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(出版者 / Publisher)

法政大学比較経済研究所 / Institute of Comparative Economic Studies, Hosei University

(雑誌名 / Journal or Publication Title)

Journal of International Economic Studies

(巻 / Volume)

6

(開始ページ / Start Page)

80

(終了ページ / End Page)

99

(発行年 / Year)

1992-03

(URL)

<https://doi.org/10.15002/00002094>

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This paper explains the process of internationalization and local plant management of Toyota Motor Corporation based on field research. Toyota is very reluctant and prudent in decision making concerning overseas ventures, comparing with the other major Japanese automobile firms. Toyota lagged behind them in making inroads into developed countries, by choosing exports of finished products instead of risky local production. What stimulated a change of the strategy from exports to production in developed countries was a restriction of export volume to the U. S., due to the voluntary exports restriction. In spite of reluctance in going abroad, it applies the unique production system, known as Toyota production system very positively at local plants.

The way of application is not total but selective, because of different managerial environments from Japan. I visited four local plants, in North America and Taiwan, built in 1980s, where I conducted interviews with managers and plant tours. The Japanese production system requires flexible work organization, harmonious labor relations as well as positive worker's involvement in work. An appropriate organization is needed to implement those elements of the system. Even though managerial environments are not supportive to Japanese firms in North America due to a tradition of Fordism, Toyota applies its unique production system successfully. And in Taiwan, where environments are more agreeable with a Japanese system, Toyota also applies it with positive results.

1. Introduction

The main subject of this paper is to analyze and explain the specific feature of overseas production activities of Toyota Motor Corporation (hereafter Toyota), based on our field research¹⁾. There are two main reasons why I chose the company here. First, it relates to our theoretical framework of research. Professor M. Trevor has already defined Japanese multinational as "Reluctant Multinationals" (Trevor, 1983). He explained that Japanese enterprises were reluctant to enter overseas production activities and to delegate power of plant operation to local managers. We agreed with his explanation for the Japanese multinationals. The central concern of our research is that Japanese enterprises should apply Japanese-style management or production system in order to retain a competitive advantage at local plants, in one sense, yet should adapt themselves to local managerial environments, in another sense²⁾. In other words, it is imperative for Japanese firms to apply the Japanese production system at overseas plants, however, as a strategy, they should choose to what extent and how to apply it after considering specific managerial environments. We presumed that the application and adaptation would possibly fall into dilemma, so have named it as a "Application-Adaptation Dilemma Model". Given the model,

Toyota was the most reluctant among the major companies regarding overseas production. We can call Toyota as a typical “reluctant multinational” in this sense. Second, however, four overseas plants of Toyota which we visited have applied the Japanese-style production system most positively among Japanese-affiliated plants, even though it started local production relatively late, and it exhibited a new type of application of the production system which is representative of revised application on account of local managerial environments. Toyota should be taken into special account owing to those two reasons.

I explain the process of initiating overseas production in chapter 2. On checking the ongoing process which ranged from export of finished cars, to conducting knockdown production in developing countries, to a local production in developed countries, and to setting up regional headquarters, Toyota was behind Nissan and Honda after the local production in developing countries within the above sequential process. In chapter 3 comes an explanation for the situation of application of the Japanese-style production system for four plants which Toyota started in North America and Taiwan in 1980s, based on our field research. At first, I will supply an overview of the general situation of the application according to our evaluation model, and ascertain whether the system has been applied positively. Then I explain concretely how they apply it for some specific elements. In the final chapter 4, I would like to sum up main issue of this paper and give an inferential comment.

2. A process of going abroad of Toyota Motor Corporation

I would like to explain a process of an advance into foreign countries by Toyota. The process by which Japanese automobile companies took on overseas operations developed from (1) an export of finished cars to (2) a local production in developing countries and to (3) a local production in developed countries. Although the process followed after the technological growth in both research and development and manufacturing, each Japanese automobile company hesitated to make inroads into developed countries because each was dependent on a unique production system supporting international competitiveness through export. Toyota was, in particular, much more reluctant to embark on production activities in developed countries than Nissan and Honda, sticking to export of finished cars produced at home.

Therefore, I observe the local production in developing countries at first. They enjoyed producing automobiles in such countries for about 20 years before starting production in developed countries. Though being a production activity, it was conducted though a form of knockdown assembly, which had a character somewhat between export and production³⁾. The knockdown assembly started from exporting almost all component parts which were knocked down at the home country and assembled locally. Content of parts supplied locally was increased gradually, depending on the ability of parts makers there to provide what was needed. Automobile companies adopted this sort of system as an alternative to export of finished cars, when those countries resorted to embargoes or restrictions on car imports, or raised tariff barriers against foreign cars⁴⁾.

Although automobile companies must be content with the limitations in an indepen-

dent operation due to promotional policy on behalf of local capitalists by governments and with difficulty in achieving scale merit due to small scale markets, there is some merit for knockdown assembly in those countries. Because government protects the home market against foreign competition, companies producing there can get a kind of monopolistic profit.

According to the table 1, Toyota started its first overseas production in Brazil in 1959 and Nissan did in Taiwan in the same year. I do not notice any distinguished differences between Toyota and Nissan regarding to countries and years. As the form of entry (Wholly-owned, Joint Venture, and Licensing) is mainly determined by local government policy, both companies have almost the same form in the same type of region. On the other hand, Honda started its overseas automobile production in Taiwan in 1969, being behind Toyota and Nissan. Honda started business as a manufacturer of motor cycles, so it was late in entry into automobile production. It was a specific feature for Honda to make inroads into both developing and developed countries at the same time in the 1980s.

Now look to the production in developed countries. Nissan and Honda are distinguished in advancement of overseas production. As for the U.S., Honda was the front runner among companies who embarked on the local production. It started producing motor cycles in 1979, and automobiles in 1982. After starting to produce automobiles, Honda expanded its operation very smoothly and began to produce automobiles in Canada in 1986. Honda stands first in production volume among Japanese-affiliated companies in North America. Nissan began to internationalize production activities rapidly in 1980s, especially in advanced nations. It started independent operation in the U.S. in 1983 and is now under expanding capacity (Abo, 1990).

