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**RESTRUCTURING AND GLOBAL STRATEGY
OF THE JAPANESE AUTOMOBILE INDUSTRY
AND ITS PERSPECTIVE**

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MITJP 96-15

Center for International Studies
Massachusetts Institute of Technology

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The MIT Japan Program Working Paper Series provides an important means to achieving these ends.

I. Introduction:

With a stubborn recession after the burst of the bubble-economy and a radical yen appreciation (endaka) since 1993, the Japanese automobile industry is at turning point for strategic business planning. In the 1980s, the industry had a significant impact on the world auto industry as the concept of lean production spread across the globe. The core element of the industry's most recent strategy is restructuring domestic business contents and systems, strengthening overseas production with particular care to ASEAN countries, and establishing a global strategy through the formation of worldwide networks for overseas production and business bases.

The Japanese domestic business plan and global business plan work hand-in-hand. There are, however, different origins between both strategies. Basically, domestic restructuring stemmed from the domestic recession after the burst in the bubble economy, and global restructuring evolved from increasing trade friction, spurred by a radical increase of car exports. Recently we have seen that as the yen continues to climb, exports from Japan are becoming more and more expensive and thus are on the decline. Restructuring the domestic policy, therefore, will inherently strengthen global competitiveness.

Each Japanese automaker has different factors influencing its global strategy, depending on its present position in the market. Toyota, Mitsubishi and Suzuki, for example, do not need to alter their domestic and global strategy, for both are strong because of their effective domestic restructuring. Nissan and Mazda, however, are still pursuing a radical restructuring process -- simultaneously reconstructing their domestic strategy and strengthening their global strategy in Asia and in the West.

Honda has benefited from its global strategy, especially in the North American market compared with other Japanese companies, and the automaker now wishes to strengthen its Asian strategy and domestic strategy -- for the company is in a relatively inferior position locally. Isuzu and Mazda have U.S. automakers as strategic partners. These companies will continue with their global strategy of a partnership for production and development technology, hoping that this strategy will lead to a stronger and more noticeable presence in their domestic market. Fuji

and Daihatsu, who still belong to the Nissan group and the Toyota group respectively, are pursuing an independent strategy. They hope to capture a share of the Asian and domestic market by offering special car categories, such as four-wheel drives and mini cars.

In this research paper I will detail the restructuring strategies that Japanese auto companies have developed, and I will explain how they will be able to use their restructuring fruits toward their future strategy. The yen's rapid and radical appreciation, unfortunately, has offset potentially positive results of restructuring. As a result, the Japanese global strategy has tended to orient local production in developed countries. But Japanese companies are now accelerate with a global strategy to include the ASEAN area. I will therefore describe this new strategic trend of focusing on the ASEAN market. In this description process, I will form an hypothesis that the Japanese automakers' restructuring and global strategy will combine more closely.

II. Specific Features and Results of the Restructuring Strategy by Japanese Auto Makers:

As I have noted, the Japanese automobile manufacturers have had a difficult time decreasing long-term production output and proceeding with their restructuring due to four years of continuous recession, since 1991. The peak production output for all Japanese auto companies was 13.48 million automobiles in 1990. Since then, the output has decreased continuously: 11.27 million in 1993 and 10.55 million in 1994. This is a 2.93 million decrease from that peak year. The main reason for this output reduction has been the Japanese recession and an increase in overseas production. Through these four years of continuous reduction, Japanese automakers began a radical restructuring in order to reduce their break-even point which had ascended during bubble economy period.

The contents of restructuring differed among companies. Some automakers such as Mitsubishi, Suzuki, Isuzu and Fuji didn't largely cut off their production capacities; they didn't expand investment capacities, but they tried to focus on the strength of their product concept or engineering capability. Toyota, who has powerful sales capability in the domestic market, tried to decrease the operational ratio of some plants or the

production line in others, and it attempted to coordinate car products and production capacity in each plant because of a newly opened Kyushu plant. Yet the company didn't cut down its big-scale production capacity. Toyota even decreased its automation investment and changed the contents of automation production system. In contrast to these companies mentioned, Nissan and Mazda tried to increase product line and production capacity during the bubble economy period, largely due to an inferiority of sales capability. The eminent tendency, however, was to integrate car lines, shut down some plants and decrease the operational ratio of some production line. Generally in this restructuring process there has not yet been the large scale layoffs and plant closings, as was the case with the American Big Three. But there will be a cut in the number of recruits and white collar workers, as well as a reform in the lifetime payment system. We cannot deny the possibility of a small-scale layoff due to the rapid development of globalization.

In this situation, the most eminent tendency is to decrease the number of car categories, which increased radically in the last decade, and also to decrease the number of car variations. Furthermore, automakers are going to decrease the number of parts and to standardize, or commonize, them, which will greatly reduce costs. Concerning platform design and usage, they are now planning to commonize it in some car categories and to use commonly continuous models. Of course, this will eliminate the product differentiation possibilities of car design. Automakers are also pursuing the possibility of reducing expanded model change cost for each model, hoping that through a case by case method, the model change cycle may be able to be extended. In responding to the growing cost burden of increased vehicle and luxury model production, R&D for car development organization became trimmer and more simplified, and a method of shortening lead-time for new car development just started with differed model change cycle. For example, Toyota introduced its new development center system. (See figures 1, 2 and 3.) And Mitsubishi is preparing to shorten vehicle development lead-time by 18 months.

As mentioned above, the Japanese automakers' restructuring these past three years has been considerably effective in reducing costs and cutting down their break even point. The plan to reduce costs -- ¥260

billion for Toyota, ¥200 billion for Nissan, ¥60 billion for Honda and Mazda, and ¥40 billion for Mitsubishi -- has just about been met, with the exception of a few companies. (See tables 1 and 2.). This cost cutting from restructuring is due almost entirely to the commonization of parts and platforms, the decreasing parts and vehicle categories, and the reduction of parts through to develop VA VE activities. Decreased depreciation and lower wage and salary costs also contributed to the overall reduction of costs, but not so much.

Japanese automakers will continue to benefit from such restructuring -- especially from parts commonization, decreasing number of parts from an early stage of design and development, decreasing the number of development human hours, and total development system preventing after design change. These aspects of restructuring harmonize with the new CAD CAM software, connecting with the Development, Production and Parts Purchasing stages. The goal is to pursue complete constancy -- from basic design to production design -- and to eliminate cost up elements to check it perfectly from the origin of design stage. In Honda's case, with increasing overseas purchasing of parts accompanied with the yen's appreciation, the company tried to fulfill international purchasing department activity. It is now going to aim at new cost cutting possibilities despite the endaka effect by using parts purchased overseas in its early development stage through international purchasers' early participation.

As mentioned above, the Japanese automakers' restructuring produced some big results, but the ¥400 or 500 billion gained is diminished within the context of endaka. The endaka loss consists of two parts: One is the loss from the exchange rate flux of ¥130 to ¥85 per dollar in one year. The other is the decreased number of car export by losing export profitability. In the case of radical endaka, cost down merit by the restructuring has been instantly lost.

