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THE CAR INDUSTRY IN THE REPUBLIC OF KOREA

by

Sung-Hwan Jo



35270

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## Preface

This study on "The car industry in the Republic of Korea", has been prepared for the research project on "Adjustment to structural change in manufacturing: A North-South perspective" undertaken under the umbrella of the ILO's International Division of Labour Programme. Its author is Sung-Hwan Jo, Professor of Economics at Sogang University in Seoul.

The structure of world production and trade changes continuously, opening up new job opportunities and threatening existing ones. This process of change causes considerable adjustment problems affecting the lives of millions of workers and their families in both industrialised and developing countries. In view of their potentially far-reaching consequences these changes need to be analysed in depth. Critical issues should be identified in time. The different options (and their consequences) open to policy-makers and other concerned parties must also be examined. These are the principal concerns of the research undertaken by the ILO's International Division of Labour Programme.

In this situation of constant change, where causes and effects are often hard to separate, it is not easy to guess what the future will bring. Certain trends may be discernible but many uncertainties remain. It is particularly important - but often very hard - to recognise which changes are cyclical and which structural. To what extent is unused capacity and unemployment in a particular industry related to low overall demand and to what extent are long-term structural factors at work?

The developing countries play an important role in the process of structural change. Their share of world manufactured production and trade has increased in the last few decades. So far, most of this greater share originates in few countries only (the newly industrialising countries - NICs). At first, developing country exports tended to be concentrated in industries using little capital and relatively simple technology. Gradually, however, the range of their exports expanded and came to include steel, ships, machine tools, colour TVs, videotape recorders, petrochemicals, arms and aircraft.

In more recent years, protectionism and the use of new technologies have tended to slow down the advance of developing countries exports in certain product areas. This has allowed industrialised countries to regain ground in some "traditional" industries. But it has also encouraged developing country exporters to accelerate their move into the production and export of more sophisticated products. A situation appears to be emerging in which most industrial goods using mature technologies can be produced in a large number of (industrialised and newly industrialising) countries. Sectors that use and generate the very latest technologies are exceptions.

Capital has become increasingly internationally mobile and this has contributed to an acceleration of structural change. It has also made labour adjustments more difficult. Capital can be moved by telex, but people move more slowly. Workers need to adjust to changing circumstances, to be trained and retrained. But this takes time. It is therefore essential that the social partners and workers in particular are aware at an early stage of the scope and the consequences of the structural changes taking place and expected to take place. This will allow them to take timely action to reduce individual and social risk and the costs that these entail.

This research project takes as its point of departure the growing similarity among the issues related to industrial adjustment in industrialised countries, and those related to industrialisation in the more advanced developing countries. Two operational questions that the project tries to answer are: (1) to what extent has industry relocated from North to South; and (2) to what extent is this trend currently being arrested or reversed? It looks for the causes and consequences of this relocation process and attempts, through a comparison of four different sectors, to come up with general conclusions.

The project is organised at three levels:

1. Global studies on clothing, steel, automobiles and aircraft ask to which extent the industry has relocated, whether in more recent times this trend is being reversed, and what the underlying causes of the relocation process are. The four sectors chosen represent a wide range of industry characteristics: some are dominated by small and medium enterprises, others have predominantly multinational or public ownership; some use more labour intensive, others more capital or high-tech intensive methods of production; some are stagnating, others expanding. It is hoped that by taking industries which differ from each other in these respects (and so reflect the heterogeneous situation prevailing in many other industries) some more universally valid conclusions will emerge.

2. Selected case studies, focusing on the situation in one sector in one country, provide examples of how adjustment - successful or unsuccessful - has taken place in concrete cases. These studies compare different business strategies in the same sector; ask how workers have reacted to different strategies; and to what extent government policies have helped or hindered the adjustment process.

3. Conceptual studies

\* \* \*

This study recounts the recent phenomenal success of the motor vehicle industry in the Republic of Korea. If present growth rates are maintained the country will be the fifth largest car producer in the world by 1990. As little as seven years ago, the country had virtually abandoned the idea of promoting motor vehicle production as a strategic export industry for the 1980s, but thanks to growth rates of 20 per cent (1983-84), 42.6 per cent (1984-85) and 60 per cent (1985-86), it reached - in 1987 - a level of exports of passenger cars similar to or exceeding that of Italy or Sweden.

The industry consists of three main producers. The activities of two of these - Kia and Daewoo - are very closely woven into the global production structure of the two largest United States automobile multinationals. Sales in the United States take place through the existing network of these multinationals. The case of Hyundai, the largest producer, is different however, as it has taken a much more independent course and has set up its own overseas sales network through exclusive dealership arrangements. Hyundai is also the only producer that has reached the minimum efficient level for realising economies of scale for a single car model.

Hyundai was the best selling imported car in Canada in 1985 and 1986. Its success was due to good quality production at low cost, including labour costs, but also due to some "special" factors. It benefited from the import duty privileges related to its developing country status. It also had the

good fortune to enter the market when a demand boom coincided with "voluntary" export restraints (VERs) of Japanese producers. Such Japanese export restrictions also favourably influenced the firm's successful entry into the United States market.

The domestic content of passenger cars is in excess of 85 per cent. Local production of components has not ceased to increase. Nevertheless, the Republic of Korea car industry still depends heavily on imports for the supply of critical parts and components. The reliance on import of foreign technologies for its technical improvement is a drawback, the study argues, and there is an urgent need to improve the local research and development capacity.

The comparative advantage of producing low-cost subcompact cars has shifted from Western Europe in the 1960s, to Japan in the 1970s, and to newly industrialising countries (NICs) such as the Republic of Korea in the 1980s, the study states. These NICs have a relatively abundant well-educated and (semi-) skilled labour force and have managed to combine successfully mature technologies with low labour costs. These advantages, however, may not last. Production costs will increase as wages rise and the revaluation of the won (against the US dollar) continues. Higher import barriers can be expected in North America. This, the study argues, will make it imperative for Republic of Korean automakers to set up more production facilities abroad and to diversify into the export of high quality compact and medium-sized cars.

As their name indicates, working papers are an intermediate form of presenting research findings. Any comments provoked by this paper are therefore most welcome.

Gijsbert van Liemt

Contents

	<u>Page</u>
I. A brief review of development process of the Korean car industry and government policies (1962-87) .....	1
II. The performance of the Korean car industry .....	6
1. Output performance .....	6
2. Automotive technology .....	9
3. R&D efforts .....	11
4. Supply of components and materials .....	14
5. Future projections .....	16
III. International involvement and competitiveness of the Korean car industry .....	20
1. Inflow of technology and capital .....	20
2. Export marketing and competitiveness of the big three Korean automakers .....	22
IV. Corporate strategies and industrial relations .....	30
1. International alliance strategy .....	30
2. Sourcing .....	31
3. Product mix .....	32
4. R&D strategy .....	32
5. Management-labour relations .....	33
V. Factors in international expansion of the Korean car industry .....	37
1. Supply-side factors .....	37
(a) The low labour cost of production .....	37
(b) Economies of scale and learning effects .....	41
(c) Growth of the related industries .....	42
2. Demand-side factors .....	42
(a) Similarity in structure of demand for small cars between local and overseas markets .....	42
(b) Increase in local demand .....	43
VI. Problems ahead .....	45
1. Danger of overcapacity .....	45
2. Backwardness of component suppliers .....	46
3. Technical constraints .....	47
4. Danger of import restrictions .....	48
5. Risks from changing overseas demand and capital requirement .....	49
Appendix Table A-1: Output performance of Korea's motor vehicle industry .....	51
References .....	52

## I. A Brief Review of Development Phases of the Korean Car Industry and Government Policies (1962 - 1987)

The Korean car industry has passed through several distinct phases of development and setback in the last quarter century.

The first phase(1962 - 66) was started with the establishment in 1962 of the two forerunners of automobile assembling companies, Saenala and Hadonghwan, which were later dissolved or merged into other companies. Prior to 1962, a small number of new and second-hand cars had been imported under heavy custom duties and prohibitive consumption taxes. The industry in this initial phase could be considered as a typical "import - processing" industry in the sense that the semi-knocked-down components imported from foreign car manufacturers were locally assembled at final stage of production. The industry was thoroughly protected under the Motor Vehicle Industry Protection Law enacted in 1962, an elaborate protectionistic scheme that virtually prohibited the importation of assembled vehicles and of foreign parts and components not related to assembling uses. In 1964, Sinjin Motor Vehicle Industrial Company was established. This new company started two years later to assemble the basic Toyota subcompact model, Corona, under licensing arrangements with Toyota of Japan. In 1965, Asia Motor Company was established and began to negotiate with Fiat of Italy for technological licensing arrangements.

The second phase (1967 - 71) could be marked by the beginning of local production of some parts and components previously imported from foreign manufacturers. The Korean car industry was gradually turned into an "import-substitution" industry in the sense that local production of complete knocked-down parts and components was pushed to as great extent possible and that division of labor and specialization was encouraged among local suppliers of parts and components under the Basic Plan for Promotion of Motor Vehicle Industry proclaimed in 1967. Hyundai Motor Company was

established in 1968 and started to assemble Cortina, the basic English Ford subcompact model, with imported and domestically produced parts, under licensing arrangements with Ford Motor Company of England. In 1970, Asia Motor Company began to assemble Fiat 124. In the same year, Kia Industrial Company which had been established as a bicycle manufacturer in 1940's began to assemble small-sized pick-up trucks under licensing arrangements with Toyogogio Company (Mazda.) of Japan. By the end of 1971, the five automakers, namely, Hadonghwan (later renamed as Dong-A), Shinjin, Asia, Hyundai and Kia, were engaged in assembling passenger cars and commercial vehicles with imported and locally produced components and parts. The percentage share of locally produced parts in total value added was around 50% in 1971.