In contrast to those, Toyota was very reluctant in going to the U.S. At first it chose to enter into a joint venture with General Motors that did not include independent operation. This choice seemed just like Toyota, which is always prudent. Eventually it started its independent operation in the U.S. and Canada in 1988. It now has three plants in North America, and has plans to expand capacities or set up another plant close to existing plants. Because of potential ability to produce, it is recovering from its backwardness there.

Reluctance in making inroads into Europe is also distinctive of Toyota. Each auto company tried to find a way of local production in Europe in the latter half of 1980s, because of probable continuation of import restrictions after 1992. Three Japanese companies are producing cars in Europe, including trucks. Another four companies announced plans to make plants there and are building plants or searching for locations. Nissan was the first to start independent operation there. It took an active attitude toward making an inroad into Europe and set up an automobile plant in UK, after making a licensing agreement in Greece and joint venture in Spain. In UK, it started operation in 1986 and now expanding capacity. Honda has promoted a licensing agreement, cooperative research and development of a new automobile with an English company since 1979, but it needed much time to build a manufacturing plant there due to the focus its efforts on plant operation in the U.S. In 1989, Honda declared an agreement of joint venture with the English company. The plant are under construction for beginning of operation in 1992.

Toyota, at first, agreed to a joint truck production with a German company and started production in Germany 1989. There is also the truck production through

Table 1. Start up of Overseas Production Plants of Three Japanese Automobile Firms by Country

	Toyota			Nissan			Honda		
	Year	Entry Form	Product	Year	Entry Form	Product	Year	Entry Form	Product
USA	1984	J V	C&T	1983	WO	C&T	1982	WO	C
	1988	WO	C						
Canada	1988	WO	C				1986	WO	C
UK	1992	WO	C	1986	WO	C	1981, 92	LJV	C
Germany	1989	L	T						
Spain				1983	J V	T			
Portugal	1968	J V	T	1968	L	T			
Greece				1980	L	C&T			
Mexico				1966	WO	C&T			
Brazil	1959	J V	T						
Venezuela	1981	J V	C&T						
Peru	1967	J V	C&T	1966	J V	C&T			
Uruguay	1985	L	C&T						
Ecuador	1986	L	T	1987	L	T			
T. & Tobago	1971	L	C&T	1970	L	C&T			
Kenya	1977	L	C&T	1978	L	C&T	1986	L	C
Zambia	1983	L	T						
S. Africa	1962	L	C&T	1963	L	C&T	1981	L	C
Zimbabwe	1981	L	C&T	1981	L	C&T			
Iran				1984	L	T			
Australia	1963	J V	C	1976	WO	C			
New Zealand	1967	WO	C&T	1976	WO	C&T	1988	WO	C
Taiwan	1988	J V	C&T	1959	J V	C&T	1969	J V	C
Korea				1987	L	T			
Malaysia	1968	L	C&T	1976	L	C&T	1983	J V	C
Philippines	1989	J V	C&T	1971	J V	C&T	1992	J V	C
Indonesia	1970	J V	C&T	1982	L	C	1984	L	C
Thailand	1964	J V	C&T	1962	J V	C&T	1984	J V	C
India	1985	J V	T	1985	J V	T			
Bangladesh	1985	L	T						

Source : Toyota Motor Corp. (ed.) (1990), *General View of Automobile Industry*.

Nissan Motor Co. Ltd. (ed.) (1990), *Globalization of Nissan Motor Co.*

Sangyo Journal (ed.) (1990), *Real Situation of Toyota Motor Group*. IRC.

Sangyo Journal (ed.) (1990), *Real Situation of Nissan Motor Group*. IRC.

Sangyo Journal (ed.) (1991), *Real Situation of Honda-Giken, Honda-Gijyutu-Kenkyusho Group*. IRC.

Notes : 1) 'WO' means Wholly-Owned.

'J V' means Joint Venture which includes equity joint venture and excludes contractual joint venture.

'L' means Licensing.

'C' means Passenger Car and 'T' means Truck.

2) The table shows plants which produce automobiles and trucks.

licensing in Portugal. In 1989, Toyota formally announced an independent operation in UK. The capability for engine production was intended from the beginning. Both an assembly and an engine plants are under construction to begin production in 1992.

Next, I would like to explain the Toyota organization which controls overseas activities. After World War II, Toyota had created a separate sales division during a management crisis in order to reconstruct it. After that, both the Toyota Motor Co. (TMC) and the Toyota Motor Sales Co. (TMSC) had engaged in overseas production activities, though TMSC had managed exports mainly. TMSC had taken part in negotiation with the government in the process of changing from exports to knock-down assembly. They said that TMSC had had charge of plant operation due to the small scale of production in some cases. Of course, TMC had supported the local plants operation through setting a special division and section for it. The two companies merged in 1982, after a 32-year separation. The company history reports as follow: "To develop their international operations and to make decisions more quickly, however, a need had emerged to integrate the functions of both companies and restructure the new organization"⁵. So internationalization stimulated the merger. However, the reluctance of Toyota continues now. Though both Nissan and Honda have set up regional headquarters in North America and Europe, Toyota has not seemed to take a step towards it.

In Toyota, overseas activities are controlled by several Departments including the Overseas Operations Department of the headquarters in Japan. As a matter of fact, the regional headquarters of Nissan and Honda are in charge of adjustment of managerial matters among the related companies located within the same region rather than functioning as real regional headquarters. Even though Japanese headquarters of the two companies seem still to play decisive roles in managing overseas activities, they have taken a step to prepare for further globalization. Toyota should come to grips with organizational measures for globalization in the near future.

