-	◎	-	●	●	●	●○	○	○
	Lamp	●	●○	●	●○	●	●	● *	●	●○	○
	Meter	●	●	●	●	◎	●	● *	●	●○	○

Note: ◎ in-house production; ● subcontracting, custom-made; ●\* subcontracting, custom-made by totally-held subsidiary; ○ subcontracting, multi-purpose; △ import.

Sources: For Vietnam, Thailand, Indonesia and Japan, the author's research; for China, Sugiyama and Otawara (2002), and Matsuoka (2002).

In Thailand and Indonesia where local content ratios are already as high as 90% or above, almost all parts can be procured domestically but raw materials and electronic components are

<sup>6</sup> This section is based on information gathered in the above-mentioned research as well as the research trips conducted in Hamamatsu and Iwata in Japan in July 2002; in Kumamoto in February 2003 (with Associate Professor Hirofumi Ueda and Associate Professor Shousei Ri of Osaka City University); and in Iwata in December 2003.

imported from Japan<sup>7</sup>. Meanwhile, the local content ratio of HVN is about 81% because there are fewer suppliers. Imported parts include not only raw materials but also key parts such as piston ring, oil pump, crank and shaft, and so on, which are locally procured in Thailand or Indonesia. When the policy of linking part import tariffs to the localization ratio was in place, assemblers regarded an increase in localization as the top priority even if it added to the total production cost. However, since this policy was removed in 2003, assemblers began to import more inexpensive parts rather than producing them in Vietnam.

### ***Determination of parts to be produced internally or outsourced***

Table 6 also points to the two criteria of the Japanese producers in deciding whether the part should be produced in their factories or purchased from other firms. Firstly, Japanese assemblers continue to produce essential parts (especially functional components such as engine parts) and bulky parts (such as body parts) by themselves. Japanese assemblers procure other parts from a few designated suppliers with long-term relationship rather than buying them in the open market with short-term contracts. Secondly, Japanese assemblers use custom-designed parts for their models and not universal parts. From the perspective of business architecture, it can be said that the procurement features of Japanese producers in Vietnam, Thailand and Indonesia are basically the same as that in Japan. In other words, Japanese motorcycle producers adopt *closed-integral* business architecture at home and abroad. This topic is taken up in the next section.

## **5. The Cost Reduction Process of Japanese Producers**

Since around 2000, the retail prices of motorcycles fell significantly in the region under intense competition. We now consider how each producer responded to this price reduction. On the surface the competitiveness of a motorcycle producer may be revealed by its retail prices, but true competitiveness is better gauged by its ability to reduce costs net of fluctuating profits. On the one hand, Japanese producers in Southeast Asia import almost all materials, but as the prices of basic materials rose unexpectedly and significantly in recent years, and as materials occupy a large part of the production cost, it is very difficult for Japanese producers to reduce costs in this global market environment. On the other hand, as the quality of materials required by Japanese producers is very high, suppliers are not allowed to use lower-quality materials to reduce costs. Let us examine this dilemma more closely for the case of Japanese manufacturers in Thailand<sup>8</sup>.

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<sup>7</sup> In some cases, base materials are imported from Japan to be processed by Japanese affiliated steel makers in the host country. But most raw materials are directly imported from Japan.

<sup>8</sup> This section is based on the author's field trips conducted in Thailand as mentioned above.

***Assembler: Thai Honda Manufacturing Co.,Ltd.***

As cheap motorcycles assembled from Chinese parts invaded Vietnam and suddenly occupied a high market share, the low-end market rapidly expanded in Vietnam. Honda Vietnam responded by introducing a low-end model, Wave  $\alpha$ , and regained the market share significantly. Through this incident in Vietnam, Honda realized the possibility of market expansion by introducing low-end models. As a result, the retail prices of motorcycles in Thailand were also reduced from USD 963 to USD 650, or by about one-third.