The third phase (1972 - 76) was characterized by the development of "indigenous" models of passenger cars which was promoted under the Long-Term Plan for Motor Vehicle Industry Promotion drawn up by the Korean Government in 1973. GMC - Korea (GMC) (the forerunner of Daewoo Motor Co.) was established as a 50:50 joint-venture company between Shinjin and General Motor Company in 1972. This joint-venture company started to assemble Chevy 1700, a Korean variant of the subcompact model originally developed by the German GMC subsidiary (OPEL). In 1974, Kia which had taken over Asia, started to assemble small subcompacts, BRISA, under licensing arrangements with Toyogogio of Japan, the manufacturers of Mazda models. In 1975, Hyundai introduced Korea's first indigenous model, PONY, and GMC-Korea began to market Gemini, a Korean variant of the GMC world-car model initially developed by OPEL (Germany) and improved by Isuzu (Japan). By 1976 the proportion of local content of passenger cars assembled by the three car manufacturers, GMC-Korea, Kia, and Hyundai, reached around 85 percent. It was during this period when the Korean Government began to promote division of labor and specialization between automakers and component suppliers and among suppliers. Such a policy was incorporated into the Laws Governing the Promotion of Small-Medium Industry Specialization enacted in 1975.



The fourth phase (1977 - 82) can be marked as a period of restructuring and transition towards mass - production system of the Korean car industry.

Local demand for passenger cars and commercial vehicles began to grow rapidly from the second half of the 1970's. More than 200 thousand units of motor vehicles were produced and about 30 thousand units were exported during 1979. The car industry expanded its productive capacity to meet rapidly increasing local demand for passenger cars. In 1979, the government designated the car industry as one of the ten strategic industries to be promoted in the 1980's and selected 228 enterprises as the "officially approved" suppliers who would specialize in production of 59 major auto components and parts.

The second-oil crisis at the end of the 1970's hit hard the Korean car industry. Local demand for cars fell sharply, plant utilization rate went down, and inventories accumulated. The government and the car industry in this politically uncertain (after the assassination of President Park) and economically depressed period between 1979 and 1981 almost abandoned any idea of promoting the car industry as a strategic export industry for the 1980's. Between 1980 and 1981, the government and the car industry took a series of measures to restructure and rationalize the car industry. The final outcome for restructuring the motor vehicle industry worked out between the government and automakers was as follows : (a) both Hyundai and Daewoo (GMC-Korea)\* were to manufacture passenger cars (Kia would be permitted to manufacture passenger cars after five years) ; (b) Kia alone was to manufacture light-weight trucks under 5 tons ; and (c) all the existing three automakers (Hyundai, Daewoo, and Kia) were permitted to manufacture heavy-weight trucks and buses ; and such restrictions would be removed at the end of five years and then free entry would prevail.

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\* Daewoo replaced Shinjin as the Korean partner of GMC-Korea in 1978, and subsequently this 50:50 joint-venture company changed its name from GMC-Korea to Daewoo Motor Corporation.

The current phase (from 1982 to the present) can be considered as the period for consolidating and expanding the export base for the Korean car industry. From the second half of 1982, the car industry was phased out of the severe and prolonged recession. The sales of motor vehicles reached 220,000 units, a record-breaking sales, in 1983. Hyundai's successful exports of PONY II, an improved model of Pony, to the Canadian market which had began in 1983 was a decisive turning point in Korea's car exports. The exports of Korean passenger cars increased from 16,340 units in 1983 to 48,630 units in 1984, to 119,099 units in 1985 and again to 298,702 units in 1986. When the export targets set by the three automakers for 1987 are added up, the total would reach around 700,000 units.

Hyundai's entry into the U.S. market with its new front-wheel drive PONY EXCELL in 1986 proved a phenomenal success. Hyundai sold 168,000 PONY EXCELL's and its variants in the U.S. market for 1986 and has set target sales of more than a quarter million cars in the U.S. market for 1987. The company's productive capacity expanded from the existing capacity of 400,000 cars/year to 700,000 cars/year by the end of 1987.

Daewoo, a joint-venture company with General Motor Company, introduced its own version of the world car, LEMANS, to local market in 1986 and began to export LEMANS to the U.S. market through the Pontiac distribution channels from the middle of 1987. Daewoo is planning to sell somewhere between 80,000 and 100,000 cars in the U.S. market by the middle of 1988. The company is doubling its existing capacity of 170,000 cars/year.

Kia which had developed a subcompact model jointly with Toyogogio introduced its local model, PRIDE, to the local market in February, 1987. The export model of Kia's subcompact, FESTIVA, which is identical to PRIDE, was introduced in the U.S. through the Ford distribution channels from the second half of 1987. The company is planning to sell about 40,000 units of FESTIVA in the U.S. in the initial year. Kia is also

expanding its productive capacity from the level of 120,000 unit/year to that of 150,000 units/year, and has a medium-sized (compact) car model called CONCORD to local market introduced.

Tong-A motor Company which had been producing Jeeps for local market was recently acquired by Ssangyong group. The company is developing a wagon-type model of passenger car to be introduced in local market sometime before 1990. The company is also planning to export buses and trucks under licensing arrangements with Japanese (Nissan) and European automakers in near future. It recently acquired Panther, a small British automaker, to serve as a European base for passenger car export and automobile technology import.

More than 800 component suppliers are producing auto parts and components for local manufacturers and foreign suppliers. Many of these suppliers have joint-venture and/or technological licensing and subcontracting arrangements with foreign partners for quality improvement and overseas export expansion.

In promoting the exports of passenger cars, the Korean government does not offer any special export incentives to the motor vehicle industry. It offers the same incentives to the passenger car exports as those to any other industrial exports, including tax reduction, exemptions from custom duties on imported materials, loans, and export insurance.

## II. The Performance of the Korean car Industry

### (1) Output Performance

The relative position of the Korean motor vehicle industry \* (including part suppliers) in the Korean economy is summarized in Table II-1. As of the end of 1984, the latest year for which the manufacturing census data are available, the motor vehicle industry occupies 2.8 percent in manufacturing employment and about 3.5 percent each in manufacturing output and value added, respectively. The percentage figures must have much risen after 1984. Such statistics do not reveal the dynamic aspects of rapid transformation taking place in the industry in the last several years. As the Korean economy from the second half of 1982 came to recover from prolonged and severe recessions related to oil shocks, subsequent world-wide recession, and domestic political uncertainty, the Korean motor vehicle industry gradually recovered from a near collapse of local market for motor vehicles. As shown in Table II-2, the output of motor vehicles grew rapidly to meet growing local demand and explosive overseas demand in subsequent years. Output grew by nearly 20 percent between 1983 and 1984, by 42.6 percent between 1984 and 1985, and by nearly 60 percent between 1985 and 1986, respectively. Between 1983 and 1986, Korea's exports of passenger cars and commercial vehicles increased from 25,000 units in 1983 to 306,000 units in 1986, a twelvefold increase. Such an explosive increase in car exports raised the share of passenger cars in total output of motor vehicles to 75 percent by the end of 1986. \*\*

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\* The motor vehicle industry in this paper covers production of passenger cars, trucks and buses, whereas the car industry refers only to car production.

\*\* A detailed breakdown of the output performance of the motor vehicle industry is presented in Appendix Table A-1.

Table II - 1 The Position of Korea's Motor Vehicle Industry  
(As of the end of 1984)

	Number of Establishments (1,000)	Number of Employees (1,000)	Output ( million won)	Value Added (million won)
Manufacturing sector	41.5 (100%)	2,349.6 (100%)	71,305.4 (100%)	24,654.4 (100%)
Machine tool Manufacturing Sub-Sector	10.4 (25.2%)	708.7 (30.2%)	19,374.3 (27.2%)	7,339.0 (29.8%)
Motor Vehicle Industry	.676 (1.6%)	64.6 (2.8%)	2,946.8 (3.5%)	832.0 (3.4%)

Sources : Mining and Manufacturing Census (Economic Planning Board, April, 1986)

Table II - 2 Output Performance of Korea's Motor Vehicle Industry  
(Unit : Thousand)

year	1983	1984		1985		1986	
output	221	265	(19.9%)*	378	(42.6%)	602	(59.3%)
local use	195	210	(7.7%)	246	(17.1%)	295	(20%)
export	25	52	(108%)	123	(136.5%)	306	(148.9%)

Source : Korea Automotive Industry Co-Operative Association

Note \* : Figures in parantheses are rates of increase over previous year

Stimulated by growing local demand for cars and by record-breaking car exports, the three existing automakers, Hyundai, Daewoo, and Kia are all expanding their existing productive capacity. As shown in Table II-3, the combined output of passenger cars produced by these automakers jumped from 66.6 thousand units in 1981 to 455.3 thousand units in 1986. As of the end of 1986, Hyundai, the industry's leader, delivered nearly 90 percent of the industry's total output, and Daewoo picked up the

Table II - 3 The Output of Passenger Cars by the Three Major Automakers

(unit : car)

Name of Firm	1981	1982	1983	1984	1985	1986	1) 1987
Kia	4,753 (7.1)	535 (0.6)	136 (0.1)	—	—	26 (0.0)	85,000
Daewoo	8,888 (13.3)	14,855 (15.9)	27,406 (22.7)	33,876 (21.6)	36,805 (14.0)	47,082 (10.3)	150,000
Hyundai	52,961 (70.6)	78,071 (83.5)	83,015 (77.2)	123,110 (78.4)	225,970 (86.0)	408,177 (89.7)	450,000
Total	66,602 (100.0)	93,451 (100.0)	120,557 (100.0)	156,986 (100.0)	262,775 (100.0)	455,285 (100.0)	685,000

Source : Korea Automotive Industry Co-operative Association

Notes 1) : The 1987 figures are the targets set by individual automakers.

remaining 10 percent. Kia just entered the market for passenger cars from the beginning of 1987. During the first half of 1987, Hyundai increased the productive capacity of its Ulsan assembly plant by 300 thousand cars/year to the total capacity of 700 thousand cars/year. The company is looking for a second plant site near Seoul to increase its total assembling capacity up to the level of one million cars/year by 1989 or 1990. In addition, Hyundai is constructing its subsidiary in Canada. The company is also developing a new medium-sized car model called "y-2". Daewoo is doubling its Lemans plant capacity from the existing level of 160 thousand cars/year to 330 thousand cars/year. Kia, which was once bankrupt but reorganized later through the ownership take-over (90% of total shares) by its employees, introduced a smaller subcompact car named PRIDE in local market (FESTIVA in the U.S. market) from early 1987 after a phenomenal success in sales of small vans and trucks in local market.

