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# THE ROLE OF ENTREPRENEURS IN THE DEVELOPMENT OF JAPANESE AUTOMOTIVE INDUSTRY

by

Lee, Duk-Hoon

## **Abstract**

This study reviews a primary factor for development of the late developed automobile kingdom, Japan which moved into the greatest automobile producing and exporting nation for a short time of merely about forty years. As the major reasons how Japan can become the world largest automobile production country, the distinctive entrepreneurship is pointed out with the governmental assist and the domestic market environment.

## **Key Words**

Automobile, Entrepreneurship, Japanese Automotive Industry, Nationalism, Innovation, Industrial Policy, Toyota, Honda, Governmental Assist, Domestic Market Condition

## **I. Introduction**

As the auto industry has a wide range of relative industries, its developing state can be regarded as the mirror measuring the industrial level in any country. An automobile which is a complicated product normally, comprises more than 30 thousand parts per one unit. Thus mass production of an automobile requires a wide range of skill and technique or various organization and technology. For these reasons, the automotive industry is called as the general industry. To the extent, we may say, that economic development of

the late developed industrial nation, Japan could not be achieved without the automotive industry, such automotive industry played a great role in the Japanese economic development.

According to the statistics of the Japanese Automobile Manufacturers Association for the year of 1991, the Japanese automotive industry holds the high ratio in the Japanese industry to become 12.9% of a total operation production and 17.8% of a total export amount (for the year of 1992). And to the extent that the number of employees for the automotive industry occupies 10.4% (6,520 thousand persons) of a total employees in all the industry (62,490 thousand persons), effects of the automotive industry to the Japanese economy are great. [1]

<Table 1> The Automobile Production Trend of Major Countries (unit : 000s)

	1930	1940	1950	1960	1970	1980	1989
USA (%)	3,356 (81.2)	4,513 (87.2)	8,006 (75.7)	7,905 (47.9)	8,248 (28.3)	8,010 (20.8)	10,852 (22.2)
UK	46 (1.1)	134 (2.6)	784 (7.4)	1,811 (11.0)	2,098 (7.2)	1,313 (3.4)	1,626 (3.3)
W.Germany	71 (1.7)	72 (1.4)	306 (2.9)	2,055 (12.5)	3,842 (13.1)	3,879 (10.1)	4,856 (9.9)
France	230 (5.6)	N/A N/A	358 (3.4)	1,369 (8.3)	2,750 (9.4)	3,842 (8.8)	3,920 (8.0)
Italy	46 (1.1)	49 (0.9)	128 (1.2)	645 (3.9)	1,854 (6.3)	1,610 (4.2)	2,221 (4.5)
Japan	0 (0.0)	38 (0.3)	32 (0.3)	482 (2.9)	5,289 (28.7)	11,043 (26.9)	13,026 (26.6)

source : Japanese Automobile Manufacturers Association, *Statistics of Automobile of Major Countries*, 1992.

note : (1) N/A=Not Available

(2) The sum of column percentage is not 100, since some countries, such as Canada, Sweden, Korea, etc., are not included.

Nations which produce the automobile among 160 numbers of nations in the world are about 30 ones. As of 1991, Japan which produces 13,260 thousand motor vehicles (28.4%) out of total automobiles, 46,720 thousand motor cars, produced in the world, is going ahead of other nations such as U. S. A. ranking the second (18.9%) and Germany ranking the third (10.8%). Like this, the greatest automobile producing nation, Japan also occupied 0.7% of a total production in the world by having produced nearly about 3,800 automobiles

forty years ago as it can be seen in Table 1.

In this article, we review, in the position of the underdeveloped nation, a primary factor for development and growth of the late developed automobile kingdom, Japan which moved into the greatest automobile producing and exporting nation for a short time of merely about forty years.

There are several kinds of study methods for the development of the automobile industry. In this article, however, we make researches of it laying stress of hard factor and soft factor. [2]

As for the hard factor, priority is given to the enterprise and government, and as for the soft factor, priority is given to the industrial policy. [3] The reason why the late developed nation, Japan grew up to become the greatest automobile kingdom in the world is guidance by the government, i.e. industrial policy as Halberstam indicated. [4] The Japanese industrial policy for the automotive industry departed from the protection of infant industries which can be the typical pattern of the late developed nation. In such, there are a policy for upbringing industries and a policy for regulating industries including establishment of safety standards and prevention of environmental pollution.

As you can see, in the beginning, as industrial policy centering around a nation played an important role in the development of the automotive industry of a late developed nation. However, there were few cases which the automotive industry achieved success with introduction of such industrial policy. [5] This example teaches us that "the institutional means" such as the government's industrial policy is important but "non-institutional means" such as entrepreneurial role (innovation) is more important than that.