Toyota was reluctant to set about local production in developed countries, comparing with Nissan and Honda. Because Toyota had stuck to the home market and avoided such a risky business as production in developed nations. It was behind not only in local production but also in setting up regional headquarters. Of course, Nissan and Honda had their own incentives to go abroad positively. Nissan had been behind with Toyota in handling home market, so it tried to recover its sales share by including foreign markets. In addition, the then president had a positive attitude towards overseas production. Honda had a difficulty in increasing its market share in automobiles at home, because of a late start in automobile production. In addition, it had experience in motor cycle production abroad and young managers took an aggressive strategy for globalization. Toyota had a prudent strategy, avoiding probable risky business and attached great importance to the domestic market. But after entering into the U.S., it has been recovering from backwardness with potential advantages. Regarding to plant operation, it applies the unique production system positively as you see at the next chapter. Toyota developed a unique production system, diffused at home and even in the world. It is possible to infer that the reluctance is consistent with positive application of its unique production system. Because of uniqueness of the system based on cultural and historical background, Toyota hesitated to go abroad and applied it positively in order to retain competitive advantage after starting local production.

3. Four overseas manufacturing plants of Toyota : “Application of the Toyota Production System”

Toyota produces automobiles, trucks, and parts at 35 plants in 26 countries including through licensing agreement, joint venture, and independent operation as well as plants under construction like in UK. Of those, I had a chance to visit four plants, which locate in the U.S., Canada, and Taiwan, started operation in 1980s (Table 2).

Here I would like to make sure our research framework and result of field research. Stated at the first chapter of this paper, the Japanese Multinational Enterprise Study Group, in which I take part, has done research on Japanese-affiliated plants in North America. The central theme of the study is how the Japanese production system can be effectively transferred to American Society, where the socio-cultural environment is different from that in Japan. We focused our concern on the applicatory situation of the system with relation to local environments. We set 23 elements in order to quantify and illustrate major findings from our field observation and created a five-point grading technique for each element. Within this ranking, a five-point score indicates the highest possible degree of application of Japanese system and a one-point ranking indicates the highest possible degree of adaptation to local environments. By this ranking, we can easily estimate application-adaptation level, though not exactly. In addition, we arrange 23 elements in two different groups. One is “Six group evaluation” in which we classify 23 elements into related 6 groups. Another one is “Four Aspects Evaluation” in which we classify 19 elements out of 23 into 4 groups⁶⁾.

One purpose of this paper is to show positive application of the system, so I use both average point of 23 elements and “Four Aspects Evaluation” here. “Four Aspects Evaluation” includes “Methods”, “Direct”, “Human Elements”, and “Material Elements”: “Methods” indicates transfer of Japanese system or method, such as job Classifications, Wage System, Quality Control, into the plants. “Direct” represents transfer that are ready-made, such as Production Equipment, Ratio of Japanese Expartriates, into the plants. We classify those four aspects into “Human Methods”, “Material Methods”, “Human Direct”, and “Material Direct”, so that we can estimate applicatory situation of the four different aspects (Table 3 and 4).

According to our conclusion, the Japanese plants in North America applied the Japanese production system not entirely but selectively, depending on a company strategy. At the industrial level, we could see the following specific features. Allow me to cite only concluding types: The automobile assembly indicates “high and methods application type”, the automobile parts indicates “high and direct application type”, the home electronics indicates “adaptation type”, and the I.C. indicates “direct application and methods adaptation type”. According to this disposition, the automobile assembly displayed a tendency for an application-orientation and applied methods positively, which doesn't seem easily adaptable to different environments (see the Table 3).

Now let me compare the average points which were calculated for 9 Japanese-affiliated automobile plants in North America with the points of three plants of Toyota. First, I would like to indicate that the rates of application in methods of all

Table 2. Profile of the Four Automobile Plants in North America and Taiwan

Plant	Location	Start of Operation	Ownership (Japanese ratio)	No. of Employees	No. of Japanese Expt. (%)	Capacity (Annual)	Volume of Production	Product Models	Structure of Plant
NUMMI	USA, CA	1984	Joint-Venture (50%)	2,800	34 (1.2%)	200,000	204,285	Pass. Car 2	Stamping, Welding, Painting, Assembly
TMM	USA, KY	1988	Wholly-owned	2,950	72 (2.4%)	200,000	211,131	Pass. Car 1	Stamping, Welding, Paint., Assembly, Engine, Plastics
TMMC	Canada	1988	Wholly-owned	1,000	31 (3.1%)	50,000	60,793	Pass. Car 1	Stamping, Welding, Painting, Assembly
Kouzui	Taiwan	1988	Joint-Venture (49%)	1,441	34 (2.4%)	40,000	18,167	Pass. Car 1, Truck 4	Stamping, Welding, Painting, Assembly

Source : Interviews in 1989 and 1990. Japan Automobile Manufacturers Association, Inc., *The Motor Industry of Japan*, 1991.

Notes : 1) "Pass. Car" means Passenger Car. "No. of Japanese Expt." means Number of Japanese Expatriates.

2) Volume of Production indicates production in 1990, while Taiwanese plant in 1989.

3) NUMMI adds truck line with 100,000 capacity in 1991. TMM will add another 200,000 capacity for passenger car production in 1994. TMMC will expand its capacity to 100,000 in 1992.

4) Kouzui had started truck production through licensing in 1984.

Table 3. Four Aspects Evaluation of Hybrid Model for Japanese-Affiliated Plants in North America.

	Average (4 Ind.)	Home Elect.	I. C.	Auto. Parts	Auto. Assem.	NUMMI	TMM	TMMC
Human Methods	3.1	2.4	2.9	3.4	3.6	3.7	3.8	3.7
Material Methods	2.8	2.4	2.4	3.1	3.3	3.3	3.3	3.3
Human Direct	3.6	2.9	3.9	4.3	3.6	2.5	3.5	4.5
Material Direct	3.6	3.2	4.2	3.8	3.3	3.0	3.7	3.7
Methods	3.0	2.4	2.8	3.4	3.5	3.6	3.7	3.6
Direct	3.6	3.1	4.1	4.0	3.4	2.8	3.6	4.0
Average (23 Elem.)	3.3	2.7	3.2	3.6	3.5	3.4	3.7	3.8

Source : Calculation by Japanese Multinational Enterprise Study Group.