Dong-A Motor Company, a newly acquired subsidiary of Ssangyong group, is expected to introduce its wagon-type passenger cars sometime before 1990.

As shown in Table II-4, not only car exports expanded from 16.4 thousand cars in 1981 to nearly 300 thousand cars in 1986, but also the exports of automobile parts and components by hundreds of suppliers jumped from US\$66.2 million in 1981 to US\$164.5 million in 1986.

Table II-4 Exports of Passenger Cars and Automotive Components

unit : Passenger cars : car  
Automotive parts : US\$ 1,000

year firm	1981	1982	1983	1984	1985	1986
Kia	823	380	—	—	—	26
Daewoo	155	114	288	444	516	712
Hyundai	15,199	13,753	16,052	48,186	118,583	297,964
Total	16,177	14,067	16,340	48,630	119,099	298,702
Automotive parts	66,212	67,511	73,729	107,655	148,951	264,549

Source : Korea Automotive Industry Co-operative Association

## (2) Automotive Technology

The over-all level of automotive technology in Korea is at present far below that in the U.S., Japan and Western European countries despite ever-increasing import of technological know-how and assistance from the advanced countries and indigenous efforts toward automotive technology development. The Korean automakers are "nearly" competitive with their advanced-country counterparts in manufacturing technology, but lag far behind them in design technology for engines and other major components.

Table II-5 summarizes a self-evaluation of the Korean automakers' manufacturing technology.

Table II-5      The Evaluation of Passenger-Car Manufacturing Technology

<u>Process</u>	<u>Technical Level</u>	<u>Areas of Deficiencies</u>
Product design	C	CAD System application, technical knowledge of body structure
Die-casting and Forging	B	Reduction of losses, production automation, heat treatment
Pressing, milling, etc.	B	Precision molding, FMS technology
Heat treatment	B	Heat treatment of special materials energy-saving technology
Soldering technology	B	Production automation including robotics
Painting	A	Work by robots
Assembling technology	A	Assembling automation
Inspection system	B	Safety inspection, noise testing

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Sources : Own surveys of the Korean Automakers

A : The advanced - country level

B : Between the advanced and the competitor countries

C : The competitor - country level

The Korean car industry is also very weak in areas of heat treatment technology and new material development. Such a basic weakness in designs and material technology in Korea is quite serious in view of the recent trend in the advanced countries (the U.S. and Japan) toward developing new light-weight materials and wide-spread incorporation of electronic devices into automotive components. In areas of product quality, Korean automakers are also far behind their advanced-country counterparts.

The level of fuel economy of the Korea-exported subcompact cars (Pony Excell, Lemans, and Festiva) is far above the minimum standards set in the U.S. and Japan and is comparable with the Japanese subcompact cars such as Nissan Centra and Honda Civic.

The Korea-exported subcompact cars passed the EC and Canadian standards for gas emission control, but have so far failed to meet the U.S. and Japanese standards. The



Korean cars exported to the U.S. are equipped with imported emission control devices.

Korean passenger cars have passed the EC and Canadian safety standards and all those cars exported to the U.S. have passed the U.S. safety standards.

As to durability test, the Korea-exported passenger cars are considered to be slightly below the international standards mainly due to low-quality plating, painting and coating jobs and substandard heat-treatment technology.

Most Korea-exported cars are of front-wheel drive type and all the new models to be introduced for local and export market will also be of front-wheel drive type.

### (3) R & D Efforts

The Korean car industry from its inception in 1962 has been relying on foreign automotive technology imported through licensing agreements and/or joint ventures for which an ever-increasing amount of royalty payments has been made. It is the continuous inflow of technological know-how from the advanced countries that the gap between the local and the foreign technical levels has been gradually narrowed. It is through adaptation of the imported technology to mass production system that technical know-how, skills and workmanship have greatly accumulated in the Korean car industry and its supporting industries. A consensus among automotive industry experts is that, except in the area of design technology which the advanced countries have not much transferred to Korea, the Korean car industry has, by and large, assimilated and improved over the imported automotive technologies.

Tables II-6 and II-7 show an upward trend in the inflow of automotive technology through licensing agreements and joint ventures. Most notable in these tables is a sharp increase since 1984 in licensing arrangements and joint-ventures between local suppliers of components and their foreign partners. Table II-8 shows that the Japanese are the predominant foreign licensors and joint-venture partners.

Table II-9 shows R&D expenditure as percentage of sales value in the Korean car industry since 1984. The percentage increased from 2.3 percent in 1984 to 3.4 percent in 1986, and is projected to remain around 3 percent through 1990.

The total stock of R&D manpower and expertise in the Korean car industry is small at present, largely because the industry has heavily relied on the import of foreign technologies for its technical improvement. It is only in very recent years that Korean car industry has made a really serious effort to develop and secure R&D manpower resources. About 2,200 R&D workers are currently employed in nine research institutes established by individual Korean automakers and automotive component suppliers.

No government or semi-government automotive research institute is in existence. Investment expenditure made by Korean automakers for high-tech R&D activities in the areas of new basic materials development, electronic system and controls, alternative engines, emission controls, and others is quite meager. At the present moment, it is beyond the financial and technical capability of private enterprises to undertake

Table II-6

Annual Inflow of Technological Licensings by Car  
Manufacturers (Number of Cases)

firm year	1981	1982	1983	1984	1985	1986 *	Total
Kia	0	2	1	2	1	1	9
Daewoo	1	0	2	6	2	2	13
Hyundai	3	4	5	7	4	3	26
Total	4	6	8	15	9	6	48

Sources : Korea Development Bank

Notes \* : The 1986 figures cover the number of cases up to April 30, 1986.

Table II-7

Annual Inflow of Joint Ventures and Technological Licensing Agreements  
for Production of Automotive Components (Number of Cases)

year	Joint Venture	Technological Licensing
1980	1	6
1981		10
1982		10
1983		8
1984	3	14
1985	7	22
1986 *	10	90
total	21	160

Source : Korea Development Bank

Note \* : Estimates

Table II-8

Nationality of Joint-Venture Partners & Licensors  
in Production of Automotive Components (1980-1985)

Nationality	Joint Venture	Technological Licensing
Japan	4	44
U. S. A.	5	7
England	1	9
W. Germany	1	9
Switzerland	0	1

Source : Korea Development Bank

Table II-9

The Current State and Projection of R & D Investment  
by Motor Vehicle Manufacturers

(Unit : billion won)

	1984	1985	1986 (plan)	1990 (Projection)
R&D Investment (A)	40	61	98	170
Sales Value (B)	1,700	2,200	2,900	5,800
A / B (%)	2.3	2.8	3.4	2.9

Source : Korea Development Bank

Notes 1) The 1990 figures are expressed in the 1986 prices.

high-tech research activities. Many industry experts are stressing the need for the creation of public research institutes with sufficient funding and technical staffing which will join forces with private research units in development and application of high-level technology in automotive and related industries.

(4) Supply of Components and Materials

Assembling plants and equipment of the Korean car manufacturers are largely new and in good conditions mainly because a decisive expansion of their productive capacity took place in recent years. Plants and equipment owned and operated by hundreds of automotive component suppliers are largely out-dated and in poor conditions. As of the end of 1985, 817 supplier firms were producing automotive parts, components, and accessories. 93.9 percent of these suppliers fall into the category of small-medium enterprises, and the remaining 6.7 percent into that of large enterprises, as shown in Table II-10.

Table II-10

The Breakdown of Component Suppliers by Number  
of Employees (As of the end of 1985)

(unit : person)

Number of Employees	below 50	51-100	101-400	401-700		701-1000	above 1001
Number of Firms	395	165	186	16	*) 18	12	25

Sources : Korea Automotive Industry Co-Operation Association

Notes \*): Among firms with 401-700 employees, 18 firms with assets worth more than 12 billion won were classified into large firms

One can note from Table II-11 that the Korean car industry as a whole depends heavily on import for supply of critical parts and components despite ever-expanding local production and exports of auto parts and components. As of the end of 1985, Korea imported more than exported auto parts and components in the ratio of two to one. The degree of self-sufficiency in the car industry, measured in terms of the ratio of net import (import - export) to the sum of local production and net import is about 87.24 percent.

Table II-11

Output, Exports and Imports of Automotive Parts and Components  
(for passenger cars, buses, and trucks)

(unit : US \$ 1,000)

	1983	1984	1985
Output	926,461	846,701	1,199,169
Exports	73,729	107,665	148,951
Imports	339,821	330,821	301,459

Sources : Korea Automotive Industry Co-Operative Association

## (5) Future Projections

According to a study released in 1985 by Korea Institute for Economics and Technology (KIET), the output of motor vehicles in Korea is projected to grow at an annual average rate of 14.7 percent for the period between 1984 and 2000, far surpassing the projected rate of annual average growth of 8.6 percent of the manufacturing sector as a whole for the same projection period. In other words, the motor vehicle industry was projected to make contributions to growth of GNP and exports twice as much as the manufacturing sector as a whole for the remainder of this century, as shown in Table II-12. Table II-13 shows that the industry's share in GNP, manufacturing output and exports was projected to increase from 1.31 percent, 3.64 percent and 0.67 percent, respectively, in 1983 as a base year, to 2.9 percent, 6.6 percent and 3.3 percent, respectively, in 1990, and again to 4.2 percent, 8.6 percent, and 5.3 percent, respectively, in 2000. These percentage figures projected by KIET seem to be on a much conservative side, considering the ever-expanding export and local demand for Korea-made passenger cars in recent years.

The Korean car industry is still in its infancy in export business and is suffering from a host of weaknesses in high - tech areas, overseas marketing expertise, consumer-credit arrangement, and so on. The world economic outlook in general and the prospective overseas demand for passenger cars in particular are by no means optimistic. Under these circumstances, it is hazardous to make a long-term projection for the future demand for and supply potentials of the Korean car industry. Judging from the initial success in sales of Hyundai's PONY II in the Canadian market, a phenomenal success of Korean subcompacts (PONY EXCELL and LEMANS) in the U.S. market, and a steady upward trend in local market demand for passenger cars and commercial vehicles, one can safely say that the prospect for Korea's motor vehicle industry is, by and large, promising at least up to year 1990.