At present, many developing countries try to learn the ways of development of the auto industry through the Japanese case. Few of them, however, pay attention to the Japanese distinctive entrepreneurship, which would be the major factor of the growth of Japanese auto industry.

Accordingly, we will discuss about this article centering around the soft factor, entrepreneurial role so as to understand the Japanese automotive industry in more detail. [6]

## **II. Specific Character for Growth of the Automotive Industry in Japan and Japanese Entrepreneurship**

The Japanese automotive industry is different from the Japanese key industries such as iron and steel, chemicals and heavy machinery in the following viewpoints. [7] First, the iron and steel industry developed centering around the

old financial cliques but the automotive industry grew up by means of entrepreneurial innovation by the founders of newly-rising financial group and the managements of the same family such as two and three generations of lineal relatives. [8] Second, unlike the iron and steel industry, the system such as "Just in Time" developed and settled down by conception of new Japanese system. This was achieved by entrepreneurial behavior rather than by the industrial policy. Finally, the late developed enterprise such as Honda or Toyogogyo other than the Japanese existing car makers (Toyota, Nissan) actively met with the environmental problem such as a revised bill of the atmosphere cleaning law.

The present article deals with the above mentioned three special features in connection with the entrepreneurship. In the meantime, it is important to consider as to what shall be the entrepreneurship and what shall be regarded as the entrepreneurial innovation. [9] Another important thing is the matter as to how such entrepreneurial innovation acted.

First of all, it is inevitably required to recognize that a concept "entrepreneur" is different from according to the situation and the times the entrepreneur faced with. [10] This is because that as Nakagawa indicated, essence of entrepreneurial function is different from one another in comparison with the modern advanced nation, the late developed nation and the Western countries during the nineteenth century. [11] The starting point of the late developed nation's industrialization differs greatly from the advanced nation's technical innovation which has already been developed and used. Also, it is impossible to explain that the most necessary function for the late developed nation's automotive industry is the frontiersman's innovation centering around "creative destruction". [12]

It is because that as for the automotive industry requiring a certain level of advanced technology, the late developed nation adapted the advanced nations' technology to its environment, maximized productivity and minimized costs per unit as such nation needs supplementary abilities for Leibenstein's gap and for input, in other words, "X-Efficiency". [13]

Supplementary abilities for such gap and input are classified into (1) innovation for enterprise's nationalism, (2) technical's innovation and (3) institutional innovation.

### **III. Innovation for Enterprise's Nationalism**

It was an industrialization time before or after the Meiji Restoration that

enterprise's nationalism or industrial nationalism appeared in Japan. The Japan during the Meiji days should take the policy for wealth and military power of a nation to break from the Western colony. To realize this, settlement of the existent non-economical values and formation of public benefit-centered values were needed. The element which merged the above mentioned two opposing object is the enterprise's nationalism. As regards the enterprise's nationalism, merger of Higashibadake's nationalism into industrialism as well as Hujimori's industrial spirit express well, and regard that this relates to modernization. [14]

Such enterprise's nationalism was sought by the founder of the Toyota Motor Co., Mr. Toyota Kiichiro. He devoted himself to the production of home-manufactured passenger cars using the Japanese brain and technology with the belief that domestic industries using the Japanese hands (manpower) shall be established and that making of home-manufactured passenger cars is my duty. Such Kiichiro's philosophy and thought can be found out from "Toyota general principles" which were his father's thinking method and life method as follows: [15]

- (1) To bear fruit for industrial patriotism by faithfully working without division between superiors and inferiors.
- (2) To be ahead of the times with intention for research and creation.

The above mentioned Toyota general principles are the basic ideology for the Toyota management and its ideology remains alive as the spiritual supporter of all the employee. The spirit of "industrial patriotism" was influenced by the national policy such as the policy for wealth and military power of a nation and the policy for industrial promotion. It means "recompense for a nation" by establishing industries, which would contribute toward a national benefit.

The enterprise's nationalism by Kiichiro is actually indicated in the following examples. In 1952, the Ministry of international Trade and Industry established a policy for introduction of foreign technology, and in accordance with such policy, Nissan Automobile technically tied up with Austin in England, Isuzu technically tied up with Rutz in England and Hino Automobile technically tied up with Renault in France to purchase parts and introduce technology. However, as can be seen in Table 2, Toyota Automobile did not receive the aid of foreigners then.

&lt;Table 2&gt; The State of Technical Cooperation with Foreign Auto Companies.

