The Development of Producer-Driven Commodity Chains in the Automobile Industry in Korea: Relations to Japan and the United States*

EUN MEE KIM

Graduate School of International Studies, Ewha Womans University

This paper analyzes South Korea's automobile industry and demonstrates how a semi-periphery can successfully develop an automobile industry without its own basis of advanced technology or large accumulation of capital. By utilizing the global commodity chains perspective with an emphasis on its governance structure, the PDCC (the producer-driven commodity chains), the paper identifies several key features which distinguish the South Korean automobile industry from its counterparts in other developing nations. South Korea has a thriving automobile industry. In 1999 it was the world's seventh largest producer of automobiles with more than 2.8 million units, the sixth largest exporter of automobiles with more than 1.5 million units, and the fourth largest producer of automobile components. Moreover, South Korea's automobile industry experienced an astonishingly rapid growth rate with an annual average growth rate of 26.7 percent between 1962-98. South Korea's automobile industry is also noteworthy in that it has built its own technology and models, when only about ten countries in the world have indigenous technology and models. The South Korean automobile industry combines both core and semi-peripheral characteristics, challenging several assumptions about a PDCC from the World System perspective and the commodity chains perspective. It demonstrates, foremost, that an automobile industry can thrive in a semi-periphery. Second, South Korea's automobile industry is focused not only on the manufacture of parts and supplies, but on a full-fledged assembly of finished automobiles, which is difficult to find in a semi-periphery. Third, due to the relatively small domestic market, South Korea's automobile industry has engaged in exports to gain necessary economies of scale. Fourth, South Korean automobile exports have been based more on price competitiveness than on technological advances, although this pattern has begun to change recently. Price competitiveness is usually found as a comparative advantage for a semi-periphery in less capital- and technology-intensive light manufactured industries, in a buyer-driven commodity chain (BIDCC). In other words, the South Korean automobile industry does not show the typical characteristics of a PDCC. Finally, large domestic corporations rather than transnational corporations (TNCs) have dominated the South Korean automobile industry, and developed indigenous technology and models.

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Direct all correspondence to Eun Mee Kim, Professor of Graduate School of International Studies, Ewha Womans University, 11-1 Daehyun-dong, Seodaemun-gu, Seoul, 120-750, Korea; Phone 82-2-3277-3669; fax 82-2-365-0943; e-mail: emkim@mm.ewha.ac.kr

1. INTRODUCTION

The automobile industry is regarded as a vital industry for a nation's economic development and industrial upgrading, since it provides numerous significant backward and forward linkages. However, it is not an industry found in all nations. According to the World System perspective, the automobile industry is an industry exclusive to core nations due to its capital- and technology-intensive nature. As a prime example of a producer-driven commodity chain (PDCC), it derives profits based on "scale, volume, and technological advances," where the transnational corporations (TNCs) play a pivotal role (Gereffi 1994, 99).

However, South Korea, a semi-periphery nation, has a thriving automobile industry. In 1999 it was the world's seventh largest producer of automobiles with more than 2.8 million units, the sixth largest exporter of automobiles with more than 1.5 million units, and the fourth largest producer of automobile components (Biggart and Guillen 1999; Korea Automobile Manufacturers Association 2000).¹ Moreover, South Korea's automobile industry experienced an astonishingly rapid growth rate with an annual average growth rate of 26.7 percent between 1962-98 (Korea Automobile Manufacturers Association 1999). South Korea's automobile industry is also noteworthy in that it has built its own technology and models, when only about ten countries in the world have indigenous technology and models.

The South Korean automobile industry combines both core and semi-peripheral characteristics, challenging several assumptions about a PDCC from the World System perspective and the commodity chains perspective. It demonstrates, foremost, that an automobile industry can thrive in a semi-periphery. Second, South Korea's automobile industry is focused not only on the manufacture of parts and supplies, but on a full-fledged assembly of finished automobiles, which is difficult to find in a semi-periphery. Third, due to the relatively small domestic market, South Korea's automobile industry has engaged in exports to gain necessary economies of scale. Fourth, South Korean automobile exports have been based more on price competitiveness than on technological advances, although this pattern has begun to change recently. Price competitiveness is usually found as a comparative advantage for a semi-periphery in less capital- and technology-intensive light manufactured industries, in a buyer-driven commodity chain (BDCC). In other words, the South Korean automobile industry does not show the typical characteristics of a PDCC. Finally, large domestic corporations rather than transnational corporations (TNCs) have dominated the South Korean automobile industry, and developed indigenous technology and models.

The paper's goal is to demonstrate, by analyzing South Korea's automobile industry, how a semi-periphery can successfully develop an automobile industry without its own basis of advanced technology or large accumulation of capital. The paper will utilize

¹ In 1997, which was before the Asian financial crisis, South Korea's automobile industry was more robust. In 1997, South Korea was the fourth largest in automobile production, and the sixth largest in automobile exports, in the world (Ministry of Commerce, Industry and Energy 1999). See Appendix 1 for details.

the global commodity chains perspective with an emphasis on its governance structure, the PDCC. The paper is organized into three major parts. Section II provides a brief overview of the PDCC analysis of the automobile industry as a framework for analysis of the South Korean case. Section III presents an overview of the South Korean automobile industry's development. Indigenous research and development efforts, as well as government policies are examined in order to shed light on how South Korea's automobile industry developed its own technology and models. Section IV focuses on the South Korean automobile industry in the global network of production and sales. The conclusion analyzes key features of the South Korean automobile industry, which distinguish it from those found in core nations, and in particular, from a PDCC.

II. AUTOMOBILE INDUSTRY: THE PRODUCER-DRIVEN COMMODITY CHAIN

The global commodity chain perspective, which traces the globalized production and sale of a commodity, is very useful in analyzing an industry such as automobiles. Industries are increasingly coordinated at the global level, where acquisition of raw material, production of parts, assembly of final products, marketing, and sales often occur in different geographical nodes. Such compartmentalized production and sales require a high level of administrative coordination by diverse corporate actors (Gereffi 1994, 1996; Rabach and Kim 1994). Key factors of this globalized production system are that the large firms simultaneously participate in many different countries, and their activities are coordinated "not in an isolated or segmented fashion but as part of their global production and distribution strategies" (Gereffi 1994, 96). According to Gereffi, global commodity chains have three main dimensions, which are as follows:

- (1) an input-output structure (i.e., a set of products and services linked together in a sequence of value-adding economic activities);
- (2) a territoriality (i.e., spatial dispersion or concentration of production and distribution networks, comprised of enterprises of different sizes and types); and
- (3) a governance structure (i.e., authority and power relationships that determine how financial, material, and human resources are allocated and flow within a chain) (Gereffi 1994, 96-97).