Even though there are many troubled elements, Japanese automakers are still moving forward with their restructure rationalization and are trying more to entice parts makers with their restructuring strategy. Parts makers, however, are but one group of players. Japan's restructuring strategy cannot respond to the endaka problem for every aspect of the auto industry. Overseas transfer would have to go to the developed countries and other countries in Asia, especially for mass

produced cars, with a higher export ratio and a more labour-intensive components and parts manufacturing process. In this hard situation, Japanese parts makers are confronting survival reorganization. Reorganization has just started in second- and third-tier suppliers due to the impact of the automakers' decreasing number of parts and commonization. If a supplier has design-in R&D capability and original engineering capability, it could respond to the assemblers' development policy and survive. Then we would see overseas transfer and globalization for the parts makers at a more advanced level.

III. Special Feature of Japanese Automakers' Global Strategy: ASEAN Strategy:

If the yen continues to climb, Japan will place a greater emphasis in restructuring its global strategy. In developed countries, Japanese automakers have advanced their R&D localization and local content of their parts and components, increasing production capacity in these local plants. In North America, Toyota now uses its second Kentucky second plant to produce the Abaron, and the company is expanding its Canadian plant in Ontario. Toyota's annual production volume, including NUMMI, will soon reach 800,000. Honda is also expanding its plant capacity and operational ratio, with engine or assembly plants in Alliston, Ontario, East Liberty, Ohio, and Anna, Ohio. Honda has already passed the 800,000 mark for annual production. Keen to the trend, Nissan has expanded their Tennessee plant to produce the Altima and Sentra pick-up. Together with its Mexican plant, Nissan too is approaching a total production volume of 800,000. Other Japanese auto manufacturers, as well, are increasing their plants' operational ratio without notable plant expansion.

In the EU the situation is different. Except for Nissan, local production of Japanese cars has not increased much. Nissan, however, is now producing two car lines in the Great Britain, with an annual production of over 400,000. Toyota and Honda are beginning to make a move, increasing their annual production to 200,000. These companies now are viewing production in Europe as a way to avoid the spiraling yen. It will be interesting to watch the evolution of Mitsubishi's joint venture with Volvo at the Nedcar company in the Netherlands and the

implementation of lean production technology into the Volvo production system, for the venture was established before the most recent jump in the yen.

To continue to increase local production overseas, Japanese automakers are emphasizing an increase in the plant operational ratio with existing lean production techniques rather than risky big scale investments, because they now have to consider market maturity and recession possibility. As the result, their allocation for overseas investment has shifted to Asia -- especially the ASEAN area.

The highest growth auto market next century will be the People's Republic of China, with a current population of 1.4 billion. Japanese automakers obviously have much interest in this market, but they haven't positioned themselves as quickly as their western counterparts. The Chinese government wants technological collaboration and a network of parts suppliers with the Japanese, but not really investment in Japanese assembly plants. Japan has remained prudent. There are many small scale technical license agreements and license production between Japan and China, but the investment is not significant.

Because of the endaka problem, Japanese assemblers and suppliers are increasing investment in the ASEAN area. There is a new tendency to develop Asian regional international division of labour, in which four ASEAN countries team up with NIES countries and Australia.

The increased investment by Japanese automakers in the ASEAN area is not so large compared to their transplants in the United States. Honda's new plant in Thailand will start to produce 50,000 cars annually; Toyota, Mitsubishi, and Isuzu, which have been gradually proceeded from S.K.D. to C.K.D. in Thailand for almost twenty years, plan to construct 100,000-volume car plants. Increased investment in this area originated from several reasons, although the raising yen now has certainly made investment even more attractive. One reason is the booming demand for automobiles in this area. (See chart 1.) A second reason is that industrialization has lead to an improvement in infrastructure, opening more possibilities for plant locations and physical distribution. A third reason is that, despite industrialization, the wage level is 20% toward [editors note: lower than] Japan's, and workers are relatively industrious. Now the ASEAN area is producing 1.1 million cars annually, which is third

in production volume for Asia, behind South Korea and Asia. From 550,000 cars in 1989, the production volume has doubled in only five years.

Automobile production in ASEAN countries proceeded under high import tax policy and local production promotion policy. It was necessary to be patient and to cooperate for successful local production and technology transfer. Western automakers didn't have the wherewithal for such restrictions. Japanese auto makers, however, had accumulated many years of experience from their dealings with S.K.D. to C.K.D. production from the early stages of development in this ASEAN area. Some parts suppliers also established businesses in this area in the 1960s and '70s for local production and technology transfer, and they found it difficult to sustain profits. Nowadays Japanese auto makers maintain 90% of this area's auto production, but until the early 1980s there was little profitability because of cost penalty and few scale merit. Recently, however, this area has become more profitable because of an increase in new middle class consumers -- especially in Thailand, Malaysia, Indonesia and the Philippines -- and an enhancement of the merit of international division of labor.

For the ASEAN area there has been three historical stages from cooperation for local production toward development of international division of labour system by Japanese auto makers. The first step was the establishment of the first ASEAN Complementation made by ECAFE in the late 1960s. The second step was the new ASEAN Complementation, which in 1988 approved the B.B.C., or Brand to Brand Complementation -- a mutual exchange of parts and components across national boundaries. The third step is now the stronger Japanese presence in the ASEAN area, sustained by the high yen.

The first complementation in 1960 didn't succeed because it was tended to be desk plan and didn't consider the unbalanced industrial levels of ASEAN countries. At that time GM and Ford announced an Asian Car plan to suit this complementation, but the idea never materialized. The only exceptional case was that of Toyota's *Kijan*. This model was developed for Indonesia as the independent MPV low cost model. Production started in the early 1970s. But this model was troubled by a persistent cost penalty, country disputes and resistance. This project

finally became successful after overhauling the model in 1985 and shifting the production location to Taiwan in 1988. In this first stage each ASEAN country emphasized its local production policy rather than component division of labour by the complementation. Therefore Japanese automakers and some European makers could collaborate only by S.K.D and CKD.

In the 1980s Thailand and Malaysia became more industrialized. When the first jump in the yen's value hit after the G-5 meeting of 1985, Japanese automakers increased production capacity and parts production in Thailand. In Malaysia the production of the *Proton Saga*, the people's car, proceeded more efficiently. The same could be said in Indonesia for Toyota's *Kijan* and Isuzu's small commercial vehicles. Production localization and technology transfer, which had had their problems, also improved. But the real cost advantage of localization within each individual country was relative to the respective economy (by scale). The cost penalty still remained. In 1988 the new ASEAN Complementation acknowledged this problem, and the ASEAN auto industry entered a stage.