	Nissan	Hino Diesel	Isuzu	Mitsubishi
Affiliated Concern	Austin (UK)	Renault (France)	Rutz (UK)	Willis Overland (USA)
Introduced Technology	Engine (A-10)	Engine (A-4CV)	Engine (Hiruman Minks)	Jeep Manufacturing
Contract Term	7 years	7 years	5 years	5 years
Contract Date	Dec., 23, 1952.	Mar., 3, 1953.	Mar., 3, 1953.	Sep., 3, 1953.

President of Toyota Automobile, Mr. Ishida mentioned the following in the new year's compliments of 1953. [16] "I fell our responsibility and sense of duty for establishment of home-manufactured automobiles increase depending on the growth of foreign made automobiles. We have to make our way through the thorny thicket." This mention had all the employee fell the sense of duty which Toyota company must make home-manufactured automobiles and the sense of responsibility which Toyota company must not fall behind foreigner's automobiles despite that other Japanese automobile manufacturing companies are deluged with joint venture of foreigner's advanced technology. Such feeling made them work overtime.

As a result, delivery ceremony of Crown and Master designed with the Crown for taxi was held at the Toyota headquarter factory in 1955. The founder of Toyota completed to make completely home-manufactured passenger cars which he had dreamed of through seven teen years' efforts, since 1938 when the company was founded. In 1955, Toyota company produced 22,786 automobiles in total and of them, passenger cars were 7,403 Nos. Toyota actually did not fall behind Austin which produced 2,089 Nos, Hiruman which produced 2,031 Nos., and Renault which produced 3,180 Nos., then. (see Table 3)

<Table 3> The Production Trend of Automobile, Produced by Foreign Countries' Technical Assistance

	Nissan	Isuzu	Hino	Mitsubishi	Total
	Austin	Hiruman	Renault	Jeep	
1952	-	-	30	204	234
53	1,334	453	1,425	2,853	6,065
54	1,540	2,127	2,420	2,934	9,021
55	2,089	2,031	3,180	1,451	8,751
56	2,718	2,132	3,640	1,893	10,383
57	5,785	2,752	3,550	3,989	16,076
58	3,935	3,327	4,364	5,437	17,063
59	3,454	4,608	6,403	4,151	18,616
60		8,711	7,793	7,831	24,339
61		10,272	3,767	9,656	23,698
62		8,946	886	8,770	18,602
63		5,432	200	5,452	11,084
64		998		700	1,698
Total	20,855	51,789	37,661	55,325	165,603

source: Amagai Shogo, *The Historical Development of Japanese Automobile Industry*, Agishobo, 1984, p.136.

What the late developed nation independently make an effort in the under-developed industrial fields and thus succeeds in it become the way of rendering services toward the national benefit. Also, the enterprise's nationalism which and enterpriser intends to realize wishes through the success in the underdeveloped industry with great risk, was driving force for development of enterprise and industries.

It is impossible to launch industries merely with nationalism centering around a slogan such as habitual use of homemade products and boycott of foreign made products. It is thus difficult to anticipate the development of the late developed nation's automotive industry without "innovation for the enterprise's nationalism" which made one devote one's life with the thought which industrial development leads to the national development.

#### IV. Techno-centered Entrepreneurship (Ichi Nin-Ichi Gyo Seishin)

"Made in America" of Massachusetts Institute of Technology, recently attracting public attention stated that prosperity of one nation is related to its excellent productive capacity, and analyzed decline of U.S.A. based on its



productive capacity.

The productive capacity herein involves close relationship with technical power. In explaining backgrounds for the growth of the Japanese automotive industry, "one person one industry spirit", which the Japanese enterpriser has, cannot be excepted. "One person one industry spirit" means that one person devotes his or her life to one industry. Further, it means that he or she raises up one industry. [17] Really, Japanese have a virtue for a master who devotes himself or herself to one field.

With Mr. Honda Soichiro of Honda Motor company, who is called as the pronoun of innovation in the Japanese automotive industry, as the central figure, we study "one person one industry spirit" in the following.

Mr. Soichiro established the Honda Technology Institute in 1946 and started a business for making and auxiliary engine for motorbike. This company had no technology other than Mr. Soichiro's individual technology. Mr. Soichiro spoke reminiscently then the situation as follows. "At that time, there were no home-manufactured vehicles and thus I should made the whole parts by myself since there were no parts other than imported ones. I made from a lathe to fender and even performed painting by myself."

At the time when the Honda Technology Institute was established, there were more than sixty companies having motorcycle business in Japan. The Honda institute was not in the position of pioneer. It took part in a through process of an engine and chassis in 1949 and succeeded in the development of Dream-E via four-cycle engine. By manufacturing new kinds of motorcycle loading such engine on emergency demands due to the outbreak of the Korean War, new growth was achieved.