Notes: 1) 'Average' was calculated for 34 Japanese-affiliated plants of 4 industries, such as Home Electronics (9 Plants), Integrated Circuit (7 Plants), Automobile Parts (9 Plants), and Automobile Assembly (9 Plants) in North America.

2) 23 Elements include ① Job Classification, ② Wage System, ③ Job Rotation, ④ Education & Training, ⑤ Promotion, ⑥ Role of Supervisor, ⑦ Production Equipment, ⑧ Quality Control, ⑨ Maintenance, ⑩ Plant Operation, ⑪ Local Content, ⑫ Suppliers, ⑬ Procurement System, ⑭ Small Group Activities, ⑮ Information Sharing, ⑯ Unity, ⑰ Employment Policy, ⑱ Employment Security, ⑲ Union, ⑳ Grievance System, ㉑ Ratio of Japanese Expatriates, ㉒ Delegation of Power, ㉓ Managerial Status of Local Managers.

3) Human Methods include ①, ②, ③, ④, ⑤, ⑥, ⑭, ⑮, ⑯, and ㉑.

4) Material Methods include ⑧, ⑨, and ⑬.

5) Human Direct includes ㉑ Ratio of Japanese Expatriates and ㉓ Managerial Status of Local Managers.

6) Material Direct includes ⑦ Production Equipment, ⑪ Local Content, and ⑫ Suppliers.

7) Methods include Human Methods and Material Methods.

8) Direct includes Human Direct and Material Direct.

Table 4. Four Aspects Evaluation of Hybrid Model for Japanese-affiliated Auto Plants in Taiwan.

	Average	Kouzui
Human Methods	3.7	4.0
Material Methods	3.0	3.3
Human Direct	2.0	3.0
Material Direct	3.1	3.7
Methods	3.5	3.9
Direct	2.7	3.4
Average (23 Elements)	3.3	3.7

Source : Calculation by writer and Prof. Itagaki (Saitama Uni.).

Notes: 1) 'Average' was calculated for 5 Japanese-affiliated plants in Taiwan.

2) Other remarks are same as in the Table 3.

the three plants exceed the average point of 9 plants. Namely, even though the average "Methods" rating is 3.5, that of the three plants exceeds the point; NUMMI (New United Motor Manufacturing, Inc.) is 3.6, TMM (Toyota Motor Manufacturing, U.S.A., Inc.) is 3.7, and TMMC (Toyota Motor Manufacturing Canada Inc.) is 3.6. In addition, the points of three plants in "Human Methods" exceed the 3.6 average by 0.1 or 0.2 of a point. However, each plant shows same 3.3 as the average in "Material Methods". In other words, a higher degree of application in "Human Methods" contributes to a higher than average degree of application in all "Methods". Second, plants of Toyota show a high rate of application in the "Direct (ready-made)" category, even though it is disperse. Whereas the average in "Direct" is 3.4, two plants exceed it; TMM is 3.6 and TMMC is 4.0. TMM and TMMC which are newly constructed in green fields exceed the average point. Third, accordingly, the rating for two plants which are wholly-owned exceeds the average in both "Methods" and "Direct". As a result, regarding to the average point of 23 elements, while the average of 9 plants is 3.5, the wholly-owned two plants, TMM and TMMC, which are 3.7 and 3.8, surpass it. NUMMI, a joint venture, is less than the average by 0.1 point.

How about in Taiwan? It is very interesting that the Taiwanese plant of Toyota has almost same type of application as TMM. The average 23 elements for five Japanese-affiliated plants is 3.3, which is less than the average in North America. This is because all Taiwanese plants are joint ventures, localization of management goes forward more than in North America, and difficulty in adoption of Japanese type procurement system due to a lack of reliable parts markers. Nevertheless, the average in "Methods" is 3.5, which is the same as in North America. The application related to human methods is receptive smoothly in Taiwan, contrary to our general expectation stemming from a short history of automobile manufacturing. Kouzui (Kouzui Motors, Ltd.) is at the 3.9 point in "Methods", which exceeds the average by 0.4 of a point. "Human Methods" gets an unusually high 4.0, which surpasses not only the Taiwanese average but also that of North America. In addition, the "Direct" category rated high at 3.4, which goes far beyond the average of 2.7. As a result, the average (23 elements) of Kouzui is 3.7 and exceeds the the average of five plants by 0.4 point.

In summing up the application situations for four plants in North America and Taiwan, firstly, four plants show high rate of of application both in the average and in "Methods", especially in "Human Methods". This means that Toyota applies its unique production system positively in order to retain the competitive advantage in foreign countries. Secondly, three plants except for NUMMI also show high rates of application in the "Direct" category. High rates of application in Japanese methods accompanies high rates of application in "Direct", which means transfer of ready-made features into local plants from Japan. In other words, "Direct" supports the application of "Methods". Thirdly, both TMM and Kouzui have a same tendency of application. This possibly suggests that when Toyota put a great deal of effort in application of the unique production system at local plants, this application type appears. I would like to explain the application situations for four plants more concretely by focusing on such elements as work organization, production control, labor relations, and Japanese expatriates.