Research using the global commodity chain has identified two distinct types of governance structures, "producer-driven" and "buyer-driven" commodity chains. A key difference between the two is that the former commodity chain is coordinated and controlled by large-scale producers of capital- and technology-intensive commodities, while the latter is coordinated and dominated by "large retailers, brand-named merchandizers, and trading companies" (Gereffi 1994, 97). In the latter, production networks are typically scattered throughout the Third World, where labor-intensive industries prevail to take advantage of cheap labor costs.

PDCCs are found in capital- and technology-intensive industries such as automobiles, computers, aircraft, and electrical machinery. In this governance structure, production is controlled by "large integrated industrial enterprises" or TNCs (Gereffi 1994, 97). For example, the production of automobiles in the United States is controlled and coordinated by the Big Three automakers (General Motors, Ford, and Chrysler Corporation). These large automobile TNCs coordinate everything from production design, and research and development (R & D), to product innovation and marketing.

This structure differs from BDCCs, whose production is coordinated by large-scale "buyers." For example, garments, footwear, toys, and consumer electronics are produced in various Third World countries under original equipment manufacturer (OEM) arrangements. Here, product design and product innovation are not carried out by the producers as in the PDCCs, but by the key buyers; hence, the name BDCCs.

The automobile industry is a prime example of a PDCC. Due to its capital- and technology-intensive nature, the industry is often found in core nations. If it is found at all in the semi-peripheral nations, it takes the form of lower-end and labor-intensive parts production or assembly, rather than the production of a finished product (Biggart and Guillen 1999).² Automobile production requires numerous parts, from low-tech and labor-intensive parts such as seats and mirrors to high-tech and capital-intensive computerized equipment and engines. Thus, the production of various components of the automobile can be dispersed in countries with different positions in the international division of labor, from semi-periphery to core economies. As shown in Table 1, automobile producers in different countries exhibit different coordination systems for sub-contractors and subsidiaries.

TABLE 1. COOPERATION AND DIVISION OF LABOR
BETWEEN AUTOMOBILE ASSEMBLERS AND PART PRODUCERS (1995)

	South Korea	Japan	U.S.
Ratio of Outsourcing	65	70	40
Structure of Supply Network	Single Stage	Multiple Stages	-
Means of Sourcing	Multi-Sourcing	Single-Sourcing	Multi-Sourcing
Degree of Cooperation	Middle	High	Low

Source: Korea Institute for Industrial Economics and Trade, 1997a, 365

Another important feature of PDCCs is that their profits derive from large-scale production and technological advances (Appelbaum and Gereffi 1994, 44; Gereffi 1994, 99). Mass production is representative of PDCCs, while flexible production characterizes BDCCs. The South Korean case represents significant variations from previous studies on PDCCs. First, it is an unusual case in that as a semi-peripheral nation, it has engaged in the production of a final product as well as in the less capital- and technology-intensive parts (Biggart and Guillen 1999). Second, domestic conglomerates, the *chaebol*, dominate

² In comparison, Taiwan has developed lower- and medium-end components markets in the absence of a substantial assembly sector (Biggart and Guillen 1999).

the automobile industry in South Korea, while TNCs dominate other semi-peripheral industries in countries such as Brazil and Mexico (Park 1999). Third, South Korea created its own model and indigenous technological development as a consequence of low TNC investment and the domination of *chaebol* (Park 1999). These characteristics make the South Korean automobile industry an interesting case to broaden our understanding of a PDCC in a semi-periphery, and to challenge key arguments in the PDCC analysis.

The latter part of this paper deals with the South Korean automobile industry's governance structure and linkages to domestic suppliers, sub-contractors, and foreign partners for capital investment, technology transfers, and trade. The findings will help us ascertain to what extent South Korea's experience can be replicated in other developing countries who aspire to upgrade their industrial structure by engaging in capital- and technology-intensive industries.

III. SOUTH KOREA'S AUTOMOBILE INDUSTRY: AN OVERVIEW

Appelbaum and Gereffi (1994) noted that the active support of the government, including financial support and tax exemptions for the promotion of exports, was critical in the development of South Korea's automobile industry. Also, Biggart and Guillen (1999) pointed out that the "producer-driven" automobile industry in South Korea resulted from protectionist state policies, which were favorable to the *chaebol* or large business groups such as Hyundai, Daewoo, and Kia.

The South Korean automobile industry began with President Park Chung Hee's (1961-79) ambitious plan to develop it as a key part of the broader security industry. In addition to financial support and tax exemptions, the government guided the stages of industrial development by establishing legislation to support and promote the automobile industry. It implemented protectionist strategies such as limiting imports of parts and banning imports of finished cars during the early stage of development. To help domestic producers achieve economies of scale, the government restricted the number of firms or new entrants into the automobile industry.

South Korea's automobile industry went through the following four stages: (1) knock-down kit assembly (1962-76); (2) localization of production and development of local models (1976-86); (3) mass production and mass export (1986-94); and (4) opening of the domestic market and globalization (1994-present) (KIET 1997a). In this paper, we briefly review the historical background and focus primarily on the fourth stage in which South Korea's automobile production and sales became globalized.

The South Korean automobile industry began in the 1960s with simple knockdown assembly.⁵ The Automobile Promotion Law and Automobile Industry Protection Law were announced in the early 1960s along with the Five-Year Economic Development Plan. These laws were designed to improve the local content ratio and to restrict imports

⁵ See Appendix 2 for a more detailed chronology of South Korea's automobile industry.

of foreign cars and parts. Attaining economies of scale was an important issue in the initial stage of the automobile industry as well. Thus, only one manufacturer was allowed to produce cars to achieve the requisite economy of scale. Saenara Motors was the first automobile producer in South Korea.

In 1967, the government began to allow other manufacturers to produce cars, and consequently, Hyundai Motors, Kia Motors, and Asia Motors⁴ entered the domestic car market with technological alliances with Ford of the U.S., Fiat of Italy, and Mazda of Japan, respectively. However, a limited production capacity and a small sized domestic market did not make South Korea an attractive site for foreign investors. Thus, foreign automobile producers tended to introduce models that failed in the global market, and did not make substantial investments in South Korea. As a result, expectations that these TNCs would contribute toward a leapfrog movement of industrial upgrading did not occur, and gradually the South Korean automobile industry came to be dominated by domestic corporations with ties to the *chaebol*.