As more that sixty minor enterprises were flooded with such business, all the products made by these enterprises fell behind the advanced nation's products in performance thereof. Accordingly, the industry anticipated the government's policy for the prevention of import and the upbringing, but the Honda did not go along with the industry and consistently followed the technology-centered policy.

From 1951, the Honda established a basic policy, "mass production of vehicles with the international level of quality performance born from modernized production method" unlike the other enterprises, and purchased the ultramodern machinery and tools in the amount of more that four hundred million Yen from the Western countries around from 1953.

Since Honda's capital was 15 million Yen, it was an adventurous undertaking which could not realize without techno-centered enterpriser's spirit, as an

enormous investment for expansion of production system and reinforcement of competition power in spite of difficult securing of funds during economic depression.

By selling Dream 3500cc in 1955, a two-cylindered fan shape in 1957 and the greatest supercurve of 50cc in 1958, the Honda raised its stock price. By participating in the TT race in 1959 and winning the title in 1961, it gained a world-famous position in the respect of performance.

It was not easy to get to the summit of the industry merely within ten years. Opportunity that made the Honda actually grow up to the world-famous enterprise was the TT race. The Honda Motor company stood any kind of trials until it won the title in the race. In 1953, Mr. Soichiro paid a visit to the United States to watch the TT race. Watching in the actual race the advanced nations' motorcycle running at full speed, he fell into agony waking up to the realization of the fact that their motorcycles are a stroke above the Japanese ones in performance, element, etc. Mr. Soichiro, after returning to his country, used all his efforts in improving the performance of products through the technical development by investing all the funds and manpower. Competing with other enterprisers in the same industry, the Honda Motor company invested the costs corresponding to 3% of total sales and manpower corresponding to 10% of all the employees for the research of technology. It was the investment which then the motorcycle industry could not even imagine.

The reason why the Honda Technology Institute swept over the motorcycle industry is that there was techno-centered entrepreneurship laying stress on technology than on interests as well as "conception jumping over common sense".

The Honda Motor company was not contented with its position and advanced into the four-wheel passenger cars in 1963. After initially taking part in the FI race of the four-wheel vehicles in 1964, the Honda won the title in the Mexico grand prize the next year. In the speed race, a high-degree engine technology is necessary and thus, Honda accumulated the technology using the opportunity and made rapid progress in the four-wheel vehicles. After a light car N360 was put on the market in 1967, it became the best seller within three months of the sale and continuously grew up to set a record of 87 thousand cars in sale. (see Table 4)

With the continuous development of technology, the Honda Motor company developed the CVCC (Compound Vortex Controlled Combustion) engine in the beginning of 1970, which contributed toward the technical development of the international automotive industry. In the United States which were a suzerain

&lt;Table 4&gt; The Annual Automobile Production of the Three Motor Companies

	Toyota	Nissan	Honda	% of Honda/Toyota
1963	128,843	118,558	136	0.01
64	181,783	168,674	5,210	2.87
65	236,151	169,815	8,779	3.71
66	316,189	231,508	3,209	1.01
67	476,807	352,045	87,169	18.28
68	659,189	571,614	186,570	28.30
69	964,088	697,691	232,704	24.13
70	1,068,321	899,008	276,884	25.90
71	1,400,186	1,101,506	215,256	15.40
72	1,487,661	1,352,251	235,248	15.80
73	1,631,940	1,487,360	256,962	15.74
74	1,484,737	1,255,669	316,012	21.30
75	1,714,836	1,532,731	328,107	19.13
76	1,730,767	1,616,319	473,597	27.40
77	1,884,260	1,615,886	576,631	30.60
78	2,039,115	1,733,132	652,920	32.00
79	2,111,302	1,738,946	706,375	33.50