Thai Honda Manufacturing Co.,Ltd.(THM) has two low-end models: Wave $\alpha$  and Wave Z. There are two things to be mentioned about Wave $\alpha$ . Firstly, Wave $\alpha$  is not an entirely new model but was created by using the engine and body of the existing models of Dream and Wave types, permitting a drastic reduction in the R&D cost. Secondly, Wave $\alpha$ , when it was released, did not contain Chinese parts but could realize a 30% reduction in the retail price. Its parts were purchased from Japanese suppliers in Thailand (80% in value) and from local suppliers (20% in value). THM also tested the Chinese parts which were adopted for Wave $\alpha$  in Vietnam, but none of these parts could meet THM's requirement in QCD.

The retail price of Wave Z is 10% lower than that of Wave $\alpha$ .The two models share the same basic product concept, but with Wave Z an open bid for the selection of suppliers was introduced for the first time by THM. Through the bidding process, competition among suppliers to win orders from THM became tougher as the price was the main criterion by which winners were chosen.

***Suppliers***

The cost reduction of Japanese part suppliers in Thailand was achieved mainly by scale merit under production expansion, but the effort of each supplier also contributed to it. There are two things suppliers can do to cut costs. Firstly, they try to improve production efficiency of workers and equipment because the reduction of material costs was very difficult. For example, suppliers made *value analysis* (VA) proposal that eliminated the loss in the metal pressing process. Secondly, suppliers which were allowed to work with assemblers on the "approval drawing" basis can strive for cost reduction in part design<sup>9</sup>. For example, suppliers proposed

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<sup>9</sup> When design work is split between assembler and supplier, the results are called "black box" parts and the drawing is called "approval drawing" in Japan (see, for example, Clark and Fujimoto (1991, pp.129-165)).

*value engineering* (VE) that decreased the material cost in manufacturing a tire by narrowing the tire width without compromising performance.

### ***Business Architecture***

Though the R&D ability of Japanese producers cannot be fully discussed here for the lack of space, it should be noted that the advancement of assemblers' R&D ability in Thailand was one of the factors behind cost reduction. Because assemblers could respond to suppliers' VA and VE proposals quickly and effectively, cost reduction was achieved locally and smoothly without time-consuming interaction with the headquarters in Japan. In fact, close cooperation between assemblers and suppliers as well as quick response to the cost-cutting pressure are the hallmark of the Japanese business model which place special emphasis on total quality. Japanese assemblers and suppliers work together from the initial R&D phase onward to achieve integrated balance in every aspect of motorcycle production. The actions taken by Japanese motorcycle producers in Thailand as shown above can be explained by the business architecture theory of Prof. Takahiro Fujimoto, a theory which generated many studies in the last few years (Fujimoto et. al. eds., 2001). Japanese producers consider the motorcycle as a *closed-integral* product. This permits them to develop and manufacture high quality motorcycles at low cost in the long run. This is in sharp contrast to Chinese motorcycles for which the product architecture is an *open-modular* type. By now the sales of motorcycles assembled from Chinese parts have dropped significantly in Southeast Asia. The product architecture of Japanese producers have not changed yet, but we should also note that the procurement structure of Japanese producers shifted partly toward a more open type as mentioned above, in response to the Chinese shock<sup>10</sup>.

## **6. Conclusion**

This paper examined the stages of localization, the procurement structure of Japanese producers, and the cost reduction process in Vietnam, Thailand and Indonesia. Before closing, measures to develop the motorcycle industry in Vietnam, a country with the youngest motorcycle industry among the three, can be presented.

A continued expansion of production volume is the premise for the healthy growth of the Vietnamese motorcycle industry. As Vietnam at present is in the early years of motorcycle industry development, the importance of production volume cannot be overemphasized.

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<sup>10</sup> Japanese producers still generally use custom-made parts, but they have begun to procure some custom-made parts from more suppliers, which are selected by open-bidding, than before. Therefore competition among suppliers for orders also became fiercer than before.