The long-term demand forecast presented in Table II-14 was based on production plans submitted by individual automakers and the demand forecast made by Korea Automotive Industry Co-Operative Association. The total demand for passenger cars, buses, and trucks was projected to grow from 369 thousand units 1985, to 600 thousand units in 1986, to 980 thousand units in 1988, and to 1,320 thousand units in 1990. This means that the total demand is to grow at an annual average rate of 29 percent for the period between 1985 and 1990. The exports of passenger cars were projected to grow at an annual average rate of 44.1 percent from 119 thousand units in 1986 to 740 thousand units in 1990. The exports of buses and trucks were projected to grow at an annual average rate of 49.6 percent between 1985 and 1990. Local demand for passenger cars was forecast to grow at an annual rate of 20.1 percent, and that for buses and trucks at an annual rate of 13.8 percent.

Table II-12

Growth Rates and Contributions of  
The Motor Vehicle Industry

(unit : %)

		Annual average rate of growth		Contributions to GNP and Export growth	
	Period	Value Added	Export	GNP	Total Export
Motor Vehicle Industry	1971 - 1983	13.4	49.8	1.7	0.7
	1984 - 2000	14.7	28.9	5.6	5.9
Manufacturing Sector	1971 - 1983	15.4	30.9	48.1	93.9
	1984 - 2000	8.6	12.6	51.4	72.1

Sources : Korea Institute for Economics and Technology

Table II-13      The Relative Position of the Motor Vehicle Industry (unit : %)

	1983	Projections	
		1990	2000
Share in GNP 1)	1.31	2.9	4.2
Share in Manufacturing Output 1)	3.64	6.6	8.6
Share in Total Export 2)	0.67	3.3	5.3

Sources : Korea Institute for Economics and Technology

Notes 1) : 1980 constant prices

2) : current U.S. dollar prices

Table II-14      Long-Term Projections of Demand for Motor Vehicles (unit : 1,000 units)

		1988 base year	1986	1988	1990	1985 - 1990 average growth rate (%)
Passenger Cars	local demand	136	165	230	340	20.1
	exports	119	285	540	740	44.1
	total	255	450	770	1,080	33.5
Buses & Trucks	local demand	110	143	180	210	13.8
	exports	4	7	15	30	49.6
	total	114	150	195	240	16.1
Total	local demand	246	308	425	550	17.5
	exports	123	292	555	770	44.3
	total	369	600	980	1,320	29.0

Sources : Korea Development Bank



Table 11-15 The Existing and Projected Productive Capacity  
of Motor Vehicle Manufacturers

(unit : 1,000 units)

	1985	1986	1988	1990
Hyundai	440	600	750	1,100
Daewoo	90	248	388	420
Kia	133	268	304	438
Dong-A	8	15	30	30
Asia (Kia)	14	24	24	50
Total	685	1,155	1,496	2,038

Source : Korea Development Bank

Table II-15 summarizes the existing and planned productive capacity of the individual Korean automakers. The supply capacity for motor vehicles is expected to reach 1.52 million units/year by 1988, and to reach 2 million mark by 1990. The productive capacity of Hyundai alone would exceed one million cars/year. The sum total of the planned productive capacities of the existing five automakers (2,038 thousand units as shown in Table II-15) would exceed by 700 thousand cars/year the sum total (1,320 thousand units as shown in Table II - 14) of the projected export and local demand by the year 1990.

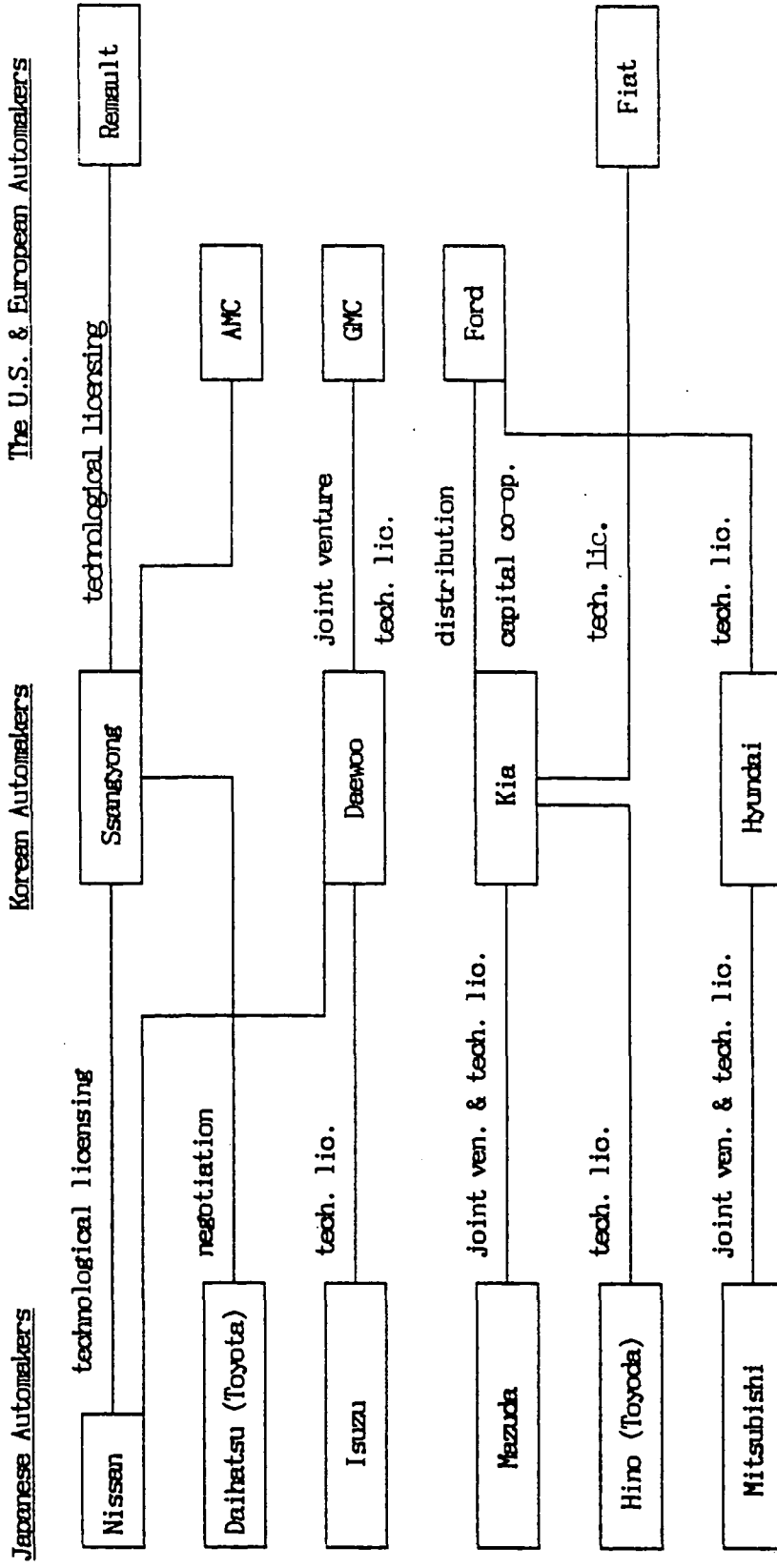
### III. International Involvement and Competitiveness of the Korean Car Industry

#### (1) Inflow of Technology and Capital

The major forms of international economic involvement in the Korean car industry beyond the traditional forms of commodity imports and exports are joint-ventures, technological licensing, joint production, subcontracting, and marketing arrangements. As shown in Table III-1, the Korean automakers are involved in various forms of business co-operation with more than ten automakers from the advanced countries. Almost all international economic involvement by the Korean automakers has been on the receiving end of the inward flows of either technologies or financial capital or both from their counterparts in the advanced countries, mainly the U.S.A. and Japan. Exceptions to this general pattern are the outward direct investment by Hyundai in an assembling plant (100,000 cars/year capacity) in Newmarket, Ontario, Canada and the recent acquisition of Panther Motor Co. of England by Ssangyong Group. It is expected that the Korean car industry will largely remain on the receiving end in the flow of design technology, financial capital, and overseas marketing know-how by 1990 or even beyond. Only after 1990, the managerial, technological and financial capability may reach somewhere near that of the advanced-country counterparts of today. It will be only then that the Korean automakers will be in a position to compete with their advanced-country counterparts in offering technological and managerial assistance to the later-comer automobile manufacturers in the developing countries of today.

Table III-1

International Involvement of the Korean Automakers



Sources : Jagongbo (Auto Industry Review ; in Korean), No. 55 (August, 1986), pp.21 - 22.

Japanese presence is predominant and widespread in technological licensing agreements offered to the Korean automakers and component suppliers. Nissan of Japan has made technology and joint-production arrangements with Ssangyong Motor Company (formerly Dong-A) for production of trucks, passenger vans and buses. Toyota has maintained close business ties, through its subsidiaries, Hino and Daihatsu, with Kia and Ssangyong for production of heavy-weight trucks. Isuzu is offering technological licensing agreements to Daewoo for production of trucks and buses. Mazda has maintained close ties with Kia in joint development and production of passenger cars and small-sized trucks. Mitsubishi has participated in a joint venture (10% share participation) plus licensing agreements with Hyundai and is also engaged in joint production of buses with Hyundai.

The American automakers are increasingly active in business involvement with Korean automakers in recent years. General Motor Company has been involved in a 50:50 joint business venture with Daewoo for production of a wide range of passenger cars, trucks and components. Ford Motor Company has made financial and marketing arrangements with Kia in overseas sales of passenger cars jointly developed by Kia and Mazda and offers technical licensing agreements to Hyundai for production of medium-sized passenger cars. Chrysler Motor Company has been in negotiation with Samsung Group for joint-production arrangements in complete lines of auto parts and components to be assembled at Chrysler plants in the U.S.