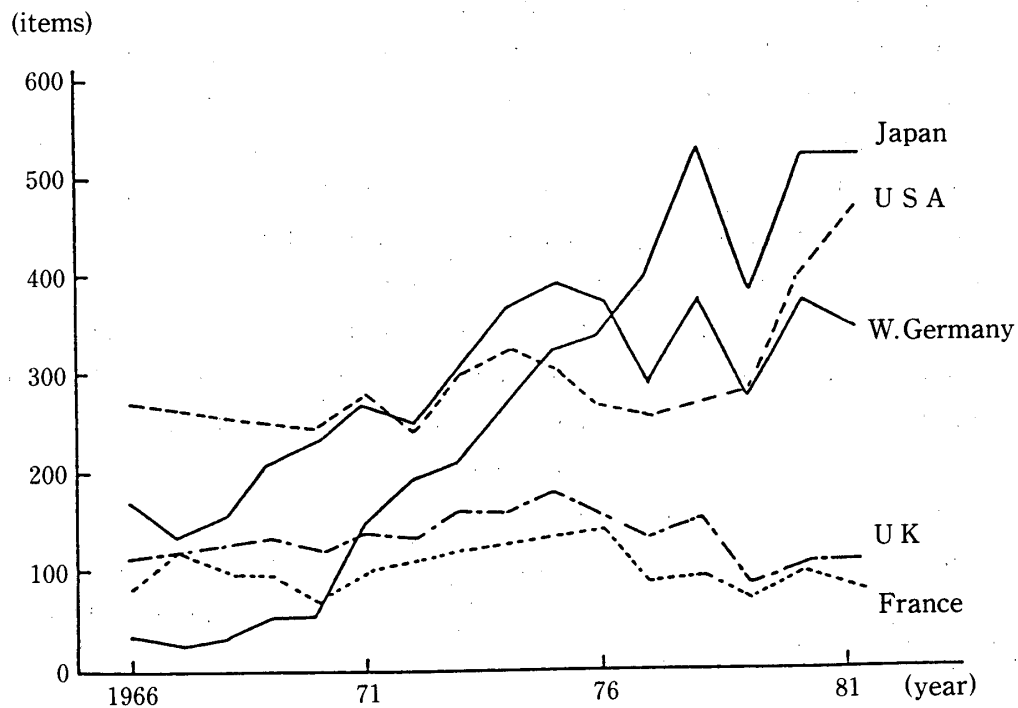
source : Internal Data of the Japanese Automobile Manufacturers Association.

of then the automotive industry, the Clean Air Act called as Muskie Act was enacted and thus the automotive industries paid attention to the development of the low environmental pollution automobiles. While most of enterprises were preparing against exhaust gas control by way of post-treatment such as catalyst converter, Honda jumped in the reduction of a pollutant (CO, HC, NOX) by improving the engine itself. As the result of continuous research, the Honda Motor Co. succeeded in developing the CVCC engine. Honda put 1000cc-grade Civic equipped with the CVCC engine on the market in 1972 and this car was successively selected as "car of the year" in Japan for three years from 1972. Further, the Civic was selected as "car of the year" in the United State in 1974, too, thereby making a rapid progress.

Furthermore, then the large three automotive makers in the United States were filling the argument which enforcement of the Muskie Act is technically impossible, to the Environment Administration, and for the reason, the Honda's development of the CVCC engine startled the automotive industries all over the world and led to the technical progress of automotive manufacture. It can be said that such progress can only be made with "techno-centered one person one industry spirit" which Mr. Honda Soichiro had, rather than thinking only of the immediate profit. [18]

Figure 1 shows that as the number of patent cases acquired by each country in the United States, the technical level of the Japanese automotive industry is rapidly increasing. By early 1970's, the number of patent cases acquired by Japan was less than 100. That is, Japan fell behind the United States or Germany. However, Japan exceeds 300 cases in 1976 and continuously holds the first rank of patent cases after that.

<Figure 1> The Number of Acquisition items of Patent in America



Source : Domizawa Gonomi, *The Changing Automobile Industry*, Sogogenkyusho, 1986, p.59.

It can be said that such technical development reflected the techno-centered enterprise's feature which the Japanese enterprise has, in contrast the United States' enterprises having financial control-centered management.

## V. Institutional Innovation By a Supervision Enterpriser

The automotive production system of the United States called as the automotive kingdom was developed with mass production system, but the Japanese automotive production system was developed with "a small quantity having a

lots of models" type which called as Toyota production system or "a ganban system". [19] The Toyota system necessitates the two important constituents, "Just in time" and "Jidoka", and this system was the production method obtained through long-term trial and error. Mr. Onodaichi's basic idea which is the father of Toyota production method was that the former manufacturing process should relay what is required for the latter manufacturing progress to the extent of the required quantity at the required time point.

During Japanese postwar rehabilitation, domestic demand of passenger cars did not reach to the mass production scale. Despite that, mass production system like the U. S. production style was introduced. This resulted in over production for the Japanese auto industry. For example, the Toyota Auto company, after the Second World War, produced 1,000 vehicles in a month, which were the production before the war, but many of them were not sold and thus it had lots of stock on hand. Accordingly, the Japanese auto industry thought and thought about preparation of the measures for solving the problems of waste in manpower and materials arising from overproduction. [20]

As it can be seen in Table 5, the Toyota Motor company produced 14,228 motor vehicles including 12,392 trucks, 130 special automobiles, 1,399 passenger cars and 299 buses in 1951. This illustrates that The Toyota took the diversified production strategy in order to cope with overproduction. Therefore, while American management concentrated on how to cut down the production costs under the mass production system, Japanese entrepreneurs had to find out the way of reducing production costs under the small quantity production system, which produces a lots of models.