The most specific feature of the new Complementation is that it approved mutual complement of the same car brand components by division of labour in ASEAN area and decreased import tax of parts and components under BBC approval. This new agreement made easier brand to brand complementation for Japanese companies. Before this new agreement, Toyota and Mitsubishi had already started a complementation division of labour. They simply accelerated this strategy, and other automakers followed. The Philippines, with a newly albeit relatively stabilized political situation, and Indonesia, who had been reluctant about agreeing to local engine production, signed the new agreement in 1993. This new situation promoted brand to brand regional division of labour for four main ASEAN countries. The Philippines started to actively encourage the building of parts plants and C.K.D. plants. Indonesia, who had restricted foreign capital earlier, changed its policy to attract foreign investment. Both elements began to promote BBC division of labour.

There were still several obstacles Japanese automakers faced under the new agreement: dematured industrial infrastructure, such as the materials industry; the medium materials industry; and the small parts industry. An inefficient physical distribution system was also a problem.

The negative elements all overshadowed the positive feature of low wage costs. Driven by the endaka situation, though, Japanese automakers and parts makers strengthened their involvement in this area and established a regional division of labour system by 1994. Japanese materials and medium materials manufacturers next went to Thailand and Malaysia, pushed by endaka and attracted by improvements in infrastructure, such as better ports and more options for plant locations, as well as a growing consumer market in Thailand of over 500,000. In addition it had appeared that Taiwan, who had supported the parts industry, would increase investment and support national complementation.

Nowadays, Japanese investment for the ASEAN area is concentrated in Thailand. Japanese automakers had already established C.K.D. plants in Thailand with local capital from joint ventures years ago. Japanese parts makers have since increased investment and the development of local parts suppliers. In the field of engine parts, Japanese automakers' mutual complement supply is just underway. Ideally located -- neighboring the large populations and relative liberalization of Vietnam, Burma, and south China -- Thailand can act as a backup base for the expanding motorcycle and vehicle market of southeast Asia. Honda already produces 700,000 small motor cycles in its Thailand plant. This is more than at its Kumakoto plants, the main motorcycle plant for Honda in Japan. The Thai plant will soon be able to produce one million vehicles, and Honda has plans to produce 100,000 passenger cars at a neighboring plant. Toyota, Mitsubishi and Nissan are also expanding plant capacity for passenger cars and commercial vehicles. Isuzu, with the highest production of commercial vehicles in Thailand, is also expanding its capacity to 100,000.

The Japanese automakers most advanced to construct an international division of labour in the ASEAN area are Toyota and Mitsubishi. Because of its earlier development in Thailand and Indonesia, Toyota has been able to construct a network for an international division of work for components and vehicles with Thailand, Malaysia and Indonesia; and soon the company will be able to add the Philippines and Taiwan. As for Mitsubishi, the automaker had stressed an ASEAN business deal with the Mitsubishishoji Trading Company because of its late start in doing business with North America and Europe. In Malaysia, Mitsubishi was successful with the *Proton-Saga* project and established a basic

production base in Thailand, as well as other independent production bases in Taiwan, Indonesia, the Philippine. Mitsubishi is also establishing a network for the division of labour for components and vehicles. (See charts 2 and 3.)

Toyota and Mitsubishi stress the importance of Australian business, and they are going to combine the ASEAN business with their Australian dealings. This kind of behavior is well suited to the Australian government policy for automotive liberalization and export promotion.

Following the lead of these two companies, Nissan has established an ASEAN international division of labour system for Taiwan, Indonesia and the Philippines, and has begun networking in Thailand and Malaysia. Honda and Mazda are strengthening their Thai production base and preparing for a network of international division of labour in the Philippines, Malaysia and Indonesia. In the case of Honda, the company is promoting its motorcycle and vehicle business, accompanied with its parts makers and regional international division of labour. Mazda's ASEAN strategy depends on Ford, its partner for Asia.

In strengthening their ASEAN strategy, Japanese automakers came to question the value of the "Asian Car." With the success of Toyota *Kijan* and estimated growth of low-cost vehicle demand, many Japanese automakers moved forward in designing and producing low-cost passenger cars and M.P.V. for the ASEAN area. But some worried that the name "Asian Car" connoted an image of a cheap car. So automakers are now going to commonize the platform of the low-priced world car and modify it to the needs of Asian customers, as they had done, for example, with the Toyota Corolla and Tarcel, the Honda Civic, and Nissan Sunny and A.D. van. This strategy, combined with a regional division of labour production merit, is expected to entice a large market.

Finally, it is worth noting that the possibility of B.B.C. division of labour production system is now being implemented among parts suppliers. (See chart 4.) In this direction, Nippon Denso, Nippon Hatsujo and Yazaki etc. are going to develop a division of labour production system in the ASEAN area and Australia. This trend is also an interesting topic.

IV. Conclusion:

Japanese auto manufacturers have had a difficult time with restructuring, and the fruit of these three years of restructuring has been offset by the rising yen. About ¥400 billion worth of restructuring has been lost over radically fluctuating exchange rates. Nevertheless, through this restructuring experience, Japanese automakers trimmed their fatty R&D and parts cost. They now wish to move forward with lean optimization, which combines a system of R&D, parts purchasing and production without large layoffs of key intelligent skilled workers on the shopfloor.

Through the reform of the R&D system, which has already started, shortened lead-time and decreased human-hour for development will continue to advance. Conceptualization may take more time, but product engineering and process engineering will be shorter. For production engineering, human-hour based productivity is going to improve gradually by combining low-cost automation with more humanized work contents. It's not so easy, however, to try to reduce costs at the factory level because the production line operating ratio is going down, with large cuts in car export and higher labour costs due to endaka.

The pursuit of lean optimization is difficult right now, but Japanese automakers' will continue their restructuring process. During this time, then, we shouldn't hinder their competitiveness with exclusionary tactics.

Japanese automakers who will pursue an optimum lean system need to incorporate their global strategy closely with their restructuring effort. Three strategies now employed are: decreasing some domestic production capacity by continuous restructuring; increasing overseas production in developed countries; and developing an international division of labour system in Asian market with high growth, while preparing a future horizontal division of labour. Only automakers who can lead this global business networking and establish optimum lean systems to facilitate domestic business restructuring will be winners in the tough game of business survival.

Bibliography

"Product Development Performance," Ellison, Clark, Fujimoto and Hyun;
Harvard Business School Working Paper, 1995

The Motor Industry of Japan, Japan Automobile Manufacturers'
Association.

General Situation of Automobile Industry, Toyota Motors, 1995.

The Motor Industry Handbook, Nikkan Jidosha Shinbunsha, 1994.

Thailand's Challenge to Industrialization, NAIC, Akira Suematsu and
Yasushi Yasuda Ed., 1985.

Kaigaitoyushi (Overseas Investment and Finance), Japan Export and Import
Bank, Association of Overseas Economic Cooperation. 1993.

Japanese Automobile Industry- A Business History, Koichi Shimokawa,
Athlone Press, 1994.