Assuming that this premise is met, there is a potential for the development of part suppliers in Vietnam. As larger production volume draws more suppliers to Vietnam, the stage of localization should progress from the second to the third stage. Over time, Japanese assemblers and suppliers are likely to let local suppliers take up some parts and production processes. As a consequence, the supporting industries in the true sense will begin to emerge. Under these circumstances, three promotion measures are proposed.

Firstly, what is most important for local suppliers in Vietnam is to establish the skill for mass production. Mass production includes not only large scale but also *ability to produce parts with uniformly high quality and guarantee stable supply flows*. Though it is important for suppliers to have classroom lectures, this skill should be acquired through the actual production process of a certain product because only then suppliers are pressed to solve daily operational problems and respond to assemblers' strict requirement for QCD. The ability to conduct R&D is surely important in the future (see below), but that is not what Japanese producers expect most from local manufacturers at present. For survival and competition in the increasingly open economy, the skill for mass production is far more crucial. This skill may appear easy to learn superficially, but it is in fact very difficult to master it completely. Even local suppliers in Thailand and Indonesia are far from learning it.

Secondly, as a next step, ability to *cut costs* while maintaining uniformly high quality is required for promising local suppliers in Vietnam. Localization in Vietnam is far behind that in Thailand and Indonesia. But the suppliers in Vietnam are pressed to assume the same active role as the suppliers in Thailand and Indonesia in order to enhance the competitiveness of the Vietnamese motorcycle industry as soon as possible. The case of Thailand indicates that it is very important for suppliers to improve their ability to make VA and VE proposals. From the viewpoint of business architecture, VA and VE proposals are essential for suppliers working with Japanese assemblers producers because these constitute the source of their competitiveness. To acquire VA and VE ability, daily efforts on the factory floor through learning by doing is highly important as in the case of mass production. Moreover, if local suppliers dispatch their engineers to assemblers in Vietnam or R&D centers in Thailand or Japan, they will learn even more.

Thirdly, as a final step toward the development of suppliers in Vietnam, R&D ability will be needed. Concretely, this means an ability to propose part designs to assemblers, which can be considered one type of ability to make VE proposals. But even the Japanese part suppliers operating in Thailand and Indonesia cannot do this in a satisfactory manner. This ability is not needed for local suppliers in Vietnam for now; it is a task for the future. Japanese suppliers in

Thailand and Indonesia have been accumulating production engineering skills required for this purpose steadily over time. While nowadays the R&D functions of Japanese assemblers are being transferred to Thailand, they are not transferred in its entirety; some functions still remain in Japan. But we should recall that even the ability acquired through the five stages of localization has enabled the Japanese assemblers and part suppliers in Thailand to develop Wavea in a relatively short time without Chinese parts.

The Vietnamese government should support these efforts by local producers, especially to achieve the first (mass production skill) and the second (VA and VE proposals) goals above. There are many things that can be done for this purpose. For example, the government can compile reliable local supplier directories, provide them and other related information to foreign assemblers, organize trade fairs, establish material and part testing centers, invite Japanese specialists, create standard subcontracting forms, introduce preventive measures to reduce delayed payments of assemblers to suppliers, and so on.

In Thailand and Indonesia, assemblers and suppliers are cooperating at present to invest aggressively in new equipment and expand their production capacity. Furthermore, the strong trend toward trade liberalization obliges lower tariffs on imported parts. Under these circumstances, foreign part suppliers have the options of investing in Vietnam and exporting parts to Vietnam from their existing production bases in Thailand or Indonesia. If Vietnam is to attract a large number of foreign suppliers and develop its supporting industries, its business and investment environment must continue to improve, and local suppliers need to acquire necessary skills as discussed above. While the motorcycle industry develops gradually and step by step, we should also realize that the time permitted for Vietnam to do so is much shorter than the time Thailand and Indonesia enjoyed in the early stages of their development.

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