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KOREAN INDUSTRIALIZATION AND THE EAST ASIAN DIVISION OF LABOR: THE CASE OF THE AUTOMOBILE INDUSTRY

By

Yong-Joo Lee

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ABSTRACT

KOREAN INDUSTRIALIZATION AND THE EAST ASIAN DIVISION OF LABOR: THE CASE OF THE AUTOMOBILE INDUSTRY

By

Yong-Joo Lee

The purpose of this study is to explain the rapid development of the Korean automobile industry. Among the Asian Económic miracles, the emergence of the Korean automakers as world class producers is most remarkable. The specific analysis of the Korean automobile industry enables us to guess a more concrete picture of the economic miracles of the Four Tiger countries.

The intense competition between the Japanese automakers and the U. S. Big Three, the high labor productivity and low labor costs of the Korean auto firms, and favorable Korean domestic economic conditions resulted in an international division of labor between the Korean automakers and the TNCs in the 1980s. While the Korean auto firms were able to get upgraded technologies and financial resources from their international partners, the TNCs bought low-cost cars and components from their Korean partners, and sold their high-end products and licensing fees.

The Korean automakers improved their technological capacities through licensing and self-development. The international partners of the Korean automakers were major

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sources of upgraded technologies. In the 1980s, the Korean automakers attempted to introduce flexible manufacturing. However, they failed to accomplish it. At best, they adopted the new process technologies which enabled an increase in production efficiency. In the late 1980s, the Korean auto firms experienced production decline due to the skyrocketing labor costs. Their inefficient production system could not offset the effects of a rapid rise in wage. As a consequence, Korean automakers lost international competitiveness. This research found that the product cycle dynamism in the East Asian economic bloc is most responsible for the development of the Korean automobile industry. Differences between the Korean automobile industry and that of Latin America are explained by differences in regional economic structure. Within the Korean automobile industry, the difference in business performance between Hyundai and Daewoo also demonstrates the validity of the product cycle theory. The product cycle dynamics explain the development process of the Korean automobile industry and predict its future long run direction.

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KOREA

KOREAN INDUSTRIALIZATION AND THE EAST ASIAN DIVISION OF LABOR: THE CASE OF THE AUTOMOBILE INDUSTRY

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Chapter I. Introduction

1. Problems

The industrial development of the Four Tiger countries(South Korea, Taiwan, Hong Kong and Singapore) is characterized as an economic miracle in world economic history. Unlike other developing countries, they succeeded in retaining economic surplus, and made substantial capital accumulations. For instance, Taiwan has the largest foreign reserve($88 billion) in the world(Stroud, 1992).

Among the economic miracles of the Asian New Industrialized Countries(NICs), the development of the automobile industry in South Korea is most remarkable. The automobile industry is, by nature, capital and technology intensive. Transnational corporations(TNCs) based in advanced countries still dominate the world automobile industry. Most automobile industries in developing countries are run by transnational auto companies. However, in the case of South Korea, the automobile industry has been rarely influenced by foreign capital. The Korean automobile industry has been run by indigenous capital. It has grown at unprecedented speed.

The Korean auto industry originated in the mid 1950s, when civilian motor vehicles were rebuilt from U. S. army jeeps(Global Business Consulting, 1987: 1). In 1990, the Korean Big Three(Hyundai, Kia, and Daewoo) were ranked,

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sixteen, twenty three, and twenty six respectively among the top 40 world vehicle manufacturers(World Motor Vehicle Data, 1992). Hyundai Motor Company, the largest automaker in South Korea, is the first one among developing countries to export its cars successfully under its own brand in world markets.

Marketing and distribution costs, as well as the expense of frequent design change, make it extremely difficult for developing countries to achieve a competitive advantage in the world car markets(Clifford, 1992b). As automakers in a developing country, the Korean Big Three succeeded in entering the world markets. Their example has had a profound impact upon ideas about industrialization in developing countries.