As for NUMMI, at first, I should state the process of entry. Toyota, which was extremely cautious in anything and was especially negative about starting local production in the developed countries, agreed to a joint venture with one of the Big

Three on starting production there. They were unable to reach an agreement for a joint venture with the first company, Ford, which they had selected to negotiate with and then concluded a deal for a joint venture with GM (Shishido and Kusama, 1988). The American partner leaves the operation of the plant to Toyota, because they hope to learn about Japanese-style management and rely upon the small car model produced there⁷⁾. On the one hand, Toyota did not need to construct a plant and could reduce the cost of providing machinery into the plant, because they employed useful machinery that already existed directly into operation. But on the other hand, they had to employ former workers who had been laid off as well as accept the labor union. Then Toyota hired a former Secretary of Labor as an advisor who acted as an intermediary in talks between the company and the UAW. Both parties based their strategy on the concept of mutual trust. They then agreed that a priority for hiring former workers, job security, simplification of job classifications, adopting team system, and an implementation of job rotation, etc⁸⁾.

Upon reopening the plant, they used mostly old facilities, including painting machines, except for the construction of a new stamping shop and the addition of some robots in the welding shop. The assembly line was shortened by one third, because it was too long for the Japanese system. They did not provide new machinery into the plant, because they did not have a strong motivation to do so due to the form of the joint venture. But they adopted the unique production control system positively. They introduced the Just-In-Time system which minimizes stocks and 'Jidoka', which means a policy of setting only such machines as would notice malfunction to stop automatically and of letting workers stop the assembly line when they noticed defects. They adopted such a flexible system that workers would perform multiple jobs and even shift positions in order to implement the production system. They changed the traditional work organization by which a worker performs only one assigned job repeatedly, an inspector checks quality of goods specially, and an industrial engineer sets production standards. Simplification of job classifications is a necessary condition for reforming the traditional work organization. Job Classifications, on which both parties has relied in the U.S., decide hourly wage rates and make a route of promotion within classifications together with seniority. It was fortunate for NUMMI to have a model to change it. General Motors has already implemented both simplification of job classifications and team system at some plants copied from Scandinavian experiments.

New job classifications form only one production category and two maintenance categories, which were traditionally named "skilled trades". Based on this reformation, they introduced a team system modeled after the Japanese group work system. Leaders are delegated the right to control ordinary work and manage workers. Thus they adopted unique work organization which entrusts rights relating to manufacturing automobiles to workers and leaders in shop floor. Accordingly, workers in the shop floor not only perform his direct work but also have some responsibility in quality and maintenance of machines. Of course, there are special divisions of quality control and maintenance. The new system makes it possible to broaden one's responsibilities by crossing traditional job boundaries. Workers are required to do job rotation within a team in order to be multi-skilled workers and to avoid monotony. Leaders check workers' progress in skill. Together with this reformation of the traditional job classifications system, they put a limit on operation of seniority. Seniority is effective

in determination of vacation. But promotion, shift preference, and transfer are determined primarily by ability, and if this is equal among applicants, then seniority becomes effective.

I would like to explain promotion to team leader here. A team leader is a member of so-called hourly workers, thus being able to be a union member. So it is difficult to adopt such a Japanese way of promotion that direct supervisor recommends a candidate, after that, managers approve him. When a vacancy occurs, they announce it to team members assigned to the group (of both day and night shifts) which is formed by teams. It seems normal to announce it to team members within the group, because the workers have the necessary skills. If there is no applicant, then it extends to section members. A joint selection committee composed of equal numbers of company and union representatives takes responsibility for interviews, test and selection. They have a written standard to evaluate worker's ability ; such as performance of tasks, administrative ability including work assignment, communication, experience and knowledge, attendance record and participatory attitude as manifested in suggestion making etc. The committee makes an assessment for applicants based on the standard. Selection is decided based on the assessment and if applicants have the same ability, then seniority becomes effective. They make an agreement with the union which solves problems within company whenever possible. They set up a labor-management conference system which assures communication between both parties aside from collective bargaining.

Regarding grievance procedure, there is a policy to resolve problems at the shop floor level through talks between workers and leaders without going through the formal grievance route. Rare cases go to the final fourth step of outside arbitration. In addition, they restrict arbitration items : Wage, production standards, health and safety are not arbitrable. In the case of the Big Three, unions have kept the right to resort to strikes even during the terms of contract regarding to such items as production standards, and health and safety, because managers had decided to change work load by changing line speed unilaterally after establishment of Fordism. Apart from such general agreements between the Big Three and the UAW, the local union sanctioned abandonment of the right to strike in those items. However, the two parties may ask for a resolution by both NUMMI's advisor who was former Secretary of Labor and representative of the UAW region, if they could not solve problems regarding production standards. This framework of labor relations, by which management requires a consensus with the union through continuous talks on issues including production standards, becomes a model for other Japanese-affiliated unionized automobile plants. Also, the agreement supports clearly job security, so this management's position, which does not suppose lay-offs although it reserves the right to use it after every other possible effort has been made, may be responsible for their success in getting agreeable response by the union to a flexible work organization (Brown and Reich, 1988).

Last, I should mention Japanese expatriates here. Even though there are clear parallels regarding work organization, production control, procurement of parts, group consciousness, and labor relations among Japanese-affiliated plants in North America, the number and role of Japanese expatriates are different for each company. There are three different types among them : (1) Honda sends a lot of Japanese reaching 4 or 5% of all employees ; and they are posted at formal higher managements

levels as well as in advisory positions. (2) Nissan sends an extremely small number of Japanese, who constitute less than 1% of all employees, and they are stationed as advisers to local managers. In contrast, (3) Toyota sends a relatively moderate number of Japanese, constituting about 1 or 2% of all employees, and they are posted at both formal management positions and advisory positions. Almost all Japanese-affiliated plants belong to this type. Looking at NUMMI, there are 34 Japanese expatriates, comprising 1.2% of all employees. Positions they fill range from president and some vice presidents and senior managers and advisors too.

Thus, the management system of NUMMI offers a model for following two plants of Toyota, of course, there are some differences in the form of entry, capacity, unionization, etc.