Highlights of the second stage include the introduction of the Long-Term Automobile Industry Development Plan in 1973, and the Long-Term Automobile Industry Promotion Plan in 1974. These laws were intended to promote the development of South Korea's indigenous models and raise the ratio of domestic production. During the third stage, mass production of automobiles based on local models, and mass export began. Due to decreased demand as a result of two Oil Shocks in the 1970s and domestic political turmoil, the automobile industry went through major restructuring in the early 1980s. The government finally allowed only two automobile producers to manufacture passenger cars until 1987.

In 1986, the first shipment of Hyundai cars was exported to the United States. As South Korea's automobile producers exported 3 billion cars that year to the United States, they achieved economies of scale for mass production. By 1995, 51 percent of all South Korean automobile sales were for exports, compared to 49 percent for domestic sales (Park and Kim 1997; Sadler 1999). In the U.S. market, South Korean automobiles were distributed by Hyundai's regional offices (via Hyundai Motor America) and original equipment manufacturing (OEM). OEM has been the major strategy used by TNCs in re-exporting automobiles assembled at offshore plants to core nations. Hyundai employed a strategy that utilized its conglomerate business organization to create the initial impulse for export. In addition, its marketing strategy revolved around lower prices compared to other comparable cars, and was oriented toward the lower-end of the auto market. Sales were conducted through single-point dealerships specializing in Hyundai's cars, and these dealerships were organized around a strategic sales network concentrated in three regional offices—Los Angeles, New York, and Atlanta which switched to Chicago in 1989 (Gereffi 1994, 291). The relatively low price compared to car quality, and the marketing strategy of South Korean automobile companies, account for the sizeable

⁴ Asia Motors was founded in July 1965. It was incorporated into Kia Motors in October 1976 (Park 1994, 45).

market share of South Korean automobile firms in the U.S. and Canadian markets (Kim 1992).⁵

Mass production and mass export enabled the South Korean automobile producers to actively seek alliances with automobile TNCs. They also increased R & D investment. Since 1994, when South Korea's domestic automobile market was liberalized, the South Korean automobile producers have implemented various globalization strategies and increased their overseas foreign direct investment. After the Asian financial crisis of 1997, globalization efforts escalated with a series of merger and acquisition (M & A) activities and technical licensing with TNCs. There were also vigorous restructuring efforts in order to increase capital, reduce debt-equity ratios, and improve business performance. Figure 1 shows some examples of M & A activities among the leading automobile producers in South Korea including the recent acquisition of Samsung Motors by Renault, Hyundai's incorporation of Kia, and a more active technical alliance between major domestic companies and foreign automobile producers.

FIGURE 1. CAPITAL PARTICIPATION AND TECHNICAL LICENSING

Note: C.P. denotes capital participation; T.L. denotes technical licensing.

Source: Korea Automobile Manufacturers Association (<http://www.kama.or.kr/>).

⁵ Unlike South Korea, Japanese automobile companies failed when they first entered the U.S. automobile market in 1957, because the attractiveness of their products' low price could not offset their low quality. Therefore, in the mid-1960s Toyota and Nissan returned to the U.S. market with automobiles, which still had lower prices but much higher quality (Abernathy 1993, 57-58).

IV. SOUTH KOREA'S AUTOMOBILE INDUSTRY IN THE GLOBAL COMMODITY CHAIN

"The automobile is probably one of the most complex commodities that can be analyzed" from the global commodity chains perspective (Lee and Cason 1994, 227). Automobile production can be classified roughly into the following four processes: (1) raw material processing; (2) raw material, parts, and components fabrication; (3) body, component stamping and fabrication, and metal casting; and (4) engine, transmission, and other systems and sub-systems (Morales 1994, 27-28). Thus, it represents one of the most diversified production processes, requiring a high level of coordination often in a multitude of geographical nodes.

Due to the complexity of automobile production, Lee and Cason (1994, 227) suggest that the automobile industry should be subdivided into three broad segments: (1) parts supply networks; (2) assembly production networks; and (3) marketing networks. This classification is a revision of the four segments proposed by Gereffi and Korzeniewicz, which include raw material supply, production, exporting, and marketing and retailing (1990, 51). Since exporting occurs at several different stages of the commodity chain, such as that for parts and finished products, Lee and Cason (1994) argue that exporting should not be separated, but integrated into all three segments. In this paper the parts supply network will be examined rather than raw material acquisition, which is very difficult to identify.

The following section discusses the three broad segments Lee and Cason suggest in terms of the automobile PDCC in South Korea. In order to highlight the globalization of automobile producers, we revised Lee and Cason's (1994) framework: the marketing network is broadened to globalization of production and marketing. In the latter segment, we examine capital investment, technology transfers, exports, and overseas foreign direct investment as the four most important forms of globalized linkages. South Korea's automobile production is examined with a special emphasis on its linkages to the U.S. and Japanese automobile producers.

Parts Supply Networks

The strong developmental state in South Korea protected domestic industries especially during the early stage of industrialization, and fostered the growth of the *chaebol*. The automobile industry was no exception. In fact, it was protected from imports of both parts and finished products, thus allowing an extensive domestic production network to develop with the *chaebol* at the center (Biggart & Guillen 1999).

The assembler has the following three options in meeting demands for parts and components. It can produce the parts and components in its own factories, outsource them to subcontractors, or purchase the necessary parts and components from suppliers. The second and third options are different since the second is based on a very extensive hierarchical relationship between the assembler and parts producers. The U.S. automobile

producers tend to follow the third model, while South Korean and Japanese automobile producers follow the second model, with a relatively high ratio of parts and components obtained from subcontractors as shown in Table 1 (Cho 1998).

The subcontractor system in South Korea and Japan is distinct from other countries. Japanese automobile assemblers have an extensive multi-layered subcontracting system. In South Korea, although subcontractors are independent legal entities, the exclusive linkages and the presence of dominant assemblers, which are *chaebol* firms, force the subcontractors to behave like affiliates of the assemblers (Cho 1998; KIFT 1997b). For example, an assembler can reduce transaction costs by threatening to forcibly throw out a supplier, and/or demand better performance from a supplier. But the supplier has no such choice or autonomy to change the assembler. Moreover, the assembler, in order to maintain an exclusive linkage with subcontractors, does not allow the subcontractors to set up new linkages with other assemblers (KIFT 1997b, 23-28). The assemblers control the exit and entry of the subcontractors in their network (Cho 1998). This kind of a supply network lacks flexibility and transparency (Cho 1998). Fair competition based on free market principle is not practiced in the South Korean automobile assembler-supplier relationship.