The main purpose of this research is to explain the process by which Korean auto firms came to obtain international competitiveness in world markets. Because the Korean automobile industry achieved dramatic success in the 1980s, the research analyzes this period extensively. The relationship between indigenous capital and foreign capital likely played a critical role in improving the international competitive advantages of Korean automakers. How did Korean auto firms develop indigenous ownership? How were the Korean Big Three able to maintain their indigenous equity shares and managerial rights, while being involved in the international division of labor? How did Korean automakers obtain product and process technology from their international partners(transnational auto corporations)? How did Korean auto

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firms accomplish cost competitiveness, the most important resource for their international competitive advantage?

This research attempts to answer these research questions by a case study of the Korean Big Three. Especially, Hyundai Motor Company(HMC) will be analyzed extensively because it has been most successful among the Korean Big Three. HMC has the biggest domestic market share, the highest export record, and the highest local content rate. The analysis of Hyundai's case will answer the question of how corporations in developing countries are able to achieve international competitiveness through the international division of labor.

2. Theories and Literature Review

Since this study deals with the international division of labor in the automobile industry, the relevant theories about international production systems will be reviewed. The emergence of new product and process technologies have changed the whole picture of the world automobile industry. Thus, the issues of new product technologies and a new type of production relations will be examined carefully. Understanding the big picture of Korea's industrial development is also critical in analyzing the development of the Korean automobile industry. Thus, the relevant literatures concerning Korea's industrial development will also be reviewed briefly.

A. Internationalization of Production System

A few hundred manufacturing corporations control a large fraction of the world's productive resources. Thus, the strategies by which transnational corporations organize and locate their production processes in the various world's places are critical international issues. Changes in the organization and location of transnational production chains can determine growth and decline, prosperity and depression among cities, regions and even nations(Hill, 1989a). In the modern world economy, manufacturing activities take place beyond national boundaries because capital and technology are very mobile.

Frobel, Heinrich and Kreye(1980) explained the new internationalization tendency known as The New International Division of Labor(NIDL). This new concept abolished the old belief that a few industrialized countries and many developing countries are integrated into the world economy through raw material exports. Frobel and his colleagues(1980) argued that the processes of mass production are standardized to a high degree and have been separated into simple, time tabled, closely standardized operations. Given modern technology of transportation and communication, routine operations of this nature can be best carried out in developing countries. The aim is to utilize international industrial reserve army, that is, a labor force which is adequately skilled, almost inexhaustible in number, highly motivated, and satisfied with

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There are three important factors in the development of "the new international division of labor": the annexation of workers to a single operation increases productivity; the fragmentation of skills increases management's control over labor; and maximizing the replacement of skilled labor by simple labor reduces labor costs(Frobel et al., 1980). In the context of NIDL theory, capital is shifted from advanced countries to developing countries because of cheap labor in most cases.

Hill(1987) analyzed "the new international division of labor" in the automobile industry. He argues that juxtaposing present to past reveals three phases in the internationalization of the front-running U. S. automobile industry, roughly 25 to 30 years apart; the late 1920s, the late 1950s, and early 1980s. All three phases have certain features in common. Each occurred in a period of economic slump, stagnant domestic demand, excess capacity, and rising national protectionism. According to him, we are now in the midst of the third phase of internationalization in the automobile industry.

The third phase conforms in the following particulars to the trajectory forecast by the NIDL theory: (1) **Global competition**. By the 1970s, European and Japanese auto firms had reached the economies of scale required to challenge the monopoly held by U. S. auto companies in the world markets.

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(2) **A Global Market.** The oil shocks of 1973 and 1979, and government regulations to promote higher fuel efficiency and safety, led to a big expansion of the market for small, fuel-efficient cars in the United States and Canada and an unprecedented convergence in product characteristics between North American and the rest of the world. (3) **Global Integration.** The global convergence in car-buying habits afforded car manufacturers unprecedented opportunities to pursue a global strategy, one where firms produce parts and assemble finished vehicles in different countries depending upon the advantages offered in each, and where they integrate their operations on a transnational plane(Hill, 1987).