&lt;Table 5&gt; The Production Trend of Motor Vehicle of The Toyota Motor Co.

Year	Annual Total	Truck		special auto-mobile	Passenger Car		Bus	Cumulative Total
		Large	Small		Large	Small		
1938	4,615	3,719			539		357	9,790
39	11,981	10,913			107		961	21,771
40	14,787	13,574			268		945	36,558
41	14,611	14,331			208		72	51,169
42	16,302	16,261			41			67,471
43	9,827	9,739		35	53			77,298
44	12,720	12,533		168	19			90,018
45	3,275	3,275						93,293
46	5,821	5,821						99,114
47	3,922	3,768	100		50	4		103,036
48	6,703	6,021	670		3	18		109,739
49	10,824	7,540	2,845			235	204	120,563
50	11,706	7,300	3,714			463	229	132,269
51	14,228	8,552	3,840	130		1,399	307	146,497
52	14,106	6,423	4,950	415		1,857	461	160,603
53	16,496	6,162	4,516	1,744		3,572	502	177,099
54	22,713	8,603	8,434	1,085		4,235	356	199,821
55	22,786	5,310	9,184	720		7,403	169	222,598

source : Internal Data of Toyota Automobile Manufacturing Association

On top of the above solution, Mr. Onodaiichi established the following three production principles saying that "to make what is not being used now leading to increase of the stock is the only waste, that is, all the machines and manpower are wasted, and the stock let money lie asleep". [21]

First, defective parts or article should not be sent to the latter manufacturing process. Second, complete parts or articles from the former process are received by the latter process. Third, the former process produces the quantity to be received by the latter process. Especially, to perform the third production principle, the regulations that all the parts shall be attached with a label (so called a "ganban"), and that any part without the label shall not be accepted, shall be estimated and strictly observed, in order to prevent any trouble between each manufacturing process.

Such "Just in time" production system enabled to minimize the stock quantity and to easily control the production method under each manufacturing process to the optimum condition. In other words, it enabled to "supervise with eyes" as to what is normal, abnormal, waste or effective so that everybody can see it at a glance.

“Supervision with eyes” has basic thought of immediately settling any abnormal state or defective state arised, on the spot. [22] For example, in case of mass production system of the United States, stopping the line cannot be accepted by the management and the field supervisor even though some defects arise. However, Mr. Onodaiichi totally denies such thinking method. He argues that every body can establish the line if any problem arise in the production process. Not to stop the line and to continue production in spite of problems, mean to continuously produce defects. Accordingly, such problems shall be solved by immediately stopping production of the line in spite of temporary damage.

It can be said that productive thought and technology conceived through the Japanese wisdom and experiences are the Toyota production system. Then, how could such thought be conceived? To this question, Mr. Onodaiichi replied as follows. “I thought not only development of Toyota company but also that of the Japanese auto industry is possible by way of following the production method of the United States having about ten times of factory productivity. When Japan was defeated in the Second World war, I thought a similar thing to the original pattern of the present Toyota production system. Accordingly, if then the Toyota company introduced this system and fail, other Japanese automobile companies would be ruined. However I thought not only Toyota company but also the Japanese auto industry would developed if this system succeed”. [23] As you can see, Mr. Onodaiichi thought that the Japanese auto industry would survive by making the structure which works to be done by ten persons of Amerian can be done by one person of Japanese, if the gap of industrial productivity between Japan and America is ten times.

The Toyota system which departed depending upon only manpower resources existent in spite of the funds difficulties and the facilities difficulties during the postwar rehabilitation times, was maintained and developed by wisdom of the field laborers with their teamwork. Since the suggestion system was introduced in 1951, one million items have been suggested until 1974. Recently the cumulative total items were reached to 15,444,140 in 1992, and 99 per cent of the suggestions were accepted by the management. Surprisingly, 26.1 items have been suggested for each employee in the Toyota Motor company. [24]

This Toyota production system was applied to the point venture of Toyota company and GM company, the New United Motor Manufacturing Incorporate, leading to a remarkable growth. [25] Consequently, the Toyota production system was propagated all over the world including the U. S. A.

## VI. Conclusion

The Japanese automotive industry made a remarkable growth to become the greatest production country both in name and reality by recording 11,040 thousand Nos. of vehicles corresponding to 28.7% of the world production quantity in 1980 in comparison with 38,000 Nos. of vehicles corresponding to 0.7% of the world production quantity in 1940.

This study has concerned to find out major reasons how Japan can become the world largest automobile production country.

Most of the empirical studies focuses mainly on the industrial policy of the Japanese government, so called 'guidance by government', in order to discuss the growth of Japanese auto industry. This analysis, however, lays stress on the somewhat different factors, such as, innovation for enterprise's nationalism, technical's innovation and institutional innovation.