It is not clear whether or not Toyota had a policy to build a new plant independently, after they got an agreement of joint venture with GM. I might suppose that less risky choice of joint venture included a possibility of independent operation through gaining experience in plant management in the U.S. As a matter of fact, Toyota decided to build plants both in the U.S. and Canada, because they could not only extend their sales share in the U.S. market due to a renewal of the voluntary exports restriction, but also served to furnish local production for the dealers having apprehensions of a decrease in their market share owing to a shortage of products. On that occasion, the chance to gain experience in plant operation helped the company to reach the decision, because they would be assured capability to apply their unique production system there. In February 1985, Toyota organized a team in its Overseas Project Office to study the possibilities for independent production in North America. In July 1985, they formally announced the company's decision to build plants in the U. S. and Canada⁹⁾. TMM, one of them, applies its unique production control system positively. What is more, they apply it with revisions that consider local managerial environments rather than direct transfer.

Regarding plant structure, shops are comprised of such integrated process as stamping, welding, painting, and assembly as well as power train shop producing engines and a plastics shop. Main facilities come from Japan, modeled after the mother plant producing the same automobile, after some trial operation. Thus we can be assured of the company's prudent policy to bring new but confirmed facilities into the plant and produce existing model¹⁰⁾.

There are 72 Japanese expatriates comprising 2.4% of the total employees. The number and percentage are in intermediate range for such plants, between Nissan and Honda. Concerning administrative organization, Japanese expatriates hold positions as president, one vice president and some senior managers, but other responsible positions are given to local managers. Even in the latter case, Japanese expatriates take positions as partners for them, and teach them Japanese-style management.

TMM follows NUMMI's management system basically regarding work organization and group consciousness, but there are some revisions in terms of application. First, the prudent policy appeared in hiring. They hired employees through careful selection procedures composed of five steps, and most hourly workers came from the local area, Kentucky. They put a great importance to potential and understanding rather than experience or skill as selective factors. As a result, not a small number of hourly workers had college degrees. It seems that they expected hourly workers to be multi-skilled and take part in Kaizen activities (continuous improvement). In addition,

they promoted hiring minorities and women positively, and placed them not only in production job but also maintenance job.

Second, they have an interesting training and education project. They hired rather larger numbers of maintenance workers than had the other plants in order to implement their unique production system, and give them a systematic training plan. The training scheme was written in Japan at first, where workers master intuition and the art of efficient labor through On-the-Job-Training. This was later revised in the U.S. It subdivides tasks of maintenance into 27 thousand elements and regroups it into 7 steps systematically so that workers can master it through training at the training center within the plant during three years.

Third, they introduce an extremely unique wage system. That is to say, one part of the wage is slightly determined by performance evaluation. This is the sole case among the Japanese-affiliated plants in North America. UAW had criticized "favoritism" by managers which had caused discrimination among workers. So UAW had denied piece rating which made possible favoritism and asserted simple hourly rate. Other Japanese-affiliated automobile plants avoid adopting performance evaluation which causes wage deference among workers whether or not they have an union, considering the adversary history of wages. Contrary to this, TMM adopts performance evaluation slightly. Namely, performance evaluation has impact not upon the base wage but upon part of an award. The base wage is determined by the job and a part of an award paid twice a year is determined by performance evaluation. They pay the award for 15% of annual earnings. 14 % of that is determined by productivity, quality, safety and attendance at a company level and only 1 % is determined by performance evaluation. The evaluation both by group leader and team members contributes equally to it. Thus the evaluation by team members and group leaders having a right of worker management distributes the effect equally. The reason for introducing it explained by a manager was that wages should reflect differences in skill, work load, and attendance. Even though managers asked workers to rotate jobs in order to equalize work and to be multi-skilled, those differences remain. If performance evaluation decides base wage, unrecoverable wage difference will occur. So this function become part of the bonus.

Fourth, regarding workers' movement within the plant, they choose basically same system as in NUMMI. Job rotation is ordered by group leaders who have a right to assign work, and workers rotate jobs within team regularly every 2 or 1 hour, directed by team leaders in practice. At the time when we visited, each worker was asked to master the tasks of at least two persons, and group leaders kept a record of skill progress, composed of five steps. They could not form the same Kaizen teams composed of production workers and maintenance as in Japan, because of demarcation between them based on wage difference. So they organized a task force type team for the Kaizen team formed from maintenance workers. Concerning promotion from workers to leaders, they did not adopt the Japanese way of recommendation of candidates by their direct supervisors. That is to say, after posting the vacancy, workers take applications, and after that applicants are given training. The manager decides on promotion according to the results of training and an interview. In this case, if total points were equal, seniority is effective.

At last, they put a great importance to production management by providing larger staff than in Japan for enrichment of logistics. Due to a lack of continuous delivery

of good quality parts, the mother plant in Japan prepares for sending parts unremittingly. Though they apply their unique production system within plant operation, they can not easily ask parts makers for a Just-In-Time delivery. So they start to introduce multi-delivery from Japanese-affiliated parts makers.

Toyota announced the construction of a Canadian plant at the same time with the American plant, aiming to supply automobiles for the North American market from three plants¹¹⁾. TMMC started operation in 1988 with a rather smaller capacity of 50 thousand cars a year, considering the narrow market in Canada.

The structure of the plant is composed of stamping, welding, painting, and an assembly shop. Here they did not have an adventure in producing a new automobile model or installing new facilities. They produce their domestic compact best seller, the Corolla. Regarding facilities, they installed a tandem type of press machines at the stamping shop. Though twenty-one robots are installed at the welding shop, the rate of automatization remains at 38 %. They decided to keep it at a lower level, because of the smaller scale of capacity and difficulty in hiring skilled workers. Whereas the flexible body line, which is the state-of-the-art welding machine in the most important process of welding, is installed, they have strong confidence in its operation. This machine has been used at the mother plant in Japan. The assembly shop installed relatively few robots and is composed of a hundred work stations which are smaller than the other plants, due to smaller capacity. I noticed half-manufactured automobiles displayed within the plant so that new employees can learn the inner mechanism of the automobile. Also there are some places where workers can practice fastening bolts.