One expression of the global integration strategy is the **world car** - designing cars for production in all major markets to gain economies of scale in product development, component design and production. Another expression of global production is **global sourcing** - taking advantage of lower costs and other opportunities provided by locating production in export platform based in developing countries.

While NIDL theory is supported by some empirical cases such as 'the world car strategy' and 'the global sourcing strategy', it is contradicted by other empirical cases. Hill(1987) argues that the major tendency in direct investment today is cross penetration: companies based in wealthy countries are investing in the markets of other wealthy countries largely to get behind tariff walls and protect their

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markets. In the case of the world automobile industry, direct investment in the poorer nations is still a small percentage of total outlays by transnational auto corporations.

The empirical study done by Cohen contradicted the NIDL in the automobile industry. According to this study, Ford compared the costs of producing a car at four different locations in Europe. Although wages in Spain were only 40 percent of the level paid in Saarlouis(Germany), the fact that efficiency was 10 percent less, and that material costs were higher meant that there was little advantage in terms of direct costs in locating in Spain. However, Ford decided to site a new car plant in Valencia in Spain because the major source of lower cost of Spanish production was an export subsidy of 13 percent of the value of exports paid by the Spanish government(Jenkins, 1985: 68). This empirical case can not be explained by NIDL theory.

The remarkable growth of Japanese automobile industry is little related to NIDL theory. Hill(1987) argues that the advantages of Japanese automakers came primarily from a home centered, export oriented, distinctive production system(lean production) which generated higher productivity and therefore allowed domestic companies to produce cars for much less than their international competitors. The Japanese production system departs from tenets of mass production and assembly line work originally applied in the U. S. auto industry and projected onto the globe by the NIDL theory.

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The theory of "new international division of labor" is very meaningful in the sense that developing countries can now take part in international division of labor as manufacturers, not simply as suppliers of raw materials. In this context, this theory may be applicable to the Korean automobile industry which has been involved in the international division of labor. However, NIDL theory has some limitations in explaining the internationalization of the Korean automobile industry. First, this theory disregards internal factors which contributed significantly to the development of the national economy. NIDL excludes 'the role of the state' and 'the role of domestic capital' in the process of the internationalization. In the case of the Korean automobile industry, internal dynamics must be considered very carefully.

Second, NIDL theory failed to recognize the emergence of the new production system and its impact upon developing countries. NIDL regards cheap labor as the most critical factor in the internationalization process. However, the emergence of new production system makes labor costs less significant than before.

B. The Emergence of New Technology

The application of new technology such as microelectronics and new materials to manufacturing has been prominent in the late 20th century. Product and process

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technology in the automobile industry have changed very rapidly.[1] Product innovations in the automobile industry reversed the evolution toward maturity in the product life cycle.[2] Clark(1983) argued that product innovation in response to the oil shock in the 1970s resulted in the revitalization of the automobile industry. The emergence of a new production system changed the world automobile industry dramatically. Since the days of Henry Ford, the auto industry has served as a model of economic expansion and technological progress based on mass production. But from the mid-1970s, sweeping changes in markets and technology have transformed international competitive conditions and spurred automobile manufacturers in every country to experiment with new strategies based on greater product diversity and more flexibile methods of production(Tolliday and Zeitlin, 1986).

The new production type, which is characterized as flexible manufacturing system(FMS), was theorized by Piore and Sabel(1984). Flexible manufacturing is a PostFordist model of industrial development which combines the advantages of craft

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[1]Product technology means product know-how. Process technology is the method of making a product. For example, craft or mass production method using assembly line can be considered as process technology.