Renault, MAN, American Motor Company and Fiat are all involved in business ties of one kind or another with Korean component suppliers.

## (2) Export Marketing and Competitiveness of the Big Three Korean Automakers

Hyundai's dramatic success in exports of its subcompact cars to North America started with its record-breaking sales of PONY II in Canada. PONY II

which had been introduced to the Canadian market in 1983 became the bestselling imported car in Canada in 1985 and 1986, far surpassing the Japanese subcompacts like Honda, Toyota or Mazda.

Several factors account for such an unexpected success of the Korean subcompact cars in the Canadian auto market.

First, the export price of the Korean car was lower because of lower labor cost, but the exterior design and product quality were quite comparable to the more expensive imported subcompacts. Table III - 2 shows the breakdown of the unit price of PONY II (1.4 l engine) estimated on the basis of the 1985 costs. The manufacturer's unit price before excise taxes was about US\$ 3,910 (the 1985 price) of which labor costs occupied only 5 percent which could be made possible by low wage rate plus increasing automation of production process. According to a Japanese price comparison of the Japanese and the Korean subcompact cars in the Canadian market as of August, 1985, the basic model of PONY (1.4 l engine) was priced at C\$6,345, the comparable Toyota's basic model, TERCEL (1.5 l engine) at C\$6,959, Civic Honda (1.3 l) at C\$6,635, and Nissan's Centra at C\$8,075, respectively. Consumer's Association of Canada compared the consumers' response to the imported passenger cars as shown in Table III - 3.

Second, Canada's preferential (low) tariff rate applicable to Korean cars was definitely a favorable factor in price competition. The Korean cars were imported duty-free by the end of 1986 under Canada's preferential system applicable to manufactured imports from developing countries. The tariff rate of 6 percent that is scheduled to be imposed on the Korean cars imported to Canada after 1987 is still lower than that imposed on imported cars from developed countries.

Table III - 2      The Breakdown of the Manufacturing Cost of  
the Korean Car (PONY II) as of Jan. 1985

Costs	1,000 Won
Materials	2,568
Labor	163
Non-Labor Manufacturing Cost	226
Managerial & Sales Costs	78
Non-Business Expenses	71
Profit from Production	149
<hr/>	
Manufacture's Unit Cost before Taxes	3,256 (=US\$3,910)

Notes : U.S. \$100 = 827 won (Jan., 1985)

Source : Dong - A Ilbo (Daily), Jan. 5, 1985

Table III - 3      The Consumer's Response to the Imported Cars (%)

	<u>Very Satisfied</u>	<u>Moderately Satisfied</u>	<u>Unsatisfied</u>
N.American Cars	64.1	26.2	9.7
Japanese Cars	83.7	12.9	3.4
European Cars	67.7	21.2	11.2
Korean Cars	84.4	11.1	4.4

Source : Quoted from data released by Korea Automotive  
Industry Co-Operative Industry

Third, there was a gap (or shortage) in the supply of low-priced imported subcompact cars created by voluntary export restrictions on Japanese cars at the very time when Hyundai was exporting its PONY II subcompacts to Canada.

Fourth, a downward adjustment in the structure of interest rates was made in Canada from 1984 on, which made easier for consumers to purchase passenger cars.

The timing of Hyundai's entry into the Canadian market coincided with the interest-rate fall and the subsequent upswing of consumer demand for cars.

Fifth, Hyundai's announcement of its plan to establish its own assembly plant in Newmarket in Ontario created a good corporate image of Hyundai among Canadian consumers : Hyundai is responsible for what it has sold, and ready to service the cars it has sold with autoparts and components made in Canada.

Sixth, since most buyers of subcompact cars in Canada were first-time buyers, brandname loyalty was not yet working among them.

The Canadian market for imported subcompact cars turned out to be a valuable test market for Hyundai's subsequent entry into the U.S. market with PONY EXCELL and its variants like PRESTO. Encouraged by the unexpected sales of nearly 170,000 units of PONY EXCELL in the U.S. during the initial year (from August, 1985 to September, 1986), Hyundai targeted the sales of a quarter of million units of PONY EXCELL and its variants in the U.S. for its second year ending September, 1987. In fact, actual sales for the second year far exceeded the target sales by more than one hundred thousand units.

Several factors account for such a total success in the U.S. market for the Korean subcompact cars from the beginning years.

First, the export price of the front-wheel drive subcompact, EXCELL, was relatively low for its up-to-date design and product quality. This point was already made in the case of Hyundai's successful initial entry into the Canadian car

market.

Second, because of its successful sales performance in the Canadian market, the corporate image of Hyundai as a reputable small-car maker from Asia next to Japan was well established among the American consumers at the time of its entry into the U.S. market.

Third, in April, 1985, Hyundai Motor America, the U.S. sales headquarter of Hyundai, was created with its nation-wide network of exclusive dealerships. The well-performed and highly experienced independent dealers were selected for exclusive single dealership in large territory with sufficient profit incentives guaranteed through volume business.

Fourth, as a consequence of the voluntary export restrictions on Japanese cars, a gap in the supply of low-priced subcompact cars was also created in the U.S. car market, which Hyundai was to fill in with its PONY EXCELL.

Daewoo, a GMC joint venture company, started to export its own variant of the GMC world-car model, LEMANS, to the U.S. through GMC's Pontiac distribution network in mid-1987. LEMANS, an attractively designed and highly-performing subcompact car with many new engineering features is considered by many car experts to be one of best-selling imported cars in the U.S market. An explosive sales record of LEMANS in the Korean market, which is priced more than 15 percent higher than EXCELL, and a favourable reception in the U.S clearly illustrates this.

The company plans to sell 80,000 to 100,000 unit of LEMANS in the U.S.

through the Pontiac distribution channels during the initial year of 1987/88.

Kia, which had regained its vitality through successful sales of small trucks and van wagons in local market in the last five years, resumed production of passenger cars from the beginning of 1987 with the introduction of FESTIVA for the export market and PRIDE for the local market. Both FESTIVA and PRIDE are an identical, lower-priced smaller subcompact car similar to Honda Civic in exterior design and performance. The



consumer reception of PRIDE in the local market is quite favorable for the good corporate image of Kia, the low price and fuel economy of PRIDE and the low repair cost records of all the previous Kia-made vehicles. For 1987, Kia plans to sell about 40,000 units of FESTIVA in the U.S. market through the Ford distribution network.

With the planned exports of 410 thousand units of subcompact cars by the three Korean automakers to the U.S. for 1987, the U.S. market for subcompacts will be crowded with nearly one million cars mostly assembled overseas as indicated in Table III - 4. General Motor, Ford and Chrysler are all coming up with their own models of subcompacts assembled in the U.S., Japan, and England. Brazil, Yugoslavia, Malaysia and Thailand are also entering the U.S. auto market with low-priced subcompacts. The outcome of sales performance in the U.S. subcompact market for the year of 1987 and 1988 is particularly crucial to Kia and Daewoo, because the two companies as new entrants must secure a foothold in the U.S. market at the very time when the U.S. subcompact market is overcrowded. Furthermore, all the three Korean automakers find it critical to attain decent market shares in the U.S. as soon as possible in view of the likelihood that voluntary export restrictions of some kind similar to those currently imposed on Japanese car exports would be eventually imposed on their car exports to the U.S. market.

Table III - 4 The 1987 Prospective Sales of Small Cars under U.S. \$6,000

Company	Model	Base Price	Country of Production	Prospective Sales (unit)
G. M. C.	Sprint	5,995	Japan	60,000
G. M. C.	Chevett	4,990	England	—
Yugo	GV, CVX	3,995	Yugoslavia	70,000
Proton	Saga	4,890	Malaysia	—
Volkswagen	Volks	5,690	Brazil	50,000
Subaru	Justy	5,495	Japan	15,000
Ford	Festiva	5,765	Korea	40,000
Hyundai	Excell	5,195	Korea	250,000
Mitsubishi	Free Size	5,195	Korea	30,000
Honda	Civio	5,799	Japan	150,000
Toyoda	Terco LEZ	5,848	Japan	26,000
Chrysler	Colt	5,949	Japan	95,000
Chrysler	Omni America	5,799	U. S. A.	80,000
Daewoo	Lemans	5,999	Korea	100,000
Total				966,000

Source : Maeil Economic Daily, March 10, 1987.

Despite a very good sales record of the Korean subcompact cars in the Canadian and the U.S. markets in recent years, the Japanese car sales representatives in the U.S. are optimistic, according to a recent account in a Japanese business weekly, about the competitive advantages of the Japanese subcompacts over the Korean cars in the U.S.

They have pointed out two critical competitive edges in Japan's favor. First, the resale value of the Japanese cars is very high in Canada and the U.S. The resale value of a one and a half year old Japanese car in Canada is about 75-80 percent of the new car price, whereas that of the comparable Korean car would be

around 50 percent. The situation would be similar in the U.S. second-hand car market, according to the same source. Second, about 90 percent of the American buyers of the more expensive Japanese subcompact would be the upper and middle income families who have access to low-cost credit financing, whereas only 45 percent of those who purchase the inexpensive Korean cars would have the same kind of low-cost financing access. The remaining 55 percent of them would be sold to low-income families who, because of their low credit ratings, would have to pay higher interest costs for credit financing arranged by individual car dealers.\*)

These points precisely reveal the two crucial tests the Korean-made cars must pass in the U.S. auto market now and in near future. One is technical reliability plus physical durability, and the other is marketing expertise plus credit arrangement. The future success of the Korean cars in overseas markets will depend on how to pass these crucial tests.

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\*) Nikkei Business Weekly (in Japanese), PP.14 - 15, Dec. 8, 1986.

#### IV. Corporate Strategies and Industrial Relations

Much of what has been said in the previous section can be put together to disclose various aspects of the corporate strategies of the Korean car manufacturers. In this section, such scattered pieces of information will be brought together to see how the Korean car manufacturers have pursued their respective corporate strategies. It goes without saying that in formulating and pursuing their strategies, the car manufacturers must take into account their internal capabilities such as technology and financial capabilities, manpower resources, and marketing expertise, and the external environment including both local and overseas government regulations affecting the car industry, overseas and local market conditions, new trends in world-wide automotive technology, and so on.