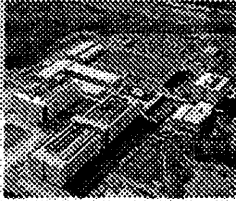
"Automotive R&D system in Japan: Specific Feature & Formation of
Simultaneous Engineering," Koichi Shimokawa.

"Development of the Asian NIES Automobile and Future Prospect of the
Global Division of Labour: Japan, R.O.K., China, Taiwan and Thailand," Koichi
Shimokawa, IMVP Paper, 1988

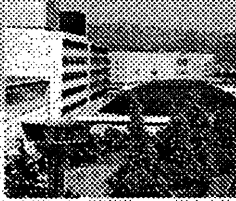
Nikkei Business: June 21, 1993 and Jan. 24, 1994.

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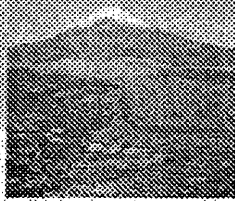
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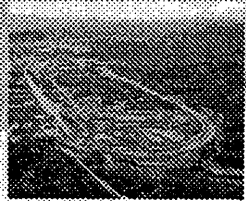
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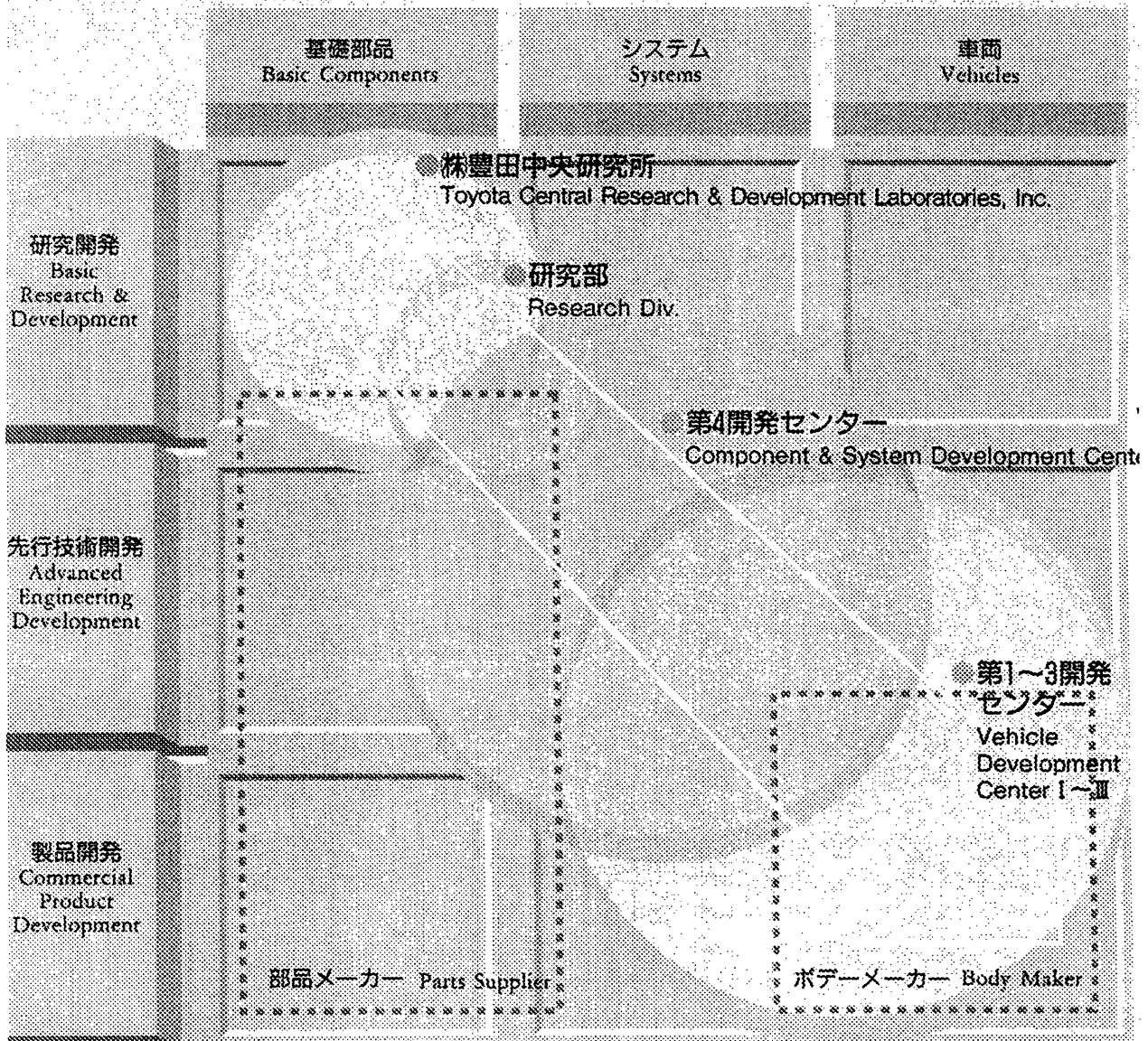
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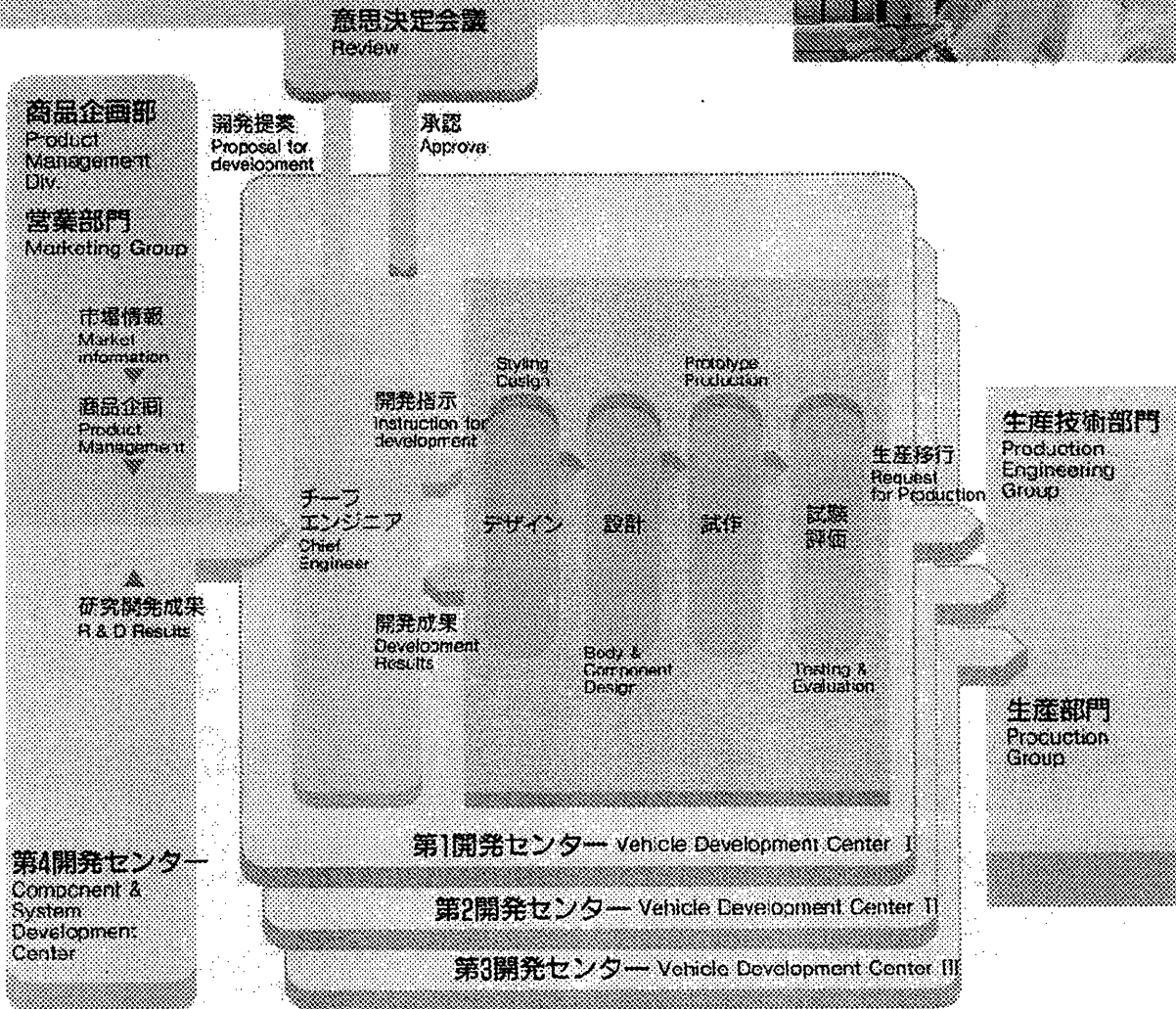
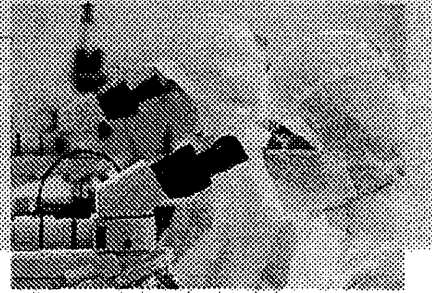