The South Korean government played an important role in the development of the subcontractor network. In December 1975 the government promulgated the Law to Promote Interfirm Linkages of Small- and Medium-Sized Enterprises, which was followed by specific policies and subsidy plans in 1976. In 1977 the South Korean government designated the automobile industry as one of the industries protected by this law. The policies were intended to promote horizontal networking among automobile parts producers. The goal of law and policies was to protect the small- and medium-sized automobile parts producers by preventing both *chaebol* automobile assemblers from producing parts and TNCs from penetrating the South Korean market (Park 1999). However, the law was perceived to enhance the autonomy capacity of automobile parts producers at the expense of automobile assemblers. Thus, in 1978 due to heavy opposition from powerful automobile assemblers, the law was revised to allow a "vertical" over a "horizontal" relationship. This meant that the *chaebol* automobile producers could organize the subcontractors under its control in a vertically hierarchical network. In 1979, 15 automobile parts were designated for incorporation into a hierarchical network. In 1980 32 parts, in 1985 274 parts, and in 1991 326 parts were designated (Park 1999). As a result of this revised law, the wealth and influence of the *chaebol* automobile assemblers grew tremendously. Thus, in South Korea, a disparate relationship between the assembler and subcontractors developed, in which the former exerted too much control over the latter, in large part due to government policies.

As shown in Table 2, an overwhelming majority of automobile parts producers work with only one or two automobile assemblers. In fact, over 84 percent of all parts producers work with less than two assemblers. This shows an increase from 78.4 percent in 1996, which reflects a growing concentration of automobile assemblers and the increasing dependence of parts producers on them.

TABLE 2. LINKAGES BETWEEN AUTOMOBILE PART PRODUCERS AND AUTOMOBILE ASSEMBLERS IN SOUTH KOREA

Number of Automobile Assemblers	1996		1999		Change (1996-1999)	
	Number of Part Producers	Share (%)	Number of Part Producers	Share (%)	Number of Part Producers	Share (%)
1	657	57.1	570	65.9	87	8.8
2	245	21.3	158	18.3	-87	-3.0
3	109	9.5	80	9.2	-29	-0.3
4	59	5.1	57	6.6	-2	1.5
5	40	3.5	-	-	-40	-3.5
6	23	2.0	-	-	-23	-2.0
7	17	1.5	-	-	-17	-1.5
Total	1,150	100.0	865	100.0	-285	-

Source: Korea Institute for Industrial Economics and Trade, 1997b, 21.

Korea Auto Industries Coop Association (<http://www.kaica.or.kr/kaica/>), 2000.

A strong domestic production network of parts firms makes it nearly impossible for foreign suppliers to penetrate the industry. Furthermore, domestic parts producers are not interested in the international market; they enjoy a strong and steady demand for their product due to the state's policy for a high local content ratio. In 1988, the local content ratio of a finished product for the domestic market was 90-95 percent, and 80-85 percent for the export market (Gereffi 1994, 229). Although cars for export reveal a slightly higher proportion of imported parts in order to meet foreign consumers' expectation for higher quality and taste, it is still considerably lower than that of their counterparts in other newly industrializing countries (NICs). For example, in 1988, foreign parts in automobiles for export constituted 30-40 percent in Brazil and 45-70 percent in Mexico (Gereffi 1994, 229).

However, it is misleading to regard the high local content ratio of South Korean automobiles as a reflection of the high level of maturity and independence of the South Korean automobile industry. In fact, South Korea's automobile industry is still heavily dependent on foreign technology for the most crucial parts and does not have many advanced indigenous models (Lee 1995, 108; ITEP 1996, Park and Kim 1997, 73) showed that although the total export of automobile parts increased over 16 percent between 1993 and 1995 to over \$2 billion, imports increased even faster. What is more alarming is the fact that imports of engine and chassis parts increased sharply, resulting in an increased trade deficit in these two areas (Park and Kim 1997, 73). Figures in Table 3 display the trade patterns of various automobile parts in the mid-1990s.

Dependence on foreign manufacturers for parts in automobile export is even higher (see Table 4). The Korea Institute of Industrial Technology, Evaluation, and Planning (ITEP) (1996) calculated the dependency rate for important parts, and revealed that one of the most technologically advanced parts, the power transmission, had a dependency rate of 50 percent, 85 percent of which was on Japanese manufacturers (ITEP 1996, 44). The findings in Table 4 illustrate that South Korea's automobile industry continues

to be heavily dependent on imported parts from Japan, the United States, and Germany when dealing with the high standards for automobiles in export-destination countries such as the United States and Canada.

TABLE 3. IMPORT AND EXPORT OF AUTOMOBILE PARTS IN
THE SOUTH KOREAN AUTOMOBILE INDUSTRY

(Unit: Millions of U.S. dollars)

		1993	1995	Growth Rate (1993-1995)(%)
Total	Export	1,544	2,085	16.2
	Import	1,282	2,099	28.0
	Balance of Trade	262	-14	-
Parts of Engines	Export	103	146	19.1
	Import	452	700	24.4
	Balance of Trade	349	554	26.0
Body and Parts of Chassis	Export	385	667	31.6
	Import	774	1,304	29.8
	Balance of Trade	-389	-637	28.0
Other Parts	Export	1,056	1,272	9.8
	Import	56	95	30.2
	Balance of Trade	1,000	1,177	8.5

Source: Park and Kim, 1997, 73.

Overall, South Korea's automobile parts production is oriented primarily toward the domestic market. Sixty-five percent of parts producers responded that they do not export at all, in a poll conducted by the Korea Institute for Industrial Economics and Trade (KIET) (Park and Kim 1997, 71). Even when they export, over 30 percent of the firms replied that the share of exports in total sales is less than 25 percent (Ibid. 70). Thus, the predominant market for South Korea's automobile parts producers is domestic automobile companies, and not the world market. Findings confirm that the automobile parts network is heavily domestic with low levels of globalization.

Nonetheless, South Korea's highly integrated domestic automobile parts network is experiencing pressure to globalize, as cheaper automobile parts are available from the Association of Southeast Asian Nation (ASEAN) member economies (Cho 1998, 19-22). In response, the South Korean automobile parts producers have invested overseas to utilize cheaper labor costs in the earlier stage. The figures for average investment per case reveal that North American parts suppliers are more capital- and technology-intensive than those in other regions. They indicate that the more technologically advanced parts are produced in the core, while the more labor-intensive parts are produced in the semi-periphery and periphery countries.