While, in many late developed countries' cases, the government plays a leading role for developing an auto industry, few cases have been succeeded so far. As this evidence illustrates, it can be argued that in order to develop an auto industry, it is necessary not only the governmental assist but also the entrepreneurs' effort including some kind of revolutionary spirit.

Meanwhile, the extremely competitive market condition can be pointed out as another source for explaining the success of Japanese auto industry. (see in Table 6)

As it can be seen in the above table, nine motor companies competed with each other for sharing the domestic market, which is about half size of American auto market in the 1960s. The degree of convergence of automobile production among the motor companies in Japan is relatively lower than those of the Western countries. While the two largest Japanese companies accounted for 55.5 per cent of the car production in 1980, in the case of American, French, British and Germany, the two largest companies commanded an overwhelming majority in their countries' automobile production.



&lt;Table 6&gt; The automobile production trend of individual company in Japan.

(unit : %)

Company/Year	1968	70	72	74	76	78	80
1. Toyota	32.1	33.6	37.0	37.8	34.4	34.1	32.7
2. Nissan	27.8	28.3	33.6	31.9	32.0	29.0	27.6
3. Honda	9.1	8.7	5.8	8.0	9.4	10.9	12.0
4. Toyogogyo	8.7	7.1	9.4	9.6	8.9	8.2	10.5
5. Mitsubishi	6.3	7.7	5.5	5.9	8.0	10.2	9.4
6. Fuji	5.1	5.0	3.2	2.6	3.1	2.3	2.9
7. Daihatsu	4.3	4.5	2.7	2.0	1.4	2.1	2.2
8. Isuzu	1.9	0.6	0.3	0.7	1.8	1.7	1.5
9. Suzuki	4.7	4.6	2.2	1.4	0.9	1.0	1.2

Source : Japanese Automobile Manufacturers Association, 'Automobile Statistical year Book' 1992.

Consequently, the high competitiveness has promoted the management's effort to reducing production cost, developing new models and expending export. Further the competitiveness brought about a systematic abandonment, which reduces the product life cycle efficiently. [26] In order to survive, the small motor companies was at the head of the improving production technologies. For example, Honda and Toyogogyo developed 'CVCC' and 'Rotary' type engine respectively far in advance of others, when the exhaust fumes constituted a public problem.

On top of the market condition, the development of such automotive industry was caused also by the techno-centered entrepreneurial spirit which technical improvement through investment of facilities rather than interests is required for the development of the enterprises and industry, and by the innovative spirit for enterprise's nationalism which such technical development contributes toward the development of a nation.

Really, enterprisers such as Mr. Toyota Kiichiro who made a challenge to the manufacture of homemade passenger cars as an enterpriser of Toyota company having enterprise nationalism, Mr. Honda Soichiro who made a challenge to the development of new engine as the late developed enterprise and Mr. Onodaiichi who denied the mass production system of the United States and developed the Toyota production system of the small quantity with lots of sorts, spared no investment of facilities to make the techno-centered enterprise climate, and created the competitive market which is continuously challengeable against difficulties.

Their characteristics were in that they thought their individual interests to be

a byproduct as the enterpriser of communities laying stress on the development of enterprises rather than on the individual development. Accordingly, their architectural and revolutionary innovation was possible, and niche creation was possible as well. [27]

Of course, revolutionary and architectural innovation would have been impossible without institutional innovation of the supervising enterpriser. Such entrepreneurship was not achieved at its own discretion but achieved for the mutual compromise.

In conclusion, as the major reasons how Japan can become the world largest automobile production country, the distinctive entrepreneurship and the domestic market environment might be pointed out with the governmental assist.

### \* Notes And References

- [1] Japanese Automobile manufacturers Association, *A Statistical Yearbook*, No.20, 1992.
- [2] In this study, While the hard factor means institutional and systematical devices that can be transferred to foreign countries, the soft factor stands for the socio-cultural factors that is not transferable.
- [3] David Halberstam, *The Reckoning*, Japanese Broadcasting Press, 1987.
- [4] The industrial policy in Japan, that is called as 'Japan Inc.', stands for a close connection between the government and companies, and it is emerged in other industries such as steel, semiconductor, etc.
- [5] Duk-Hoon. Lee, "The Growth of Enterprises & Industrial Policy in Japanese Auto Industry", *Mita Business Review*, Vol.36, No.3, Keio University, 1993.
- [6] Duk-Hoon. Lee, "Japanese Style of Industrial Society ( I )", *Journal of Social Science*, Vol. 2, Social Science Institute, Hannam University, 1993, p.87-103. And Duk-Hoon. Lee, "Japanese Style of Industrial Society ( II )", *Economic Studies*, Vol. 3, Economic Research Center, Hannam University, 1994.
- [7] Of course, Japanese entrepreneurship is existed not only in the auto industry but also in steel, electric home appliance and semiconductor industries. Among these industries, the auto industry is selected in this study, since its scale of overseas investment and export performance is relatively large, and its management and production system is widely diffused over the world.