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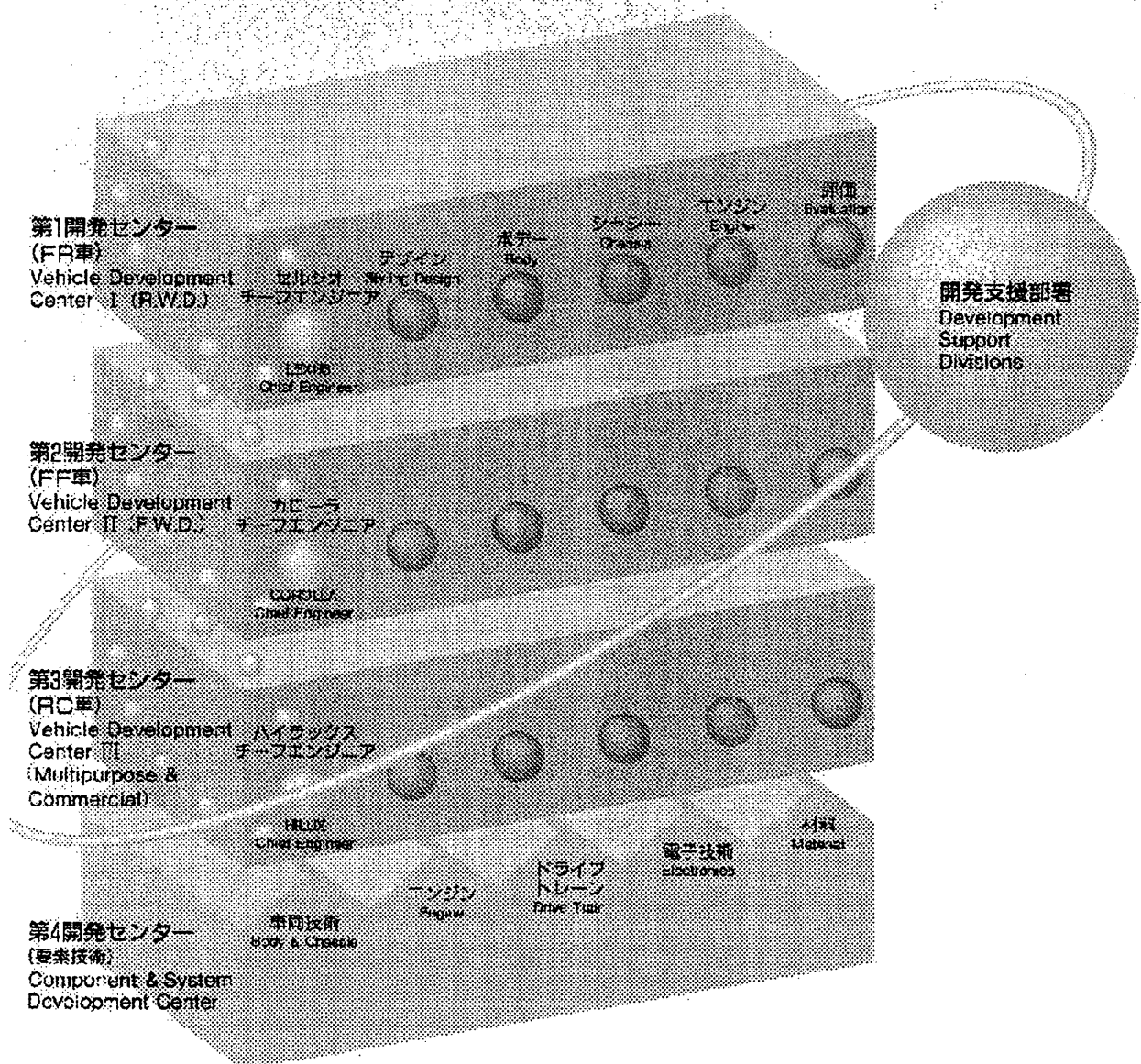


Table 1. Cost Cutting Program by 5 Japanese Auto Companies (1993 ~ 1996 Forecast)

Nissan	
Cutting Number of White Collar	4,000
Cutting Number of Worker'	1,000
Parts Commonization	
Decreasing Model Number	40%
Decreasing Number of Parts	40%
Plants Operation Ratio	85%
Total Cutting Expencc (1 Billion Yen)	200
Breakdown	
Cost of Parts	100
Labour Cost	25
Parts Commonization	30
Production Efficiency	10
Others	35

Honda	
Cutting Number of White Collar	900
Cutting Number of Worker'	0
Parts Commonization	
Decreasing Model Number	50%
Decreasing Number of Parts	50%
Total Cutting Expencc (1 Billion Yen)	60
Breakdown	
Cost of Parts	30
Labour Cost	10
Parts Commonization	10
Production Efficiency	5
Others	5