##### 1) International Alliance Strategy

As pointed out in section III, all the three major car manufacturers have been allied with foreign partners in joint ventures, joint production, technological licensing agreements and overseas marketing arrangements with varying degrees of intensity. From its inception, Daewoo has been a 50:50 joint business venture company between GMC and the Korean partner. Mitsubishi of Japan recently took a minority share of 10 percent in the equity capital of Hyundai Motor Co., and Toyogogio of Japan (the maker of Mazda models) took also the 10 percent share of Kia's equity capital. These foreign partners have been deeply involved in joint product development and technological licensing agreements with Korean car manufacturers. LEMANS, a basic world-car model of new type was jointly developed by German and American GMC technical talents and Korean counterparts. FESTIVA (PRIDE is local brand name) was jointly developed by a Mazda and Kia team. Hyundai purchased licensing agreements

from Mitsubishi for design and know-how of engine blocks and other essential components of PONY EXCELL and its variants.

All the Korean car manufacturers are also involved in shared production of cars and/or components with their respective foreign partners. Dewoo and Kia are also exporting their passenger cars to the United States through their partners' distribution channels. In other words, they act as original equipment manufacturers (OEM) for GMC and Ford, respectively. It is Hyundai alone which has established its own overseas sales network through exclusive dealership arrangements in the U.S. and Canada.

The Korean car manufacturers' international alliance can be considered as the basic corporate strategy to overcome their weaknesses in advanced automotive technology, financial resources and marketing expertise and to take advantage of their low-cost labor and manufacturing capability in their attempt to expand car exports in uncertain and ever-changing overseas market environment.

## 2) Sourcing

One can note varying degrees of difference in sourcing policies among the Korean car manufactureres. Daewoo is procuring components and parts through over three hundred affiliated and independent suppliers not only for its own passenger cars but also for the overseas GMC component suppliers like Fisher and others. Hyundai tends to establish its own affiliates for production of engines and major components. Both Hyundai and Daewoo Motor Companies are integral parts of their respective business groups (conglomerates) comprising a number of establishments in diverse lines of business. They are able to directly produce a large portion of major components and materials within their own business group. Kia is a single business entity which has been long specialized in small trucks, micro-vans, and passenger cars. It naturally tends to rely for the supply of components and parts on a number of independent outside

suppliers.

Thus, one can note that the different size and business structure of the car manufacturers has led to different pattern of sourcing policies.

### 3) Product Mix

Though the three car manufacturers are producing passenger cars for both local and over seas markets, each of them has a different product mix. Hyundai, for instance, has remained a single most important manufacturer of small cars in Korea since the early 1970's, although the company has recently diversified into production of heavy trucks and large-sized buses. Kia's main line of business is still production of small-sized trucks and vans mainly for local market. The company resumed small car production only in the beginning of 1987. Daewoo has been long specialized in compact and medium-sized GMC cars and heavy-duty GMC trucks mainly for local market. The company started production of export-oriented subcompacts, LEMANS, in late 1986.

### 4) R & D Strategy

As indicated in previous sections, all three car manufacturers have been relying on foreign partners for advanced automotive technology. One can, however, note a trace of different intensity in indigenous R&D efforts among the three manufacturers.

Daewoo's R&D efforts are largely tied with the global strategy of the GMC world-car development because of its affiliation with GMC. Because of its relatively weak financial structure and long affiliation with Mazda, Kia has been relying on Mazda for developing a new subcompact model like FESTIVA (PRIDE) and improving the existing models of medium-sized passenger cars, vans and small trucks initially developed and marketed in Japan by Mazda.

Hyundai is much more active than its local competitors in endogenous R&D efforts to develop its own models. The technological licensing arrangements it has made with foreign partners are confined to selected areas of specific design technology for production of passenger cars and components.

Such a difference in technology strategy among the car manufacturers reflects, in large measure, a difference in the extent of foreign share participation, financial resources, and organizational size and structure of these companies.

#### 5) Management-Labor Relations

From its inception in 1962 to the second half of 1987 when the ever-intensifying student and civilian protest movement against the repressive government of Generals Park and Chun culminated in the restoration of political freedom, the Korean car industry enjoyed the advantage of relatively strike-free tranquility in management-labor relations. For the period from 1962 to 1972, the year when President Park staged a political coup through constitutional amendments for his life-time unlimited political power, the labor market for industrial workers in South Korea could be largely characterized by labor surplus conditions. Workers were competing to find employment in automotive assembly plants because the scale of wages and fringe benefits paid by the Korean car manufacturers were considered to exceed far above the average wage level of manufacturing sector as a whole. The Korean labor laws prevailing before 1972 which had been modeled after the Western European labor laws were considered to be too "liberal" to be practical in the Korean reality. Both management and labor sides did not bother too much with the legal aspects of labor disputes, most of which were then related to defaults or back-wage payments due to business failures by small and medium enterprises. Labor unions were neither organized nor recognized in many industrial enterprises. Labor unions formally organized in large enterprises were

either nominal or accused of becoming "friendly" to management sides.

As the labor market was becoming gradually tight from the mid-1970's, the frequency of labor disputes was increasing. The government soon came to intervene in labor disputes mostly in favor of the management side in the name of maintaining "law and order" and "national security." Labor strikes and any other forms of collective resistance were prohibited under a new series of emergency labor laws from the mid-1970's through mid-1987. During this period of authoritarian rule by the military leaders, only a small number of labor disputes surfaced in the Korean car industry. Any incidents of strikes and collective protests were instantly crushed by police force with or without the management consent. Under these circumstances, the task of maintaining industrial peace fell into the hand of the government as integral part of maintaining "national security." While labor unions' bargaining power was weak in wage negotiations and disputes in the car industry, the average level of wages and other compensations and working conditions at assembly plants were largely considered to be better than those in other manufacturing industries. Furthermore, it is noteworthy that very few regular employees were fired or laid off in both Hyundai and Daewoo. Work force reduction at assembly plants during business recessions was carried out in the forms of attrition and intra-group transfer of workers in the cases of Hyundai and Daewoo Groups. Kia which was a single business entity specializing in automotive production suffered from mounting debt, subsequent bankruptcy, and the resulting inability to pay back-wages to its workers, which led to the protracted labor-management disputes during the recession of 1980 and 82. The bankruptcy and labor disputes were finally resolved when 90 percent of the ownership shares of the company were transferred to its employees together with the management takeover by representatives of employees under the bank guarantee of loan payment rescheduling and additional loans.

Political upheaval and democratic reform movement during the second half of 1987



marked a new decisive turning point in labor-management relations in South Korea . New labor unions have been organized from grassroots under militant and radical leadership which replaced the existing unions and their moderate leadership for all practical purposes. Hundreds of labor strikes and collective protests were staged in large and medium enterprises across almost all industries. Labor unions in the car industry succeeded in an increase of 15-20 percent in wages and benefits in the fall of 1987. Another round of labor-management negotiations and disputes for wage increase and improvement of working conditions began in the spring of 1988. Labor strikes are taking place at all the four auto assembly plants of Daewoo as of mid-April, 1988. The union is demanding a 26 percent wage hike while the management is offering a 17 percent increase. In the meantime, the company is losing six hundred units of Lemans due to the current strike, precisely at the moment when the demand for Lemans in the U.S. and Korean markets is greater than ever. Following Daewoo, Hyundai is likely to face labor strikes in its auto assembly and component manufacturing plants. Kia which has long enjoyed strike-free management-labor relations will have to eventually make upward adjustments in wages and compensations in line with new wage scales settled by Hyundai and Daewoo.

Money wage level of assembly workers in the Korean car industry was increased by 15-20 percent in the fall of 1987 and is likely to increase by 18 - 20 percent again in the spring of 1988. Some industry experts tend to view such two consecutive wage increases within the last eighth months as lump-sum upward adjustment of the real income of industrial workers which had been long suppressed by the repressive government. Pressure for wage increases in the car industry in the foreseeable future, according to industry experts, is likely to be moderate in view of several economic forces working in Korea's industrial labor market : (a) increasing annual inflow of new participants (highschool and college graduates) in labor market, (b) shift of labor force from low-wage to high-wage industries through rapid industrial

restructuring, due to accelerated revaluation of local currency and real wage increase, and (3) wide spread acceleration of automation and mechanization of assembly plants by car manufacturers and component suppliers.

## V. Factors in International Expansion of the Korean Car Industry

Several factors operating both on the supply and the demand sides account for the transformation of the Korean car industry into an export-oriented industry since 1983.

### 1) Supply-Side Factors

#### (a) The Low Labor Cost of Production

Since the basic elements of automotive technology has been known for more than a century, and since the low-priced small car has become a standardized (mature) product, it is the comparative advantage of low factor (particularly labor) cost of production which is a key determinant in international shift in location of automobil productive capacity, as expounded by Professor Vernon and his followers over a quarter century ago. The comparative advantage in the low-cost production of subcompact cars has been shifting from Western Europe in 1960's to Japan in the 1970's, and to the NICs, including Brazil and South Korea in the 1980's. In the case of Korea, the low-wage cost of well-educated and semi-skilled labor is the single most important factor in maintaining the country's competitive edge in small car production.

As shown in Table V-1, the labor cost of the Korean car industry was estimated to be 11 percent of its U.S. counterpart, 61 percent of its West German counterpart, and 27 percent of its Japanese counterpart, respectively. It was still one half of its Brazilian (24 percent) and Mexican (22 percent) competitors. These figures are somewhat outdated, but the fact that the Korean car industry has a comparative advantage in labor cost still holds true in the case of the Korean car industry despite sharp upward wage adjustments of 30 - 40% in the last eight months.

V-1 International Comparison of Automobile Production Costs.