Work organization and group consciousness are basically the same in NUMMI. There are only two job classifications, namely a production team member and a maintenance team member, being much more simplified than the case of NUMMI and TMM. They do not adopt performance evaluation for hourly workers. A team is composed of about five members and a team leader manages it. A group leader controls some teams. Group leaders have authority to assign work and team leaders carry assignments out in practice¹²⁾.

They realize 50 % of local content, which is required by the government. They buy most parts from Canadian parts makers because Japanese-affiliated makers have built few plants in Canada. Though they can apply the unique production system within plant, they can not ask outside parts makers to make Just-In-Time deliveries. As a result, they must stockpile many more parts than in Japan. Implementation of the JIT seems more difficult in Canada than in the U.S.

There are 31 Japanese expatriates, reaching about 3 % of all employees. A Japanese hold the position of president and both Japanese and local managers hold other positions. When a local manager is placed at a responsible position, Japanese acts as a partner and advisor in the same manner as in NUMMI and TMM. The labor force is a non-union, like TMM.

It was not easy for Toyota to enter into Taiwan. A local company which got a licensing from Nissan had monopolized the automobile market in Taiwan for a while after World War II. One company to which Toyota jointed entered the market in 1968. The company sold parts of equity to Ford, so Toyota retreated from Taiwan. After that, the Taiwanese government embarked on a project to produce 200 thousand cars, modeled after a Korean policy for its automobile industry. Toyota was selected

as a partner of the project. But the project was canceled, because there was a considerable discrepancy between the government and Toyota concerning the degree of local content, rate of product exports, and technology transfer. After that, the government announced a new automobile industry policy which included a decrease in necessary rate of product exports in 1985. Then Toyota created a joint venture with which a related firm of Toyota already had ties¹³⁾.

There are ten car makers and excessive competition among them in Taiwan. The sales volume of cars is about 500 thousand units, including passenger cars and trucks, and of that imports have a 40 % share. There exist no plants which fulfill a production volume of economies of scale. Kouzui is the ninth entry, having a 40 thousand unit annual capacity. It is a typical multi-products and small production volume plant¹⁴⁾.

Unlike the case in the U.S., there is no established system like Taylorism and Fordism in Taiwan. Also, parts makers have not built up, due to short term of automobile manufacturing history. Therefore, there are two different aspects to application of the Japanese production system ; an easy aspect and a difficult aspect. In the U.S., Japanese managers had to change the systems formed under Taylorism and Fordism in order to apply Japanese-style work organization, labor relations, etc. But they do not need to change such a established system in Taiwan. Taiwanese management environments are very agreeable with the Japanese system. This may come from late industrialization of Taiwanese economy and common character in culture between Japan and Taiwan. Thus application of the Japanese-style work organization and labor relations is relatively easy. On the other hand, there are some adverse conditions : a high rate of turnover, a lack of skilled workers, and insufficient quality of parts. Due to such a different environment from the U.S., the way of application is also different in Taiwan.

I would like to explain work organization, production control, procurements, and Japanese expatriates here. Because, as is the case with Japan, a system of strict job classifications does not exist in Taiwan, there is no need to change it. There are three different wage systems in the Taiwanese automobile industry : (1) a ranks and grades system similar to that of government officials, (2) a Japanese-style qualification system combined with seniority and performance evaluation, (3) an American-style job-based wage system. Kouzui adopts a typical Japanese-style wage system, different from that of the U.S. Promotion is determined by recommendation of a candidate by direct supervisor and performance evaluation. In addition, a team system was introduced naturally and leaders are given rights of production control as well as worker management.

There are no difficulties in introducing the Japanese-style work organization institutionally in Taiwan. Problems occur in working of the system. At first, Kouzui has not still implemented job rotation because of high rate of turnover. Theirs is more like a Japanese wage system in which seniority is functional as a determinant. Upon this system, the wage level at hiring remains relatively low, so it does not suit needs well, given the high rate of worker turnover. Though they had introduced the Japanese wage system to create a productive work organization, Japanese managers are thinking whether their decision was right or not. The problem is how to decrease the turnover. In the U.S., Japanese-affiliated automobile plants successfully keep workers staying with their plants, partly because they selected locations in rural areas where workers do not move frequently and partly because they pay a much higher wage than

local levels as step to deal with unionization. The situation is not the same in Taiwan. In addition, there has not been a custom among workers to teach each other, so they must bring such a new corporate culture into the plant through training and education. They have same system in group consciousness, labor relations as in Japan.

Regarding production control, main facilities come from Japan and incidental facilities are provided in Taiwan. Painting and assembly shops are renovated, whereas stamping and welding shops are newly constructed and located close to the assembly shop. They install tandem type press machines being used in Japan. Few robots are set at the welding shop. On the other hand, they introduce the unique production system positively. Managers say that they have a self-confidence in most positive application of the production system among the company's knocked-down type plants overseas. The cycle time is six minutes, longer than at Japanese plants, because both passenger cars and trucks are manufactured on the same assembly line. They bring the standardized work, quality control into the plant from Japan. Leaders have nearly mastered how to make standardized work sheets. Most workers master their tasks very quickly, taking only three months. When I visited the plant, I had a chance to see a sheet indicating the time of die change. It showed almost the same time as in Japan. Workers conduct this change very smoothly once every hour. Even though workers have mastered their tasks very quickly, they still seem to lack a strict sense of making good quality products. Many more adjustments are needed here than in Japan and larger numbers of inspectors are placed in the plant.

There are also problems in quality of local parts, and careful attention must be paid to this. Toyota required Japanese parts makers to accompany them. They have a special room to display parts, naming makers products within plant. Also they have a policy to encourage local parts makers through long term trades, including guidance for quality comparable to Japan. While using Kanbans within plants, they can not apply this approach to outside suppliers.