Mazda	
Cutting Number of White Collar	5,500
Cutting Number of Worker'	1,000
Parts Commonization	
Decreasing Model Number	40%
Decreasing Number of Parts	40%
Total Cutting Expencc (1 Billion Yen)	60
Breakdown	
Cost of Parts	30
Labour Cost	10
Parts Commonization	10
Production Efficiency	5
Others	5

Toyota	
Cutting Number of White Collar	2,000
Cutting Number of Worker'	0
Parts Commonization	
Decreasing Model Number	20%
Decreasing Number of Parts	30%
Total Cutting Expencc (1 Billion Yen)	260
Breakdown	
Cost of Parts	200
Labour Cost	20
Parts Commonization	20
Production Efficiency	10
Others	10

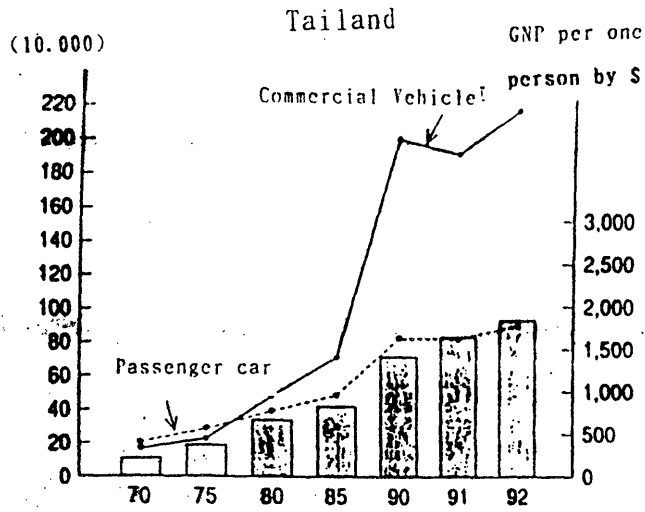
Mitsubishi	
Parts Commonization	
Decreasing Model Number	30%
Decreasing Number of Parts	20%
Total Cutting Expencc (1 Billion Yen)	40
Breakdown	
Cost of Parts	20
Labour Cost	0
Parts Commonization	10
Production Efficiency	5
Others	5

Table 2. Profit and loss factor by Japanese auto makers

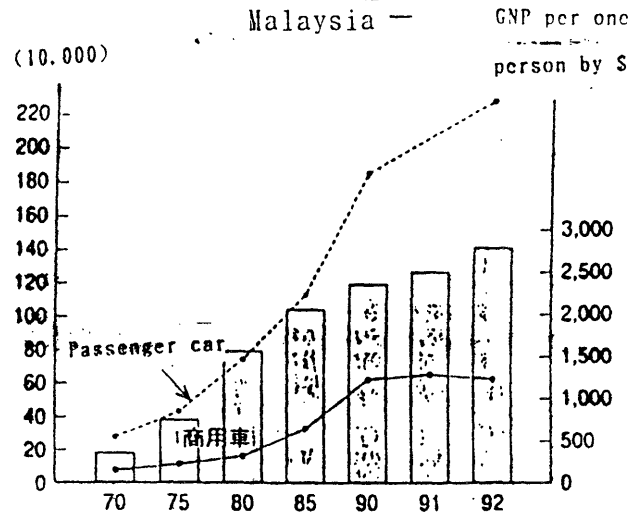
	Profit contribution factor				Profit decreased factor				Current profit loss
	Total	Rate contribution decreased car variations % VA·VE	Decreased 費 Depreciation	Cost cutting	Total	Currency exchange loss	Decreased sales	Increased wage cost	
Toyota (93/6)	1,600	1,000	340	260	1,812	1,200	300	312	▲212
Nissan (93/9) 中間	600	300	30	270	800	500	300		▲200
Honda (93/9) 中間	382	190	192		525	275	250		▲143
Mitsubishi (93/9) 中間	236	116	120		280	180	100		▲44
Mazda (93/9) 中間	530	100	430		750	300	450		▲220
Suzuki (93/9) 中間	111	76	7	28	128	76	0	52	▲17
Fuji (93/9) 中間	100	74	0	26	290	160	70	60	▲190
Daihatsu (93/9) 中間	121	19	14	88	72	53	19	0	49
Iino (93/9) 中間	73	36	37		86	21	48	17	▲13
Isuzu (93/10)	400	100	0	300	312	130	160	22	88
合計	4,153	2,011	2,142		5,055	2,895	2,160		▲902

Source: Mitsubishi Research Institute Data (100 Million Yen)

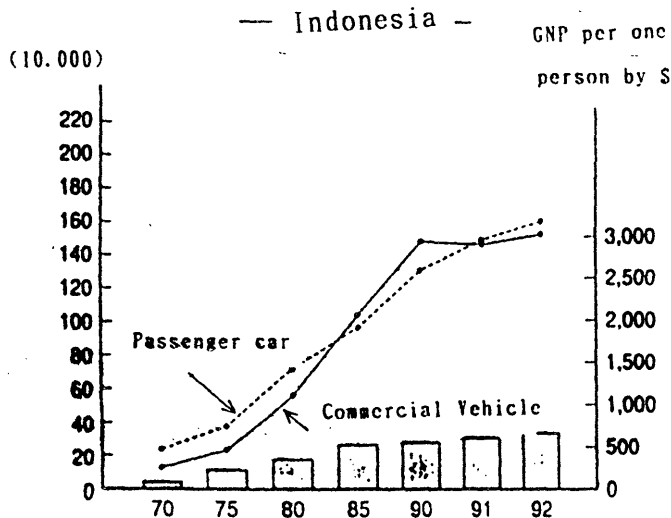
Chart 1. Trend of GNP and Car Ownership in ASEAN 4 Countries



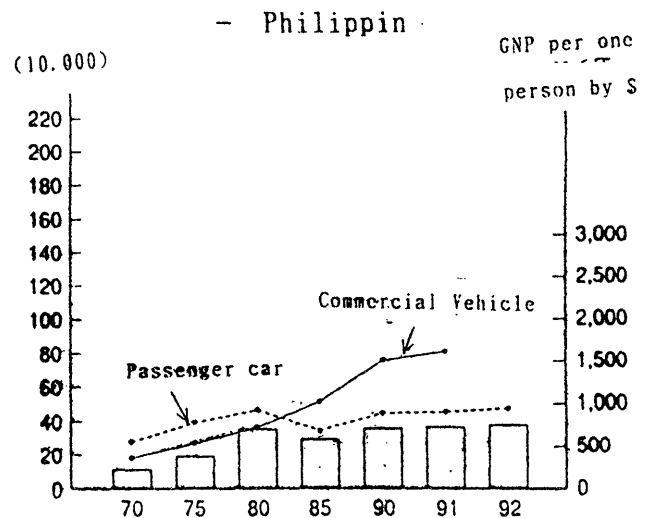
	GNP per one person by \$	Passenger car	商用車
70	200	204,076	167,903
75	350	296,049	233,564
80	670	397,000	483,900
85	830	484,550	702,232
90	1,420	826,606	1,987,259
91	1,650	825,072	1,902,437
92	1,840	890,821	2,125,632