	Wage Rate Per Hour (U.S. dollar) 1)	Productivity 2)	Relative Labor Cost 3)
U. S. A.	19.37	1.00	1.00
W. Germany	12.89	1.10	0.61
Japan	7.24	1.40	0.27
Mexico	3.53	0.85	0.22
Brazil	3.66	0.80	0.24
Korea	1.95	0.90	0.11

Source : Jagongbo No. 57 (Oct. 1986),  
Korea Automotive Industry Co-operative Association

- Notes : 1) The 1982 U.S. dollar value based on the U.S. Dept of Labor estimates  
 2) The Economist Intelligence Unit (London) estimates  
 3) Relative labor cost =  $\frac{\text{hourly wage} \times (1 / \text{productivity})}{\text{U.S. hourly wage (U.S.\$19.37)}}$

V - 2 Composite Manufacturing Cost Statement  
(three main automakers)

	Composition Ratio (%)							Value (million)
	1980	1981	1982	1983	1984	1985	1986	
Current Gross Manufacturing Cost	100.0	100.0	100.0	100.0	100.0	100.0	100.0	2,900
Materials & Parts	82.4	82.6	82.9	81.6	85.4	85.7	90.1	2,620
Labor Cost	8.6	8.3	7.7	9.1	7.3	7.1	4.8	130
Basic Pay	8.1	7.5	6.4	6.0	5.2	5.9	2.9	80
Allowances		0.8	1.4	3.0	2.2	1.1	1.8	50
Other Expenses	9.0	9.1	9.4	9.4	7.2	7.3	5.1	140
Inventory Adjustments	9.1	9.3	7.1	5.4	4.2	2.7	2.5	70
Other Adjustments	6.5	2.2	5.5	4.7	4.5	10.7	6.9	200
Current Net Mfg Cost	91.8	97.3	94.9	95.1	94.4	89.4	92.6	2,690

Sources : Bank of Korea : Annual Report of Enterprise Management Analysis (1979 - 87)

According to the composite manufacturing cost statement of the three automakers estimated by the Bank of Korea, the average share of labor cost in total manufacturing cost has shown a downward trend from the peak of 9.1 percent in 1983 to 7.1 percent in 1985 and down to 4.8 percent in 1986, as shown in Table V-2. Table V-3 shows that the share of labor cost in value added of the auto makers has remained slightly below 50 percent from 1982 on. A detailed breakdown of wages according to skill classification is not available from the auto manufacturers. From Table V-4, one can read annual wage and salary bills per employee of the auto industry over time. Real wages per employee as expressed in the 1980 constant U.S. dollars increased from U.S.\$3,787 in 1981, to U.S.\$5,619 in 1982, to U.S. \$6,811 in 1983, to U.S.\$7,420 in 1984 and to U.S.\$7,667 in 1985. It fell, however, sharply to U.S.\$6,417 in 1986. Reasons for such a sharp drop in real wage for employee are not clear, but one can suspect that a sharp increase in the number of newly hired low-wage workers to meet increasing export demand may partly account for such a drop in real wage level. Taking into account an increase of 30 percent to 40 percent in nominal wage rates of auto industrial workers during the recent labor-management disputes, the real wage level in 1988 will exceed the 1985 level, but not very much.

An immediate and most conspicuous factor working in favor of the relative cost position of the Korean auto industry was the dramatic upward revaluation of the Japanese yen, which made Korean cars comparatively cheaper. But such a temporary advantage is rapidly eroding as the upward revaluation of the Korean won has been, and will be, very much accelerating throughout 1988.

V - 3 Structure of Gross Value Added  
(three main automakers)

Unit : %

	1978	1988	1980	1981	1982	1983	1984	1985	1986
Profits before Corporate Tax	29.4	21.1	-87.6	-61.2	-2.4	20.4	22.5	19.7	21.7
Labor Cost	49.4	50.8	78.8	61.2	49.9	45.1	45.1	48.0	49.6
Financial Costs	16.0	13.8	75.9	72.8	35.9	17.7	17.7	13.5	10.9
Rents	0.8	0.7	1.5	1.2	1.3	1.8	1.8	1.3	2.4
Taxes and Fees	1.8	1.9	2.8	2.2	1.6	1.4	1.4	1.3	1.4
Depreciation Allowances	8.6	11.8	28.7	23.8	19.9	13.6	11.5	16.2	14.1

Sources : Bank of Korea, Annual Report of Enterprise Management Analysis (1979-87)

IV - 4 Value Added, Sales, and Labor Cost (the 1980 constant U.S. dollars)  
(three main automakers)

Unit : \$

	1978	1979	1980	1981	1982	1983	1984	1985	1986
Sales (per worker)	54038.5	49292.4	38833.2	38577.9	59110.0	62106.8	67781.7	71603.8	94533.5
Value Added (per worker)	8880.9	9690.8	5295.2	6188.8	12805.3	14823.8	16448.3	15979.5	12947.1
Wages & Compensation (Per worker)	3857.6	5019.7	4173.5	3787.0	5619.8	6811.1	7420.9	7667.1	6417.4

Sources : Bank of Korea : Annual Report of Enterprise Management Analysis (1978-1987)

(b) Economies of Scale and Learning Effects

As indicated in Table II - 3, the productive capacity of the Korean auto industry has been rapidly expanding since 1983 when the exports of passenger cars started to grow sharply. During 1987, Hyundai expanded its productive capacity to the level of 700,000 cars/year, Daewoo to 330,000 cars/year, and Kia to 150,000 cars/year. If a minimum efficient level for realizing economies of scale for a single car model is assumed to be 500,000 cars/year, it is still Hyundai alone which has reached that level. This may be one of main reasons why Hyundai has been directly exporting its passenger cars with its own brand name through its own distribution network in the North America. Daewoo and Kia are indirectly exporting their passenger cars as original equipment manufacturers (OEM) through General Motors and Ford, respectively. As frequently pointed out by economists, a small country (like South Korea) with limited local market for passenger cars and insufficient stock of technological know-how can best specialize in low-cost, standardized (undifferentiated) small cars for both export and local markets to attain international competitiveness through economies of scale. This is precisely the pattern of international expansion that the Korean auto industry has so far followed in last several years.

The falling average cost of passenger cars results from falling fixed cost through indivisibility of plants and equipment and from productivity growth through specialization of labor and equipment. But such economies of scale are meaningful only under static conditions. Under dynamic conditions, technology level, factor costs, material prices, and external economic circumstances are subject to changes. Of these factors, the effect of learning by doing (i.e. X-efficiency) and the effort to narrow the gap between the best and the average levels of technology in assembling lines and in production of automotive parts and components are important sources of productivity growth in the Korean car industry during the last five years of export expansion.

(c) Growth of the Related Industries

Small passenger cars are assembled with more than 20,000 completely-knocked-down (CKD) parts and about 2,500 materials. Naturally, the car industry is closely linked for the supply of these parts and materials with iron and steel, metal fabrication, machinery, rubber, chemicals, textile, glass, electronics, and other industries. The technical level and productivity of the car industry is crucially dependent on the scale and technical level of these related industries of backward linkage type. Furthermore, plastic industry is increasingly important in connection with the industry's efforts to reduce the weight of cars. Computer industry is also closely linked with the car industry since computer system and electronic devices are increasingly incorporated into production of passenger cars. Thus, the extent and intensity of interrelatedness of the car industry with other industries continues to increase.

Although a predominant portion (about 87 percent in value) of parts and materials for production of small passenger cars are locally supplied, the Korean car industry is lagging far behind its advanced-country counterparts in development of new basic materials and alternative engine blocks. But the prospect for incorporating electronic devices and computer system into cars and into process of car production is somewhat promising. Electronic fuel injection system, electronically-controlled transmission, suspension and power steering systems, and other safety and convenience devices are expected to be locally produced with indigenous technology by 1990 or the early 1990's.

(2) Demand-Side Factors

(a) Similarity in Structure of Demand for Small Cars between Local and Overseas Markets

A predominant majority of passenger cars in great demand by most Korean consumers



are falling into the category of "subcompact" cars, the demand for which has been also steadily growing in the U.S. market. U.S. consumer demand for subcompact cars, both locally produced and imported, was projected to reach more than 2.5 million units, or roughly 25 percent of total U.S. demand for passenger cars in 1987. Many factors account for the U.S. consumer preference for imported subcompacts: low import price, fuel economy (between 25 and 44 MPG), increase in car-purchasing population of ages between 25 and 44, increased participation in labor force by women, smaller size of household, firm establishment of a subcompact as a second car, etc. Furthermore, as the import price of Japanese subcompact cars has risen sharply due to "voluntary" export restrictions and subsequent appreciation of the Japanese currency, a gap between supply of and demand for low-cost subcompacts had been created which was soon to be filled by Korea-exported subcompacts. In short, the Korean small cars have met the basic conditions of the U.S. market demand for subcompacts: low-priced undifferentiated, practical cars especially suited to (a) the taste and budgets of the low-income American consumers, including the young and working women who are purchasing their own cars for the first time and (b) to the need of large middle-income families who are looking for inexpensive second cars.

(b) Increase in Local Demand

While it is true that rapid growth of Korea's car production has been almost entirely associated with rapid growth of car exports, local demand for passenger cars has also started to rise as the Korean economy has been continuously growing and as new models of passenger cars are introduced in local markets. As of the end of 1986, the share of exports in total production of passenger cars reached 65.6 percent. There is, however, sufficient room for increase in domestic demand for passenger cars, considering the rising per capita income level and low ratio of car owners to Korean population. The number of car owners per 1,000 persons was 13.6 in Korea (in 1985), 227.3 in Japan (1984), 416.7 in West Germany (1984), 434.8 in Canada (1984), and 555.6

in the U.S. (1984). The Korean figure is far below those of Mexico (63.3 persons) and Brazil (64.1 persons).

Up to the present moment, several factors have discouraged the growth of local demand for passenger cars. First, the high rates of taxes and fees (including special consumption taxes, national defense tax, value-added tax, registration fees, licensing fees, government bond purchases etc.) imposed on the local purchase and operation of passenger cars. In addition, the high local price of gasoline which reflects high consumption tax has dampened potential demand for passenger cars. As shown in Table V-5, the ratio of taxes and fees imposed at the time of purchase to the factory price of passenger car is 46.5 percent, and the ratio of annual taxes and fees for car operations to the factory price of passenger cars is 13.9 percent. These ratios are nearly twice as high as those of other countries.