At last, I should mention Japanese expatriates. The situation is almost same as in the case of North American plants. As already stated, all Japanese-affiliated plants are joint ventures with Taiwanese capitalists. Of five plants visited, three local partners have leadership in management, and Japanese partners have managing right at the other two plants which have entered recently. In the case of Kouzui, Toyota has leadership in management. Japanese expatriates number 34 persons, including those Japanese sent by other Japanese companies joining it. The rate of expatriates has reached 2.4 % of all employees, which is same as in TMM. The chairman of the board is Taiwanese and the president is Japanese. Main posts are shared by both partners.

4. Concluding remarks

Features of Toyota's multinationalization should be characterized as reluctance, prudence in decision making to go abroad, and positive application of Japanese production system. I would like to mention some concluding remarks here. First, it lagged behind Nissan and Honda in making inroads into developed countries. This delay resulted from its policy to choose exportation of finished products as an advance into developed countries instead of risky local production. What stimulated

its strategy from exports to local production was a limitation of exports volume to the U.S. due to voluntary exports restriction and an extension of market share through local production by Nissan and Honda, especially Honda. Upon occasion of local production, the company was very prudent. In the U.S., at first, it selected a joint venture with one of the Big Three. They used a closed plant of the American partner, supplying products for both companies. After making organizational restructuring for overseas activities through a merger of TMC, the production company, and TMSC, the sales company, they launched into local production in North America. Then it decided to build two plants in the U.S. and Canada. It also lagged behind Nissan in local production in Europe. A plant in UK is under construction now. Three plants in North America are extending capacity or have announced a plan to construct another plant. Though Toyota is recovering from backwardness in local production, it is still reluctant to have a regional headquarters. Nissan and Honda built regional headquarters in the U.S. and Europe and began to delegate powers from Japan to them. Toyota controls overseas activities through the Overseas Operation Department at home, still showing reluctance in this aspect.

Second, it applied Japanese production system positively in North America and Taiwan. According to our evaluation points, four plants recorded high scores of application, especially in "Methods" commonly. At the same time, TMM, TMMC, and Kouzui showed high rates of application of the "Direct (ready-made)" category. This implies that a high rate of application of "Methods" accompanies a high rate of application of "Material Elements" and "Human Elements", which means bringing "ready-made" from Japan into local plants. Or "Direct" supports a high rate of application of "Methods". It is possible to infer that a high rate of application of the Japanese system and a high rate of application of both "Methods" and "Direct" stemmed from a management policy of Toyota. Because Toyota put a great importance in building those three plants, after having prepared for positive overseas activities through merger of the production and sales companies. The percentage of Japanese expatriates ranges from 1.2 % to 3.1 % of all employees, being an intermediate place between Nissan and Honda. Nissan sent the smallest number of Japanese overseas, at less than 1 %. Contrary to this, Honda sent lots of Japanese, reaching 4 or 5 % of its total employees.

Third, Toyota showed not only positive application but also a revised way of application considering local managerial environments. Although Japanese companies apply the Japanese-style management to retain competitive advantages, if they do it by a revised way adapting to local environments, it is possible to realize the application through a local form. In addition, if local managers realize it without Japanese, this becomes a ideal type of application as multinational enterprises that make good use of foreign resources. Revised way of application deserves to much attention having direction for that. How and to what extent local managers will carry it out is the problem.

Notes

- 1) The Japanese Multinational Enterprise Study Group, to which I belong, conducted field research on Japanese affiliated-plants in the U. S. in 1989. The result of

the research was published (Abo *et al.*, 1991). Also I had a chance to do research on the Japanese-affiliated automobile and electronics firms in Taiwan with Mr. Itagaki, Prof. at Saitama University in 1990. We evaluated the hybrid ratio for the plants which were shown in the Table 4. We used the same criteria of the hybrid ratio as for the U.S. plants shown in the above publication.

- 2) I should explain the Toyota production system that the company applies at local plants here. Fordism realized mass-production by introducing belt conveyer system and specialised tools as well as deploying semi-skilled workers. Also the system completely divides functional work into engineering of process technology, quality control, and direct work at shop floor. In addition, each production process pursues economies of scale. Accordingly, lots of parts inventories are necessary in each process. In contrast to this scheme, the main concept of Toyota production system is to eliminate every form of waste. It has two main pillars, the Just-In-Time system and 'Jidoka'. However, having followed the belt conveyer system of Fordism, it developed a unique system. The Just-In-Time refers to efficiency, which provides parts by order of following process, including parts suppliers. 'Jidoka' refers to quality of products, signifying the self-regulation of the entire process. Machines stop automatically when a manufactured product with a defect is detected and workers have a right to stop line when detecting a defect. This system requires flexible work organization. Workers are required not only to do their job but also to be multi-skilled, taking on other jobs as needed and being responsible for some maintenance and quality control (Ohno, 1978; Womack et al., 1990).
- 3) There are two different kinds of knockdown assembly. Semi-knockdown assembly (SKD) means that component parts are knocked down at home country into such a level that they can be assembled easily by using bolts and nuts in the host country. Complete knockdown assembly (CKD) means that each unit of parts are knocked down at home country and are assembled at host country through welding, painting, and assembly process. Most KD assembly is a type of CKD.
- 4) In this paper, I classify the form of entry as follow. 'Licensing' which means licensing agreement, 'Joint Venture' which includes an equity joint venture and excludes a contractual joint venture, and 'Wholly-Owned' which means Japanese company holds all equity.
- 5) Toyota Motor Corporation, 1988, p. 315.
- 6) See Evaluation Model in our book (Abo *et al.*, 1991).
- 7) Toyota Motor Corporation, 1988, p. 330.
- 8) Interviews at NUMMI on March 14, and August 17, 1989.
- 9) *Ibid.*, p. 338.
- 10) Interviews at TMM on October 10, 1988 and September 21, 1989.
- 11) *Ibid.*, p. 343.
- 12) Interview at TMMC on August 30, 1989.
- 13) *Ibid.*, p. 368.
- 14) Interview at Kouzui on September 4, 1990.

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