Recently, overseas automobile parts production has accelerated with the broader globalization strategies of South Korean conglomerates, who seek not only cheap labor and input costs, but also access to emerging markets. Table 5 shows the diversification of the overseas parts suppliers' network in 1995, in which the People's Republic of China

TABLE 4. DEPENDENCE ON FOREIGN AUTOMOBILE PARTS FOR
AUTOMOBILES FOR EXPORTS (1992)

(unit: percent)

Automobile Parts	Imported Contents and Country of Origin	Dependency Rate on Foreign Automobile Producer		
		Japan	Other Countries	Total
Power Generator	Injector(J), Fuel Pump(U.S.), ECU(U.S.), Catalytic Converter(J), Timing Belt(G, U.K.), Alternator(G), EGR Valve(J), Actuator(J), Oxygen Sensor(J)	24.5	10.5	35
Power Transmission	Fork Shift(J), Drive Shaft Assy(J), Differential Gear(J), Reverse Gear(J), Automatic Transmission(J), All Wheel(J), Caliper(U.S.)	42.5	7.5	50
Chassis	Power Steering Pump(J), Flexible Hose(J, U.S.), Clutch Disk(U.S.), ABS(U.S.), Tire(U.S.), Bumper Board(G)			10
Body Fittings	Seat Cover(U.S.), Seat Belt(U.S.), Audio(U.S., J), Combination Switch(U.S., J), Door Lock Assy(J), Heater Control Set(J), Fuel Tank Cap(U.S.)	8	12	20
Total		14	6	20

Note: J denotes Japan; U.K. denotes United Kingdom; U.S. denotes United States; G denotes Germany.

Source: Korea Institute of Industrial Technology, Evaluation, and Planning, 1996, 44.

TABLE 5. OVERSEAS PART SUPPLY NETWORK OF
SOUTH KOREAN AUTOMOBILE PART PRODUCERS (1995)

	Cases		Investment		Average Investment per Case
	Number	Share (%)	Amount (in 1,000 U.S. \$)	Share (%)	
ASEAN	57	33.0	14,019	18.7	378.9
Malaysia	7	6.3	2,702	3.6	386.0
Indonesia	7	6.3	6,634	8.9	947.7
Thailand	2	1.8	601	0.8	300.5
Philippines	20	17.9	4,082	5.4	204.1
Vietnam	1	0.9	0	0.0	0
China	59	52.7	40,941	54.6	693.9
North America	7	6.3	7,255	9.7	1036.4
U.S.	6	5.4	5,655	4.9	609.2
Other	9	8.0	12,712	17.0	1412.4
Total	112	100.0	74,927	100.0	669.0

Source: Park and Kim, 1997, 75.

became an important supplier. ASEAN countries and the United States are also suppliers, albeit on a smaller scale than China. Access to China and ASEAN reflects the South Korean automobile producers' desire to move to new emerging markets, as the older markets are becoming increasingly saturated.

Assembly Production Networks

Assembly production in South Korea began in the early 1960s. South Korea's automobile industry developed differently from other NICs through an extensive domestic production network. South Korea's automobile industry was established with domestic capital since the automobile producers from the core nations were not interested in investing in South Korea due to the import substitution industrialization (ISI) strategy of the Syngman Rhee government (1948-60). Furthermore, other East Asian countries delivered more attractive investment conditions, enticing major automobile TNCs to invest in other areas (Kim and Lee 1994, 285). Even when the South Korean government's industrialization policy shifted from inward- to outward-oriented strategies in the mid-1960s, regulations and restrictions on the amount of foreign capital investment allowed in the domestic industry made it difficult for foreign direct investment to take hold.

In keeping with the South Korean government's reluctance to completely open the domestic automobile market to TNCs, South Korean automobile producers were slow to fully embrace their counterparts from core nations. However, with new entrants, it became imperative that the South Korean automobile producers import technology from automobile producers in the United States and Japan. At the beginning, South Korean automobile producers acquired capital from the American Big Three automakers and Japanese automobile producers. In the case of Hyundai, the company maintained a policy of keeping its brand name and self-identity in its products. In 1968, Hyundai signed an agreement for a 5-year technical collaboration with the payment of one to three percent royalties. Since Hyundai recognized the importance of foreign technology as a late entrant in the automobile industry, it had to negotiate for a 50:50 joint venture with Ford, but the three-year long negotiation ended in failure in 1972. Hyundai did not want a joint venture at the expense of domestic managerial control. Hyundai decided to acquire technologies by licensing rather than joint ventures, and in 1979, established its own R & D center. To meet the quality standards of major car markets, Hyundai also licensed more than thirty different technologies from Japan, England, and the United States, with mixed results (Kim 1992). It later signed a strategic alliance agreement with Japan's Mitsubishi Corporation, which was mainly in engineering, manufacturing, and marketing.

On the other hand, Daewoo Motors, from the beginning, entered a 50 percent joint venture with General Motors (GM) and imported models and technology developed by GM for its world car concept.

In the 1980s, South Korean automobile producers emerged as new competitors in the international market, and the first stage of globalization of South Korean automobiles

began. South Korean automobile producers currently display increasingly cooperative relations with TNCs in terms of capital and technology.

Although there were vigorous efforts for indigenous R & D, Table 6 shows that South Korean automobile producers were heavily dependent on Japanese producers for technology. The figures for technological alliances prior to 1987 reveal a staggering 185 cases from Japan compared to 43 from the United States and 31 from the United Kingdom. More recent figures show that the overall dependence on foreign firms has decreased. Nonetheless, the figures for 1992 continue to show that Japan is the most important partner for technological alliances. It is interesting to note South Korea's greater dependence on Japanese producers than on the United States producers. However, this is not that surprising since mid-level managers and floor-level workers prefer to work with Japanese firms due to their superior after-service plans and overall familiarity with the language and culture compared to those of the U.S. firms (E. M. Kim 1997, 84-89).

TABLE 6. TECHNOLOGICAL ALLIANCES AND JOINT VENTURES
IN THE SOUTH KOREAN AUTOMOBILE PARTS INDUSTRY (1992)

Partner Countries	Before 1987		1988		1989		1990		1991		1992	
	TA	JV	TA	JV	TA	JV	TA	JV	TA	JV	TA	JV
Japan	185	39	28	13	19	9	32	-	17	3	22	1
U.S.	43	19	15	9	7	11	7	-	6	2	10	-
Germany	22	6	2	2	3	6	12	2	4	1	4	1
U.K.	31	2	4	-	1	1	8	-	2	2	6	-
Other	14	2	5	2	3	1	6	1	2	-	3	-

Note: TA denotes Technological Alliances; JV denotes Joint Ventures.

Source: Korea Institute of Industrial Technology, Evaluation, and Planning, 1996, 45.