[2]Product life cycle means that a product passes through the stage of introduction, growth, maturity, and decline through its life time. In the late 20th century, the automobile industry was believed to be in maturity stage. In the stage of introduction and growth, product technology is the most important resource for competitive advantage. In the maturity stage, cost is the most critical factor for competitiveness.

with the most advanced information processing and telecommunication technology(Hill, 1989a). FMS includes industrial robots,
Computer Aided Design(CAD), Computer Aided Manufacturing(CAM), and Computer Integrated Manufacturing(CIM). These new process technologies enable manufacturers to obtain enormous manufacturing flexibility and cost saving. By employing a flexible manufacturing system, automakers can reduce plant size and switch models very quickly at low cost(Hoffman and Kaplinsky, 1988). However, the increasing complexity of the product and difficulties of integrating automobile subsystems experiencing different rates of innovation keep research and development costs high and create financial problem for small manufacturers(Tolliday and Zeitlin, 1986: 20).

Because of the emergence of the new production system which is highly automated, the importance of labor costs in the automobile industry began to decrease. Thus, auto firms in developing countries can no longer survive with low labor costs alone. Womack(1990) argued that the new production system has created a new threshold for product quality that no producer can hope to offset merely through low prices based on low wages. As a result, according to him, car producers in developing countries must become lean producer as well.

Altschuler(1984) argued that the new process technologies have shifted the focus of thought about the future geography of production location from the less developed countries to

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the concentrated production of most components near the point of final assembly in the developed countries. He had a pessimistic view on possibilities of creating an automobile industry in developing country. The MIT study on the world automobile industry predicted that Korean automakers would not export their cars in the world markets(Altschuler, 1984). This study failed to predict the remarkable growth of the Korean automobile industry in the mid-1980s because the study disregards internal factors which contributed to the development of the Korean automobile industry. This research emphasized technological aspects, while it rarely considered non-technological aspects such as institutional structure and capital formation process which are critical resources for industrial development in South Korea.

C. Korea's Industrial Development

a. Geopolitical Structure

Cumings(1987) analyzed Korea's industrialization process by employing Wallerstein's world system theory. Wallerstein(1974) advocated a "one world system" based on a division of labor, among core, semiperiphery, and periphery areas. Surplus flows from periphery to semiperiphery, and from semiperiphery to core. According to Cumings(1987), Korea and Taiwan were semiperipheries to Japan as core during the colonial days(1910 - 1945). Korea and Taiwan were used as Japan's strategic spots for military and economic invasions

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In the late 1960s, the Northeast Asian geopolitical structure, which was established during the colonial days, emerged again. As Japan began to hold economic hegemony in this region, she assumed a role of core. Cumings(1987) employed a "product life cycle model" in explaining Northeast Asia's new economic order. He argued that product or components in which Japan is no longer competitive, are shifted to South Korea or Taiwan. Japan retains high value-added products or components which are more technologically sophisticated. This research will explore how the product life cycle works in the international division of labor between Japan and Korean automobile industry.

b. Industrial Structure

Foreign capital and technology were heavily involved in Korea's industrialization in the early stage. However, Korea has succeeded in maintaining indigenous ownership and achieving huge capital formation by the Chaebol -- big business conglomerate. Stallings(1990) argued that in the early stage of industrialization, Korea was heavily dependent upon foreign capital. During the same period, Brazil and Mexico relied on domestically generated funds. However, in Latin America, reliance on foreign capital gradually has increased, while in East Asia, the role of foreign savings has decreased dramatically. South Korea have began to repay her

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South Korea' economy has been dominated by big domestic capitals -- Chaebols. Gereffi(1990) argued that the largest firms in Latin America are state-owned enterprises or foreign subsidiaries of multinationals, while local private companies are dominant firms in South Korea. South Korea emerged as one of the world's major motor vehicle production sites in the mid-1980s. South Korea automobile companies began to aggressively target the U. S. market for exporting sales and eventually foreign direct investments in Korean manufacturing subsidiaries, a pattern that even Brazil has not tried to follow. South Korea's large, integrated domestic automakers have huge financial resources to fund long-term investment and product development at home and overseas, while Brazil auto exports are results of the global sourcing strategies of American, Japan and European transnational auto corporations(Gereffi, 1990).

The research asks how did Korean automakers pool capital? How did the Chaebol structure affect their capital formation processes? How did Korean auto firms maintain their equity ownership and managerial rights?