- [8] Duk-Hoon. Lee, "A Study of The Entrepreneurship in the postwar Japanese steel Industry", *Industrial Management & Accounting* (Sangyo Keiri), Vol. 51, No. 4, Japan Industrial Management & Accounting Institute, 1992.
- [9] In explaining the specific characteristics of Japanese enterprisers in the auto industry, this study includes the following three studies which defined the innovative entrepreneurship;
- (1) Shimizu Ryuei defined the term of entrepreneurship as an ability to produce discontinuous tension, to cope with unstable business environment and to decide an innovation which makes a challenge at risk. Refer to Shimizu Ryuei, *A Study of Management Capability*, Senseo shobo, 1987, pp. 74-75.
  - (2) F. Redlich classified the enterpriser's activities as follows ; ①Genuine Innovation, ②Re-Innovation, ③Derivation, ④Copying and ⑤Routine, Refer to F. Redlich, "Innovation in Business : A Systematic Presentation", *American Journal of Economic & Sociology*, Vol. 10, No. 3, 1951, pp. 285-291.
  - (3) The innovation was defined by A.H. Cole as the integrated sequence of action of management under the situation of uncertainly. Refer to A. H. Cole, *Business Enterprise in its Social Setting*, Harvard University Press : Cambridge, 1971, pp. 3-28.
- [10] Duk-Hoon. Lee, "Industrial Development & Entrepreneurial Activity - Focusing on Japanese Industrialization", *Mita Business Review*, Vol. 35, No. 4, KEIO University 1992.
- [11] Nakagawa Keiichiro, *An Introduction of Corporative Management*, Tokyo University Press, 1986.
- [12] On top of the frontiersman's innovation, entrepreneur's innovation would be more important.
- [13] H. Leibenstein, entrepreneurship & development, A. E. R., May, 1968, pp. 72-83.
- [14] (1) Higashibadake Shoichi, *The Formation of Japanese Capitalism*, Iwanamishinsho, 1967, pp.91-106. (2) Fujimori Mitsuo and Fukuzawa Yukichi, "The Spirit of Welfare and Business", *Mita Business Review*, Vol. 35, No. 5, 1989, pp. 75-88. (3) Duk-Hoon. Lee, "Japanese Modernization & Entrepreneurship-Focusing on Business", *Economic Studies*, Vol. 2, Economic Research Center, Hannam University, 1993.
- [15] Sato Yoshinobu, *The Strategy and Practical Analysis of Toyota Group*, Sidomomoshobo, 1989, pp. 20-21.
- [16] Kimoto Saeichi, *A Maze of Rebellion-A Novel of Toyota Kiichiro*, Mainichi,

- 1968, pp. 306-308.
- [17] Duk-Hoon. Lee, op. cit., 1994.
- [18] M. L. Dertouzos, R. Lester and R. Solow, *Made In America*, MIT Commission on industrial productivity, Haper Perennial, 1990, p. 175.
- [19] Ohno Daizi, *The Toyota Production Method*, Daiamondosha, 1978.
- [20] Duk-Hoon. Lee, op. cit., 1994.
- [21] F. Wakayama and T. Sugimoto, *The Secret of Toyota*, Koshobo, 1977, pp. 65-66.
- [22] The stop buttons are attached on every production equipments in the Toyota Motor company, and thus whenever workers feel the production process is unusual, they can push the button to stop the production line. And then the defeated production lines and machines are displayed on an electric sign board. The electric sign board is called "Andon".
- [23] Noguchi Hisashi, *A Man Who Designed Toyota Production Method*, TBS Britannica, 1988, pp. 264-265.
- [24] Duk-Hoon. Lee, op. cit., 1994.
- [25] In order to accustomed with the Toyota production system, the New United Motor Manufacturing Inc. ( NUMMI ) sent group leaders to the Toyota, and the Toyota also sent 200 instructors to the NUMMI. Source : P. R. Thompson, The NUMMI Production System, in P.R. Thompson (ed.), *America Production & Inventory Control Society*, 1986 Conference Proceedings, pp. 399-402.
- [26] Peter F. Drucker, *Managing for The Future*, Truman Tally Books : Dutton, 1992, pp. 177-183.
- [27] W. Abernathy, K. Clark, "Innovation : Mapping the Winds of Creative Destruction", *Research Policy*, Vol. 14, 1985, Feb., p. 8.