Table 7 presents the South Korean automobile producers' alliances with foreign automobile producers. The findings show that Japanese automobile makers are very popular among South Korean automobile producers. Since 1997, many of the U.S.-based automobile TNCs have exited South Korea.

A report from the Korea Institute of Industrial Technology Evaluation and Planning (ITEP) on the technological development of the South Korean automobile industry takes note that although the South Korean-developed models are sold around the world, critical software in designing and developing new models comes from abroad (see Table 4). The findings in Tables 4 and 7 indicate that both in technological alliances and imported parts, the South Korean automobile industry relies heavily on the Japanese automobile industry.

Figures in Table 8 show that the share of R & D in total investment grew over time to over 36 percent by 1997. This is an encouraging sign that South Korea's automobile industry is attempting to upgrade its products.

TABLE 7. SOUTH KOREAN AUTOMOBILE ASSEMBLERS' ALLIANCE WITH TNCs (1997)

	Contents	TNCs
Daewoo Motors	Technology	Honda (Assembly)
	Parts (Production)	GM (Battery)
	Parts (Technology)	Lexus (Cooperation in Developing Engines)
Hyundai Motors	Capital Cooperation	Mitsubishi
	Technology Transfer	Mitsubishi (Engineering, Manufacturing Technology)
Kia Motors	Capital Cooperation	Ford, Mazda
	Sales	Ford
	Technology Transfer	Mazda (Parts, Engineering)
Samsung Motors	Technology	Nissan (Engineering, Manufacturing)
	Capital	Mercedes-Benz
Ssangyong Motors	Technology	Mercedes-Benz (Van, Engine)
	Sales	Mercedes-Benz

Source: Park and Kim 1997, 35.

TABLE 8. R & D INVESTMENT IN THE SOUTH KOREAN AUTOMOBILE INDUSTRY

Item	(Unit: Billion Korean Won)					
	1992	1993	1994	1995	1996	1997
Facility Investment (%)	11,833	13,297	22,569	21,932	21,976	22,768
	(68.5)	(72.2)	(72.5)	(70.0)	(70.6)	(63.4)
R & D Investment (%)	5,438	5,124	8,568	9,392	9,132	13,122
	(31.5)	(27.8)	(27.5)	(30.0)	(29.4)	(36.6)
Total Investment (%)	17,271	18,421	31,137	31,324	31,108	35,890
	(100)	(100)	(100)	(100)	(100)	(100)

Source: Korea Automobile Research Institute, 1997.

Figures in Table 9 show that the Japanese automobile firms' share of R & D investment relative to total sales was greater than that of most other countries' automobile firms from the late 1980s to the early 1990s. But due to the bursting of Japan's bubble economy and a worldwide recession, most Japanese automobile producers decreased their R & D investment in 1993 and 1994. Many other automobile producers showed a similar decline in 1994, while South Korea's automobile producers invested more in R & D. Along with the figures in Table 8, this data reflects growing efforts by South Korea in indigenous R & D efforts in recent years. However, the Asian financial crisis of 1997, which hit the South Korean economy quite severely, no doubt negatively affected R & D investment in automobile production.

TABLE 9. INTERNATIONAL COMPARISON OF R & D INVESTMENT

(Unit: Million of U.S. dollars; %)						
Country	Company	1990	1991	1992	1993	1994
South Korea	Hyundai	269	345	319	399	479
		(4.2)	(4.5)	(4.1)	(4.5)	(4.4)
	Kia	151	165	211	252	288
		(4.2)	(4.4)	(5.0)	(4.9)	(5.1)
	Daewoo	82	83	107	106	161
		(3.8)	(3.8)	(4.9)	(3.9)	(4.8)
U.S.	GM	5,341	5,887	5,917	6,030	7,034
		(4.2)	(4.8)	(4.5)	(4.4)	(5.0)
	Ford	3,558	3,728	4,332	5,021	5,214
		(3.6)	(4.2)	(4.3)	(4.6)	(4.1)
	Chrysler	908	955	1,053	1,230	1,303
		(2.9)	(3.2)	(2.9)	(2.8)	(2.5)
Japan	Toyota	3,004	3,570	3,711	4,032	4,088
		(5.0)	(5.0)	(5.2)	(4.4)	(4.35)
	Nissan	1,517	1,764	1,816	2,056	1,955
		(5.5)	(5.9)	(5.9)	(3.7)	(3.36)
	Honda	1,176	1,376	1,544	1,650	n.a.
		(4.8)	(4.5)	(7.3)	(7.3)	n.a.
Europe	Volkswagen	1,546	1,598	n.a.	1,754	1,808
		(3.7)	(3.6)	n.a.	(3.8)	(3.5)
	Renault	1,051	1,056	1,169	1,219	1,442
		(3.5)	(3.5)	(3.4)	(4.1)	(4.3)
	Peugeot	n.a.	n.a.	991	977	n.a.
		n.a.	n.a.	(3.5)	(4.0)	n.a.
	Fiat	1,878	1,825	1,895	1,427	n.a.
		(3.9)	(4.2)	(4.3)	(4.1)	n.a.
	Mercedes-Benz	1,908	1,933	1,997	1,906	n.a.
		(5.2)	(4.8)	(4.7)	(4.9)	n.a.
	Volvo	1,193	1,061	1,061	564	n.a.
		(8.5)	(8.3)	(8.3)	(3.9)	n.a.

Note: Figures in a parenthesis means the share of R & D in total sales.

Source: Seoul Social Economy Institute, 1998, 35.

Globalization of Production and Marketing

In the 1990s, South Korean automobile producers began to actively seek ways to survive in the world market, which was becoming increasingly competitive. The following issues pressured South Korea's producers to build a globalization strategy including global management (KIET 1997b, 26-29):

- (1) Overcapacity: As the domestic market became too small to absorb the production capacity of domestic automobile producers, it was imperative to seek overseas markets.
- (2) Rising production costs: As wages in the domestic labor market rose, automobile producers sought production sites with more favorable conditions (e.g., cheaper labor and other production costs) in order to maximize profits.
- (3) Trade barriers in regional economic blocs: The South Korean automobile producers established factories within regional economic blocs to bypass trade protectionism.
- (4) Flexibility: In order to respond to rapidly changing market conditions and consumer preference, it became advantageous to have R & D bases overseas.

Recently, Hyundai released a three-staged globalization strategy to enhance its competitiveness (Hyundai Motors 1997). The three stages are: (1) the building of plain complete knock down (CKD) sites and expansion of overseas production sites; (2) overseas foreign direct investment either through a joint venture or as a single investor and the opening of local offices abroad; and finally, (3) completion of the global production and marketing network.