C. Catching-Up Process

Although Korea was a late industrializer, the speed of her catching-up process has been very rapid. Korea has followed Japan's development model. In the 19th century, the

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United States and Germany caught up with Great Britain on the basis of innovation. However, Japan utilized cheap productive labor and strong governmental protection in her catching-up process. Japan shifted her concentration from light industries to heavy and chemical industries. South Korea has taken similar steps for her industrial development. In the progression from light industries to heavy industries, Korea needed to obtain more science-based technologies for which Korea had little expertise. Like Japan, Korea relied heavily on foreign know-how in the catching-up process(Amsden, 1989). Amsden and Kim(1985) argued that the form of technology acquisition has tended to change, as technology itself has become more science-based and as the firm has come to be viewed less as a means to earn a livelihood and more as a means to earn a profit. In Korea, massive imports of foreign licenses and assistance have been viewed as a means to attain technological independence, and thus as part of a large effort, in both public and private spheres, to avoid foreign control. Korea's industrialization has occurred almost exclusively on the basis of nationally owned rather than foreign-owned enterprise. Foreign technical assistance has been purchased in preference to depending upon foreigners to run Korean plants. Korea attempted to build in-house technological capability. The preponderance of foreign technical assistance came from Japan, a fact that gave Korea an edge over other late-industrializing countries that were

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culturally and geographically further afield than Korea from Japan. Even though Japan is not generous in technology transfer, Korea has been able to learn the most efficient production techniques and manufacturing know-how from Japan(Amsden, 1989)

Amsden(1989) argued that state role, huge capital formation by Chaebol, highly qualified managers, and highly educated work force who were willing to work at low wages, contributed significantly to the rapid industrial development in South Korea. Among them, she regards state role as the most critical factor. While she rightly considers domestic institutional factors very important, she wrongly disregards external factors such as international relation issues.

3. Alternative Models

There are three major perspectives on industrial development of the Asian NICs; The dependency view(Bello and Rosenfeld), State-centered view(Amsden), and Regional Economy view(Cumings).

A. Dependency View

Bello and Rosenfeld(1990) have a pessimistic view on rapid industrial development of the Asian NICs. They demystify the lightening success of South Korea, Taiwan, Hong Kong, and Singapore, revealing many of the flaws of the NIC experience. Bello and Rosenfeld(1990) argue that the Asian NICs still lack

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independence and significant resources. The Asian NICs heavily rely on Japanese and U. S. capital and design innovations. They claim that South Korea and the other Asian NICs suffer from chronic technological dependence. Thus, according to them, the Asian NICs would have to stop dreaming of competing with the major industrial powers on world markets. Bello(1993) argues that the regional division of labor in East Asia even deepened the technological dependence of the Asian NICs. However, many empirical cases contradict this extreme argument. The NICs have expanded their benefits even in advanced industries. The automobile and computer industries in South Korea and Brazil are good examples. Relying on more accessible niches, the NICs have produced and exported their own innovations. They are gradually moving to high technology areas(Donner, 1991).

B. State-Centered View

Amsden, who has a sophisticated modernization perspective, argued that Korea's rapid industrial development resulted from the advantages that a late industrializer has. She analyzes domestic institutional factors such as state and business structure carefully. Amsden argued that the huge capital formation by Chaebol, highly educated managers and workers, and distinctive state role are crucially responsible for Korea's industrial success. Especially, she regards state role as the most important factor(Amsden, 1989). Amsden

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predicted that Korea would become Asia's Next Giant in the late 1980s. However, her extreme optimism is contradicted by the current sluggish Korean economy.[3] She seldom considers the limitations of Korea's industrial development. Amsden did not take account into geopolitical structure or international relation issues.

C. Regional Economy View

Cumings views Korea's industrial development in the context of the regional economic structure in East Asia. Cumings(1987) argued that Korea and Taiwan were semiperipheries to Japan as core during the colonial days(1910 - 1945). This regional structure emgerged again in the late 1960s. He employed a product cycle model in explaining East Asia's industrialization. Korea's industrialization has followed Japan's through a classical product-cycle industrialization pattern. As Japan moves up toward high value-added products, she shifts low value-added products or components to South Korea(Cumings, 1987). This research was conducted on the basis of the framework of product cycle theory.