Second, the relatively small size of the national land, excessive urban concentration of population, and deficient road system in Korea are constraints to growth of local demand for passenger cars.

Rising per capita income of the Korean consumers and high income elasticity of demand for passenger cars will eventually usher in a phase of "mass motorization", once institutional constraints such as tax system and physical constraints such as deficient expressway system and parking facilities are removed.

Table V-5                      International Comparison of Automobile Taxes and Fees

	<u>Korea</u>	<u>Japan</u>	<u>England</u>	<u>W.Germany</u>
at the time of purchase	46.5%	24.4%	26.5%	14.0%
annual operations	13.9%	12.7%	6.7%	7.0%

Sources : Hyundai Motor Company (1986)

Notes : Percentage figure =  $\frac{\text{total amount of taxes and fees}}{\text{factory price of car}} \times 100\%$

Korean cars : the class of 1,500 cc engines  
 Foreign cars : the class of 1,600 cc engines

## VI. Problems Ahead

The rapid transformation of the Korean car industry into an export-oriented industry in the last five years has posed a host of problems at present and for foreseeable future.

### (a) Danger of Overcapacity

Korean car manufactures have expanded, and are still expanding, their productive capacity somewhat beyond a limit considered feasible. As pointed out in Section II, the total demand for Korean passenger cars for 1990 was projected to reach around 1.3 million units, whereas the sum total of assembly plant capacities planned by the Korean manufacturers is around 2 million units, thus showing an excess capacity of 700,000 units for the car industry as a whole. Such an excessive expansion of productive capacity can be accounted for by (1) an optimism based on unusually strong export demand and growing domestic demand in recent years and by (2) a calculated risks taken by the Korean car makers to attain economies of scale in production and decent shares of the U.S. subcompact market before the U.S. government imposes import quota in the form of Japanese-style "voluntary restrictions" on Korean-exported cars.

In view of the limited capacity of local car market to absorb the expanded supply potentials, a predominant proportion of passenger cars has to be exported, thus raising the export dependence of the Korean car industry to a dangerously high level. Such a high degree of export dependence will weaken the industry's ability to make adjustment to changes in export demand, causing cyclical and chronic instability associated with under-utilization of productive capacity and unemployment.

To deal with the problem of overcapacity, one can think of several lines of attack.

First, a voluntary consultative body must be formed among the Korean automakers to avoid overlapping investments in plants and equipment. A recent move among the Korean

automakers toward shared production of auto parts in common use is a case in point.

Second, the industry must strengthen the capacity to collect and up-to-date information on world-wide demand for and supply of passenger cars in order to strengthen the base for flexible adjustment in productive capacity to changing overseas market conditions.

Third, domestic demand for passenger cars must be encouraged through tax reforms and improvement of road system and parking facilities.

#### (b) Backwardness of Component Suppliers

Technical backwardness and financial weakness of automotive component suppliers can be considered as a serious threat to the growth and qualitative improvement of the Korean car industry. Several factors account for such an imbalance in supply capacity and technical level between suppliers and car manufactures. First, an excessively large number of financially-weak small suppliers facing insufficient market demand cannot possibly attain economies of scale in production. Second, division of labor and specialization is not well developed among suppliers and between suppliers and auto makers. Furthermore, as a number of large enterprises have come to newly participate in production and export of automotive parts and components, they have made overlapping and duplicative investments in plants and equipment in the over-crowded component industry. Small suppliers have, thus, suffered from excessive competition and idle capacity. Third, the quality of automotive parts produced in Korea is not yet good enough for the use of overseas original equipment manufacturers. Most of Korean - made parts and components are exported for the use of repair services. The Korean automakers are partly equipping their export cars with imported foreign parts to ensure their quality. Fourth, Korean suppliers have not made sufficient investment for technical improvement. The levels of designing, heat treatment, and coating technologies are far below international standards. Financial constraints, excessive price competition, scarcity of technical manpower, and weak local

base of science and technology are responsible for low R&D investment activities among part suppliers. Instead of making indigenous R&D efforts, they have opted an easy way-out : technical licensing agreements with foreign counterparts and occasional technical assistance from local automakers. Fifth, basic materials for automotive parts, such as steel, aluminum, plastics, rubber, and asbetos, are locally available, but high-priced and of low-quality. About 20 percent of basic materials required for production of automotive parts are imported, but their prices are rather high due to high import duties.

To deal with these problems, the following measures can be considered.

First, technical assistance from affiliated automakers and from professional research institutes should be strengthened.

Second, each supplier should be made to specialize in a small number of specific automotive parts and be permitted to supply their specialized parts to all automakers so that the supplier may attain economies of scale and quality improvement. In other words, a new system of horizontal specialization among suppliers and between suppliers and automakers should be developed.

Third, indigeous R&D expenditures, technical licensing arrangements and joint ventures with foreign partners should be combined to help develop essential basic materials needed for production of automotive parts.

### 3) Technical Constraints

As pointed out in Section II, the Korean car industry is far behind its advanced country counterparts in design technology and production automation. The industry is largely relying on imported foreign design technology. The extent of automation in production process at car assembly lines in Korea is in the range of 20 percent to 40 percent, depending on specific areas of operations. The corresponding figures in the

advanced countries is between 70 percent and 80 percent. Since the advanced-country car manufacturers are reluctant to transfer advanced technologies in design and other vital areas to developing-country counterparts, the technological gap between the advanced countries and Korea is widened rather than narrowed. Such a trend is expected to continue for foreseeable future.

To meet these basic challenges, the following measures are recommended :

First, indigenous R&D investment activities should be expanded.

Second, research manpower should be secured to meet indigenous R&D needs. As of the end of 1985, there were nine research institutes established by three automakers and six suppliers, and 2,200 research workers employed in these institutes. The number of research institutes and research manpower is likely to increase rapidly in near future.

Third, efforts should be made to increase inflow of advanced automotive technologies along with local R&D efforts. In view of the advanced-country auto makers' reluctance to make the state-of-art automotive technologies available to their developing-country counterparts, the forms of technological transfer should be diversified including joint ventures, subcontracting, and shared production, in addition to technological licensing.

#### 4) Danger of Import Restrictions

Korea's exports of passenger cars have been concentrated into the U.S. and Canada. Such regional concentration of ever-increasing car exports is likely to bring about non-tariff restrictions on the import of Korean-made cars by the governments of importing countries. The following measures can be taken to reduce the risk of non-tariff import restrictions :

First, overseas direct investment by Korean automakers should be encouraged in

those countries where Korea's car exports are concentrated. In addition to the advantages of overcoming import restrictions on assembled cars, overseas direct investment in the advanced countries would not only enable Korean automakers to get nearer to the markets where their products are sold, but also to gain access to advanced automobile technologies and engineering know-how available in these countries.

Second, in the long run, the present pattern of quantitative expansion of low-priced subcompact exports will have to be replaced by diversified exports of high-quality compact and medium-sized cars.

Third, since the opening of new export markets for passenger cars and the establishment of sales and after-service network overseas are considered to be a formidable task for medium-sized Korean automakers, joint operations in production and marketing with foreign partners would be best suited.

#### 5) Risks from Changing Overseas Demand and Capital Requirement

Business risks associated with uncertainty in automobile demand overseas are great in view of the long time period required for development of a new model and huge capital cost incurred due to indivisibility of plants and equipment for automobile production. Uncertainty on demand side and cost requirements on supply side may be too great for an average Korean automaker to assume all by himself.

Korean carmakers' active participation in technological licensing agreements, joint ventures, marketing arrangements and financial and production sharing with foreign automakers in recent years can be in part considered as an effort to reduce such great business risks associated with demand uncertainty and huge cost requirements. Kia's entry into the U.S. car market under the Ford's brand-name of FESTIVA through Ford's distribution network is a case in point where low production cost of the Korean automakers and Japanese Technology (Mazda) are combined with marketing network and

financial power of Ford. Daewoo's entry into the U.S. car market under the GMC brand-name of LEMANS is also the same case in point where Daewoo's low production cost is combined with the German GMC's world-car technology and the U.S. GMC's marketing network.



APPENDIX

Table A-1 Output Performance of Korea's Motor Vehicle Industry

(unit : number of cars)

	Passenger Car			Bus			Truck			Total Output
	Output	Local	Export	Output	Local	Export	Output	Local	Export	
1962	1,710						67			1,777
1966	3,117			236			313			3,430
1967	4,983			236			1,385			6,604
1968	11,630			942			5,085			17,657
1969	19,494			1,882			9,618			30,994
1970	14,487			3,803			10,529			28,819
1971	13,345	11,383		3,063	2,651		7,511	7,475		23,919
1972	10,233	9,103		2,581	2,507		6,542	6,382		19,357
1973	12,891	13,136		3,494	3,435		10,069	9,385		26,454
1974	9,311	11,337		3,947	3,946		19,179	18,414		32,517
1975	18,509	17,713		3,808	3,697		14,973	13,604	31	37,230
1976	25,605	25,011	558	3,468	3,342	36	19,219	19,180	647	48,292
1977	42,284	36,551	5,075	5,453	5,580	6	25,263	55,347	4,055	73,000
1978	85,693	71,972	16,371	7,279	7,149	67	63,446	156,418	9,858	156,418
1979	112,314	89,080	18,702	12,307	11,640	75	76,601	65,006	12,633	201,222
1980	55,926			11,525			51,660			119,111
1981	66,602		16,177	13,358		395	47,918		8,492	127,878
1982	93,451		14,067	20,931		215	43,705		5,511	158,087
1983	120,557	103,434	16,340	25,595	25,733	192	66,095	57,118	7,952	212,246
1984	156,986	105,770	48,630	26,554	25,897	561	73,042	70,075	2,967	256,582
1985	262,775	134,509	119,099	29,090	28,152	745	78,171	75,749	2,960	370,036
1986	455,285	112,257*	238,702	36,386	27,102	605	99,129	67,275	6,699	590,000

Sources : Korea Automotive Industry Co-operative Association, Hyundai Motor Company  
 Note 1) : Local use for 1986 covers data for Jan. - Sept., 1986.

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