Hyundai is constructing the largest overseas manufacturing plant outside of South Korea in China and India, a CKD production site in Turkey, and assembly plants in China, the Czech Republic, Egypt, Taiwan, Venezuela, and Botswana. Hyundai Motors will invest about \$1.1 billion in these sites up to the year 2001 (Website <http://www.hyundai-motor.com>). As for marketing, while Hyundai relied on Mitsubishi's international marketing network and local dealers in the past, it now has its own international marketing network of 175 distributors in 158 countries worldwide (Ibid.). To cope with the growing demand for Hyundai cars and to bridge the gap in its global network, the company operates an on-line service, providing information about the nearest Hyundai car dealer and part suppliers on its home page (Ibid.).

Table 10 illustrates the extent of overseas foreign direct investment by the three major automobile producers in 1997. The figures reveal that fairly large investments were made in Eastern and Central European countries as well as in China and India. These investments represent the South Korean automobile producers' plans for a globalized production system, which target both cheap input costs and access to emerging markets. Their interest in emerging markets implies that South Korean automobile producers continue to rely on price competitiveness rather than technological innovation as their comparative advantage in the global automobile market.

Table 10 also suggests that all of the investments began in the early to mid-1990s, and actual production began only in the late 1990s. Therefore, it will take a few more

years to evaluate whether the South Korean automobile producers have succeeded in their ambitious globalization plans.

TABLE 10. OVERSEAS PRODUCTION SITES OF THE SOUTH KOREAN AUTOMOBILE ASSEMBLERS (1997)

	Region	Year of Beginning Investment	Year of Beginning Production	Amount of Investment (millions of U.S. dollars)	Production Capacity (thousand)
Daewoo	Indonesia	1995	1995	8	53
	Uzbekistan	1993	1996	658	270
	Romania	1994	1996	995	165
	Vietnam	1993	1996	32	50
	China	1993		30	5
		1994	1999	687	150
		-	1999	252	150-300
	Philippines	1993	1996	15	120
		-	1996	5	80
	India	1994	1995	943	240
	Czech	1995	1999	32	45
	Poland	-	-	340	70
		1995	-	1121	255
Hyundai	Iran	-	1997	25	53
	Turkey	-	1997	120	50
	Vietnam	-	1998	60	20
	India	-	1998	600	120
	Egypt	1993	1998	200	50
	Malaysia	1993	1998	100	20
	Indonesia	1994	1998	-	50
	Pakistan	1995	-	30	10
Kia	Indonesia	-	1998	30	50

Source: Park and Kim, 1997, 41.

V. CONCLUSION

South Korea's automobile industry exemplifies an interesting combination of core and semi-peripheral characteristics. With strong government support and protectionist strategies employed in the early stage of development, South Korea successfully transformed its automobile industry from simple knockdown assembly to a global industry in less than three decades. By the mid-1980s, South Korea was exporting finished automobiles to core markets, albeit competing primarily in the low price rather than high quality niche.

Extensive capital investments and technological alliances were made with Japanese

and U.S. automobile producers. In Latin America, the Big Three automobile makers from the United States have played an overwhelmingly central role in providing capital and technology. However, in South Korea it has been the Japanese automobile producers, such as Mitsubishi, Mazda, Nissan, and Honda, who have made extensive capital investments and technology transfers. Geographical proximity, a superior after-service system, and cultural affinity appear to have made Japanese automobile producers popular among South Korea's leading automobile producers.

Domestic corporations control the South Korean network of automobile parts production with exclusive subcontracting relations. This makes the South Korean case quite distinct from the United States, while similar to the Japanese. Subcontractors in South Korea often have exclusive ties with assemblers, and demonstrate a high level of dependence to the *chaebol*-affiliated automobile producers.

Automobile production has become increasingly globalized in the 1990s, in particular investing in semi-periphery countries to take advantage of cheaper labor and other production costs as well as to gain access to emerging markets. Data in recent years demonstrate a growing trend in global diversification which contrasts to the first three decades of automobile production in South Korea.

This paper challenges the assumptions of the PDCC analysis in two important ways. First, the South Korean case suggests that a semi-periphery can survive in the core nation-dominated world automobile market by finding its niche in cheaper cars and in emerging markets, where automobile TNCs from core nations have "graduated" from with technological upgrading. Some of the favorable international market conditions may be difficult to replicate in other semi-peripheral nations. Nonetheless, the South Korean case shows that an industry such as automobile production is not the exclusive domain of core nations.

Secondly, the South Korean case proves that the domestic government's support is critical in the development of an automobile industry. The wealth and influence of the parent *chaebol*, along with the government's supportive policies, have enabled South Korean automobile producers to dominate the domestic market and encouraged efforts to develop indigenous technology and models rather than relying on TNCs.

Recent restructuring efforts in the South Korean automobile industry since the 1997 Asian financial crisis will no doubt bring substantial changes to this industry. Kia Motors was incorporated into Hyundai Motors due to the former's bankruptcy in the summer of 1997. Thus, Hyundai constituted a 73.2 percent of the domestic market share in the first six months of 2000. Ssangyong Motors and Samsung Motors have been incorporated into Daewoo Motors. There have also been major M & A activities with foreign giant automobile TNCs. Renault, the French automobile producer, took over Samsung Motors, and Ford purchased Daewoo Motors. Thus, the number of South Korean automobile producers has gone from nine to three in the wake of the financial crisis. Discussion is still underway in some of these cases, exposing the great difficulties that arise in merging former competitors, especially with the absorption (or, more importantly, lack of there) workers. The newly restructured South Korean automobile industry consisting

of three gigantic automobile producers, two of which are affiliated with powerful *chaebol* and one with a TNC, will no doubt bring major changes to the global commodity chain of automobile production.

Future research is needed to examine the impact of this new competition system of automobile production on the domestic market and on the PDCC in South Korea, especially in light of the growing globalization trend of commodities. Although cutthroat domestic competition may decrease to a certain extent, the three automobile producers face a tough battle with the opening of South Korea's automobile market to major auto TNCs, as well as to the international platform.

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APPENDIX I

THE GROWTH OF SOUTH KOREA'S AUTO PRODUCTION CAPACITY

Source: Korea Automobile Manufacturers Association (<http://www.kama.or.kr/2/yearly5.htm>).