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[3]At present, no one can expect South Korea to be a next Japan. Korea is strongly challenged by new late industrializers such as China and Southeast Asian countries in labor intensive sectors, while Korea is threatened by process innovations of advanced countries.

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4. Research Issues and Research Strategies

The main objective of this research is to examine the process by which Korean auto firms obtained international competitive advantages through the international division of labor. This study explores how automakers in developing countries can overcome barriers such as technical backwardness and invasion of foreign capital by the investigation of the case of HMC as well as the other two Korean auto firms. The rapid growth era in the 1980s and the stagnation period in the early 1990s is particularly emphasized.[4]

A. Research Issues

There are three major research questions as follows.

a. The reasons for the incorporation of Korean automobile industry into the international division of labor will be studied. In what context did Hyundai and the other two Korean auto firms take part in the international division of labor? What were the major motivations among Korean automakers for participation in the international division of labor, and what were the major incentives for foreign TNCs?

b. This study will explore how Korean auto firms engaged in capital formation. How did Hyundai's Chaebol structure affect its capital formation? How did Korean auto firms maintain their equity ownerships and managerial rights in the process

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[4]When the study explores the history and development of Korean automobile industry, it also covers the 1970s.

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c. How Hyundai and the other two Korean automakers catch up with the TNCs with respect to technological know-how.
d. What kind of production system do the Korean auto firms have? In addition, suppliers and labor relations will be studied. How did Korean automakers respond to the international emergence of a new production system?

B. Research Strategies

The research strategy is comparative. First, the research compares the three auto company alliance relationships with foreign firms; Hyundai-Mitsubishi, Daewoo-General Motors, and Kia-Mazda-Ford. The relationship between Hyundai and Mitsubishi turned out to be more developmental than the other relationsips. Also, comparisons among the three Korean passenger car companies are made. Hyundai Motor Company has been the most successful, while Daewoo Motor Company has been least successful. This comparison will help answer research questions about major motivations among Korean automakers for participation in the international division of labor, and the major incentives for foreign TNCs. Also this comparison will explain how Hyundai and the other two Korean auto firms caught up with the TNCs with respect to technological know-how.

Secondly, comparisons are made between the Korean automobile industry and that of other NICs. This research compares the development of the Korean automobile industry and

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that of the Latin American NICs, such as Mexico and Brazil. The Asian NICs have a different historical and geopolitical environment, compared with the Latin American NICs. Comparisons between the Korean automobile industry and that of Taiwan is also made. Korea and Taiwan, as Asian NICs, have similar geopolitical structures. But the development of the automobile industry is definitely different in each country. This comparison will answer how Korean auto firms maintained their equity ownerships and managerial rights in the process of participating in the international division of labor. This comparison will also answer the research question how Korean automakers took part in the international division of labor.

Thirdly, the role of state and institutional structure is compared between Korea and Japan. Korea's developmental state and its institutional structure such as Business Conglomerate, known as Chaebol, have been developed under the influence of Japan. However, there are some differences between the two countries. This comparison will show how Korean auto firms engaged in capital formation and how the Chaebol structure affects capital formation. This comparison will also answer the research question how Korean auto firms maintained their equity and managerial rights in the process of the participation in the international division of labor.

Finally, comparisons are made between production systems: mass production versus the flexible manufacturing system. The new production system is characterized by flexible

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manufacturing, the conventional system by mass production. This comparison will show how Korean automakers responded to the international emergence of a new production system.

The major data sources for this research are documents and interviews. Data were collected from governmental reports, corporate reports, national statistics, and annual reports of manufacturers's associations. Documentary data were also collected from trade journals and corporate publications. These data were obtained from Korean, American, and international sources.