	GNP per one person by \$	Passenger car	Commercial Vehicle
70	380	279,410	82,623
75	760	430,000	114,000
80	1,580	729,089	167,611
85	2,050	1,124,449	324,251
90	2,340	1,811,141	615,658
91	2,490	2,018,759	643,000
92	2,790	2,214,974	618,137

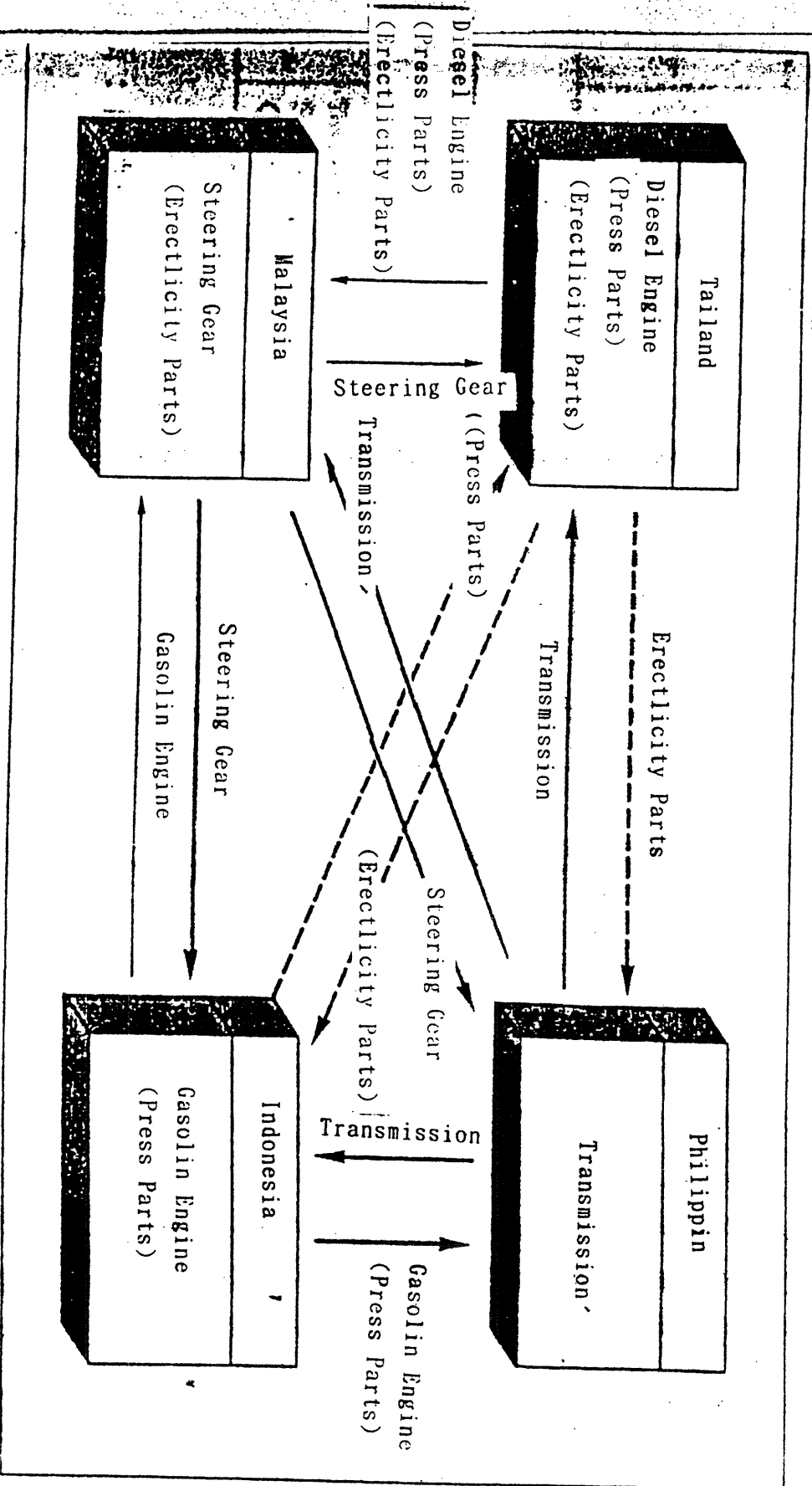


	GNP per one person by \$	Passenger car	Commercial Vehicle
70	80	238,632	125,552
75	220	383,061	231,519
80	450	729,517	564,232
85	530	965,245	1,040,265
90	560	1,293,835	1,477,988
91	610	1,475,947	1,455,101
92	670	1,574,806	1,513,845