THE RANK OF SOUTH KOREA IN THE WORLD AUTO MARKET

Rank	Production		Export	
	Country	The Number of Cars	Country	The Number of Cars
1	U.S.	13,024,860	Japan	4,408,943
2	Japan	9,895,476	Germany	3,675,756
3	Germany	5,687,590	France	3,255,291
4	France	3,179,513	Spain	2,514,111
5	Canada	3,045,005	Canada	2,138,000
6	Spain	2,852,389	Korea	1,509,660
7	Korea	2,843,114	Britain	1,145,977
8	Britain	2,011,191	Mexico	1,073,529
9	China	1,830,323	Belgium	983,036
10	Italy	1,701,114	Italy	797,787

Source: Korea Automobile Manufacturers Association (<http://www.kama.or.kr/2/>)

APPENDIX 2

CHRONOLOGY OF SOUTH KOREAS AUTOMOBILE INDUSTRY

Year	Policies/ Key Industry Changes	Technology Development
1944	The foundation of Kyungsung Chunggong, the predecessor of Kia Motors	
1945	The foundation of Hyundai Motors Kongupsa, the predecessor of Hyundai Corporation	
1955	The foundation of Shinjin Kongupsa, the predecessor of Daewoo Motor	
1961	Industry Standardization Law	
	The foundation of Saenara Motors (Technical Alliance with Nissan)	Establishment of Saenara Motors' Assembly Line
1962	The Five-Year Automobile Industry Plan	
	The Automobile Industry Protection Law Kyungsung Chunggong → Kia Industry	Saenara's production of Blue Bird by simple assembling
1964	The Automobile Industry General Promotion Plan	Shinjin's development of a new model, Shinsungno
	The foundation of Asia Motors	
1965	The Three-Year Automobile Localization Plan with the goal of 90 percent localization by 1967 Shinjin's merger with Saenara Motors	
1966	Shinjin's technical alliance with Toyota	Shinjin's development of a new model, Corona
1967	The announcement of the permission criteria for the foundation of automobile factories The foundation of Hyundai Motors	Shinjin's development of new models, Crown & Publica
	The contracts of capital and technology investment of FIAT for Asia Motors	Shinjin's production of cargo truck
1968	The contracts for technology, assembly, sales between Hyundai and Ford	Hyundai motors' development of a new model, Cortina
1969	The Automobile Industry Promotion Plan • The First Stage (1967-1969): The establishment of auto assembly factories • The Second Stage (1970-1973): The establishment of auto parts and engine/body factories • The Third Stage (1973-1976): The establishment of production system of finished cars, localization of parts production, and reduction of auto price	Hyundai's production of cargo truck
1972	The announcement of government policies to make small automobile assemblers shut down GMK, a Joint-Stock Company of Shinjin and GM	GMK's development of a new model, Rekord Hyundai's production of Benz express bus

Year	Policies/ Key Industry Changes	Technology Development
	Heavy Industry Policy with a plan to produce 500,000 cars by the early 1980s	GMK's production of 6.5 tons dump truck
1973	The announcement of the Long-Term Automobile Industry Development Plan	Hyundai's production of Mini bus
	Kia's first export of 50 gasoline engines to Japan	GMK's production of Mini bus
	The Long-Term Automobile Industry Promotion Plan	
	<ul style="list-style-type: none"> Aims to complete Auto Industry Localization by 1975, to rationalize assembly process and to promote the parts industry The policies for the promotion of parts industry with the catchphrase one part for one company, which encourage acquisition in order to achieve economy of scale in parts industry 	
1974	The small- and medium- enterprises Promotion Law for Automobile Industry	Kia's development of a new model, Grisa
	Hyundai's first export of Pony to Ecuador	
1976	Kia's merger with Asia Motors	
	GMK's name change into Saehan Motors	
1977	Hyundai's total production of 100,000 cars	
1978	Hyundai's production of 100,000 Pony	Hyundai's production of Granada with 6-cylinder engine
1979	The selection of Automobile Industry as one of the Ten Export Strategic Industries	
	The announcement of Automobile Industry Integration Plan	
	<ul style="list-style-type: none"> Hyundai Motors's acquisition of Saehan Motors and concentration on passenger cars production Kia's concentration on producing smaller than 5 tons of Bus & Truck Free Competition in the production of larger than 5 tons of Bus & Truck 	
1980		Hyundai's development of a new model, Pony with 3 doors
	The reduction of automobile special excise tax	
	Automobile Industry Rationalization Plan	
	<ul style="list-style-type: none"> Hyundai & Saehan Motors of concentration on passenger cars production Kia's concentration on producing 1-5 ton truck and Mini bus Kia's (merger with Daelim) & Hyosung's concentration on motorcycle production 	
1981		Asia's development of AM-907 Bus with rear engine
	The announcement of Machine Industry Promotion Plan	
	<ul style="list-style-type: none"> Aims to promote automobile components exports, industrialization, and competitive small car model development 	

Year	Policies/ Key Industry Changes	Technology Development
1983	Saehan's name change into Daewoo Motor	
1984	The government approval of Hyundai and Daewoo Motor for Diesel Engine Producers	
1985	1 million cars owned by Korean	Hyundai's development of a new model, Excel with 5 doors
1987	Abrogation of Automobile Industry Rationalization	
1988	Dongah's name change into Ssangyong Motors Korea's production of 1 million cars	Kia's production of Pride with 5 doors
1990	Reduction of Automobile Import Tariffs from 25 percent to 20 percent	
1991	Reduction of Automobile Import Tariffs from 20 percent to 17 percent Opening the domestic distribution market	Hyundai's success in developing engine and automatic transmission only with indigenous technology for the first time in Korea
1993	Reduction of Automobile Import Tariffs from 17 percent to 15 percent Reduction of Automobile Imports Tariffs from 15 percent to 10 percent	Daewoo & Asia Motors production of automobiles using LPG
1994	Samsung Heavy Industries' technical alliance with Nissan Samsung Heavy Industries' launching of producing dump trucks Reduction of Automobile Imports Tariffs from 10 percent to 8 percent	Hyundai's development of a new model, Avante Touring (Wagon)
1995	The foundation of Samsung Motors Korea's 1 million automobile exports for one year	Kia's development of a new model, Sportage (Wagon) Hyundai's production of cargo trucks with Q-engine
1996	10 million cars owned by Korean Daewoo's acquisition of Ssangyong Motors	Hyundai's production of electro-mobiles Samsung's development of a new model, SM5.20/5.25
1998	Business swap between Samsung Motors and Daewoo Electronics Co. Hyundai's acquisition of Kia's Motors	Hyundai's development of new models, EF Sonata & Grandeur XG Ssangyong's development of a new model, Chairman

Source: Korea Automobile Manufacturers Association (http://www.kama.or.kr/2/ke_1.htm/), 2000.