In order to collect comprehensive information on the Korean automobile industry, I consulted the publications of the Ministry of Trade and Industry, Korean Automobile Manufacturers Association, and Korea Auto Industries Coop. Association in South Korea.[5] These reports provided the big picture on the trends in the Korean automobile industry. I also obtained the collected historical materials and corporate reports from Hyundai and the other two Korean auto firms. These data reveal the history and business performance of each Korean automaker.

In order to investigate the history of capital accumulation of Korean auto firms, I consulted the financial analysis for each Korean automaker published by the Korea

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[5]The annual report of the Korean automobile industry published by the Ministry of Trade and Industry and the annual report of the Korean automobile industry published by Korean Automobile Manufacturers Association and Korea Auto Industries Coop. Associations.

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Credit Evaluation Company. For technology-import and technological development, I collected information from the Korean Industrial and Technological Development Association(KITDA) and the Ministry of Trade and Industry.[6] I also interviewed engineers in Hyundai America Technical Center Inc.(HATCI) for information on technological development.

Finally, I consulted "World Motor Vehicle Data", "Ward's Automotive Yearbook", "Automotive News Market Data Book", and "Automotive News". I also obtained information from business journals and newspapers.

This chapter has reviewed literature, raised research issues, and discussed research methods. Chapter II deals with trends in the world automobile industry. Especially, the emergence of Japan as an auto giant and the new production system are described in detail. The development of the automobile industry in the NICs is described and comparisons are made among them.

Chapter III deals with the development of the Korean automobile industry. First of all, the industrialization process of South Korea is analyzed by considering external dynamics, industrial structure, and the role of state. And the history of the Korean automobile industry is fully described. Also, the capital formation processes of the Korean Big Three

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[6]Their publications include the "Report on Technology Imports" published by KITDA and the annual publications of the Korean automobile industry published by the Ministry of Trade and Industry.

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Chapter IV deals with the internationalization of the Korean automobile industry. The internationalization process is analyzed by considering the dynamics of the world automobile industry and motivations of the Korean automakers and their international partners.

Chapter V deals with the technological development and the production system of the Korean automakers. This chapter will explain how the Korean automakers developed product technology. And the production system of the Korean automakers is fully described. In addition, the suppliers and the labor relations of the Korean auto firms are considered in the context of the production system.

Chapter VI deals with the limitations and future aspects of the Korean automobile industry. This Chapter analyzes the development of the Korean automobile industry in the context of the regional division of labor, using the concept of product cycle, known as the flying geese model. The comparison between the Korean automobile industry and that of the Latin American NICs is made in terms of their regional economies.

Chapter VII summarizes the research results, and gives concluding remarks.

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Chapter II. The World Automobile Industry

1. The Rise of Japan as an Auto Giant

A. Fordism and the Automobile Industry

The old production paradigm, Fordism, developed by Henry Ford, dominated the production mode of the automobile industry until the mid-1970s. Fordism is characterized as a mass production system: the manufacturing of standardized products in huge volumes using special-purpose machinery and unskilled labor(Tolliday and Zeitlin, 1986). The key to mass production is the complete and consistent interchangeability of parts and the simplicity of attaching them to each other. Both the interchangeability and simplicity gave Henry Ford tremendous advantages over his competitors(Womack et al., 1990). Ford grasped the vast latent demand for cheap, reliable, basic transport in the American Midwest with its prosperous but isolated farms and small towns. The model T, ruggedly designed, easy to repair and priced well below its competitors sold in unprecedented numbers, jumping from 6,000 in 1908 to 189,000 in 1913 and 802,000 in 1917 to reach a total of 15 million by 1926. As sales of the Model T soared, capturing 55 percent of the American market in 1921, Ford's prospects seemed limitless and Fordism to define an international standard of modern manufacturing practice(Tolliday and Zeitlin, 1986: 2 - 3).