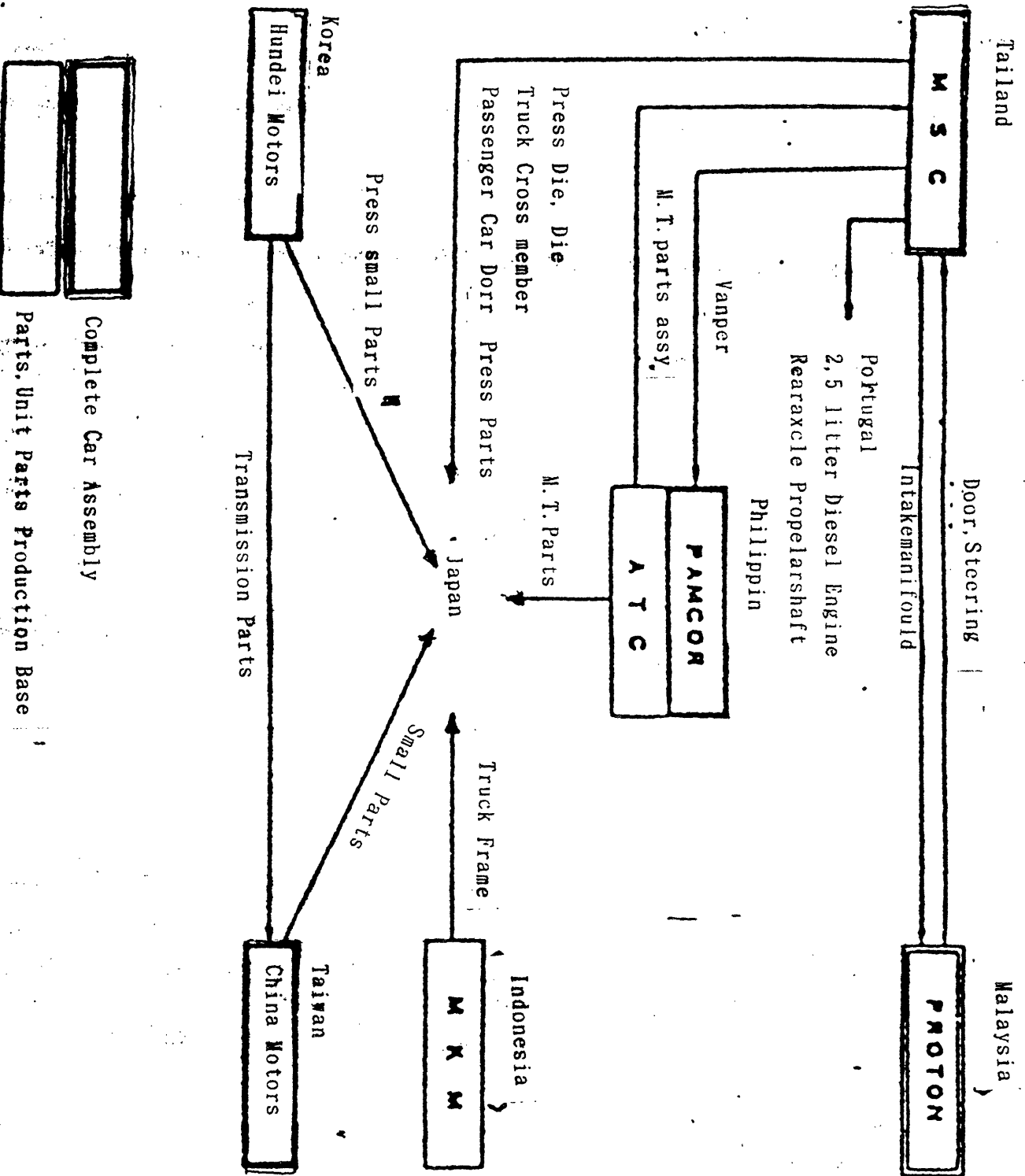
	GNP per one person by \$	Passenger car	Commercial Vehicle
70	210	279,172	179,445
75	380	399,571	272,303
80	710	478,586	374,519
85	600	359,900	521,407
90	730	454,554	764,917
91	740	456,606	827,676
92	770	483,622	n.a.

Chart 2. Outline of Toyota' Components Complementation Plan 1990



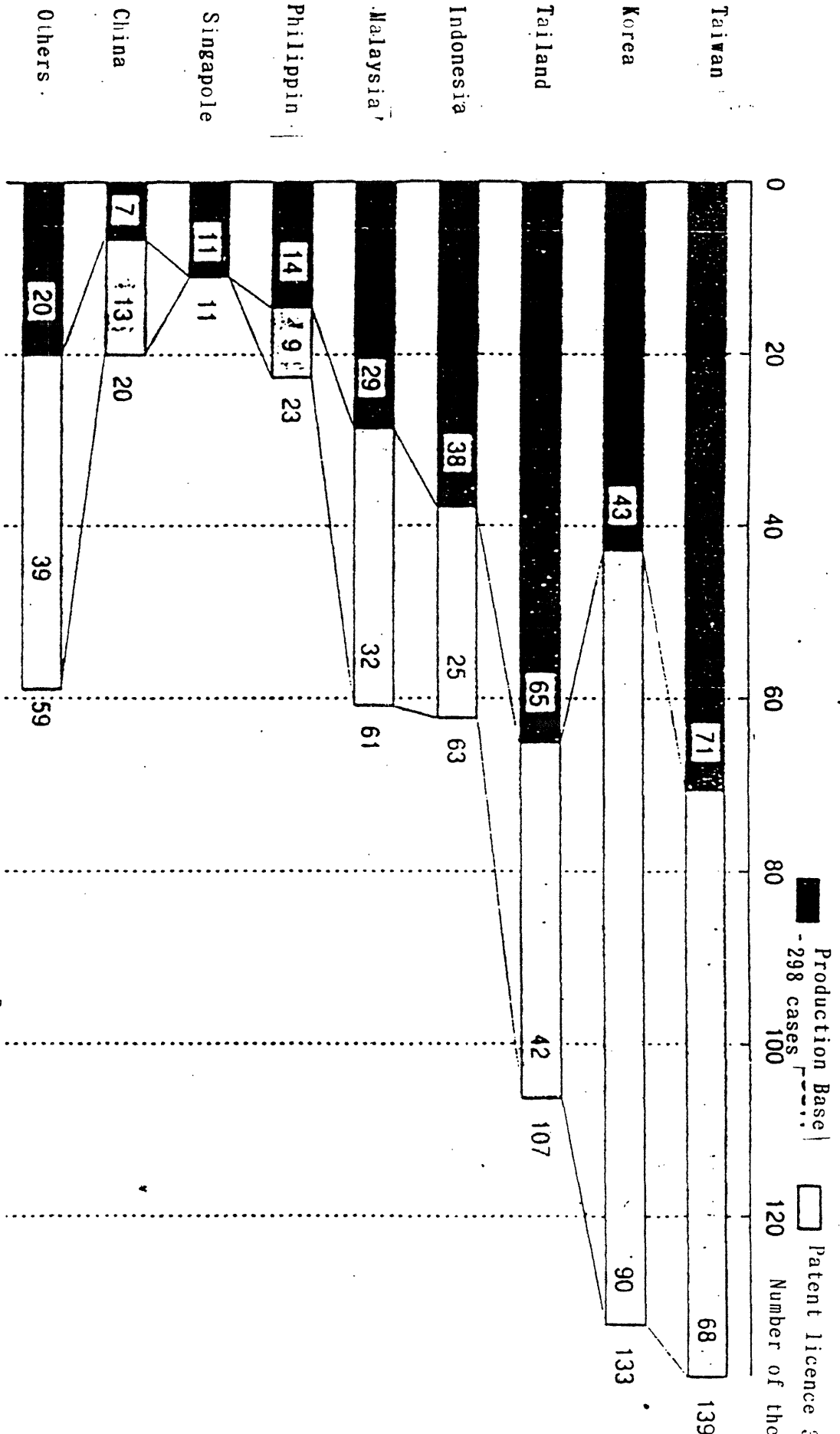
(Source) Toyota Motors, Automobile Market in Asia and Oceania. 1990p

Chart 3. Outline of Mitsubishi' Component Complementation in ASEAN.



(Source) Mitsubishi Research Institute, Automobile Industry Report 1994

Chart 4. Japanese Parts Suppliers' Presence in each country in Asia



	Taiwan	Korea	Thailand	Indonesia	Malaysia	Philippines	Singapore	China	Others	Total
<input checked="" type="checkbox"/> Production Base	71	43	65	38	29	14	11	7	20	298
<input type="checkbox"/> Patent Licence	68	90	42	25	32	9	0	13	39	318
Total	139	133	107	63	61	23	11	20	59	616

(Source) Ministry of International Trade and Commerce, Ministry of Economic Affairs, Republic of China (Taiwan)