Ford's mass production system dominated the world auto industry for more than a half-century. This production paradigm had been adopted in almost every sector in North America and Europe. The supremacy of Ford Motor Company was challenged by General Motors(GM) in the early 1920s. GM's innovations such as product diversity and decentralization of the organizational structure began to surpass Ford. In contrast to Ford which produced only one model -- the Model T, General Motors developed a five model product range that ran incrementally from cheap to expensive, from Chevrolet to Cadillac. This strategy might fully accommodate potential buyers of every income category. Sloan, the president of GM at that time, resolved the conflict between the need for standardization to cut manufacturing costs and the model diversity required by the huge range of consumer demand in the United States. Sloan's innovations were a revolution of marketing and management of the auto industry(Womack et al, 1990: 40 - 42).

European automobile producers followed Ford's mass production strategy. In the 1960s, as income rose, European automakers began to offer a wider range of models in order to maintain their coverage of increasingly diverse national markets. But European automakers, unlike their American counterparts, could not integrate their differentiated product ranges into coherent families of models based on common components. Europeans maintained their practice of developing

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each model separately, which allowed greater scope than in the United States for continuous improvement and technical innovation, but made it difficult to match the economies of scale of their mass market best seller across the whole of a scattered and unbalanced product line. So, in Europe as in the United States, by the late 1960s Sloanist marketing strategies based upon product differentiation coexisted uneasily with automobile manufacturers' continuing commitment to Fordist production strategies based on standardization and economies of scale(Tolliday and Zeitlin, 1986: 6 - 7).

The U. S. auto companies dominated the world automotive industry for decades. The Big Three(General Motors, Ford, and Chrysler) maintained absolute positions in production and market share in the world markets as well as domestic market. In the late 1950s, the U. S. pie in the world automobile production began to slide. Since then, the share of the import in the U. S. market has risen.

B. The Growth of the Japanese Automobile Industry

Since the 1960s, the Japanese automobile industry has grown dramatically. During this period, the domestic car sales as well as exports began to increase in Japan. In 1965, the domestic sale of passenger car was only 587 thousands. However, in 1970, it rose to 2,373 thousands, and in 1975, it was 2,729 thousands. In 1965, the car export of Japan was only 101 thousands, accounting for 14.5 percent among the

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total sales. But in 1980, it rose up to 3, 947 thousands, accounting for 56. 5 percent(For more details, see Table II - 1).

The ratio of export among total production had grown rapidly in the Japanese automobile industry. The pie for the U. S. market in the Japan's car export increased from 21.8 percent in 1965 to
50.1 percent in 1985. Also, the share for Europe rose up

Table II - 1: Passenger Car Production and Exports in Japan

Unit: thousand, %

	production (A)	domestic sale	export(C)	C/A	U. S. (D)	D/C	Europe(E)	E/C
1965	696	587	101	14.5%	22	21.8%	14	13.9%
1970	3,179	2,373	726	22.8%	324	44.6%	102	14.0%
1975	4,568	2,729	1,827	40.0%	712	39.0%	483	26.4%
1980	7,038	2,854	3,947	56.1%	1,819	46.1%	1,003	25.4%
1985	7,646	3,104	4,427	57.9%	2,216	50.1%	1,094	24.7%

Source: Japan's Automobile Manufacturing Association, Annual Statistics of Automobile Industry(1966 - 1986).

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up significantly as well. The Japanese auto industry became export- oriented. Especially, the U. S. market came to be a major target for Japanese automakers.

The U. S. automobile industry was surpassed by the Japanese in the early 1980s. In 1960, the Japanese share in the world automobile production was only 1.3 percent, while the U. S. share was 52.4 percent in the same year. In 1980, the Japanese share reached 24.0 percent, and Japan began to run ahead of the U. S. with respect to the passenger car production. Except for the period from 1984 to 1986, the Japanese automobile industry has maintained the top position in the world(For detail, see Table II - 2). During the past 30 years, the share of Germany and France in the world automobile production have been relatively stable. Japan's share has increased gradually, while the United Kingdom and the United States has reduced steadily.

The growth of the Japanese automobile industry has been remarkable since the oil shocks in the 1970s. The penetration by Japanese cars into the United States auto market was impressive during the oil crises. Every year new motor vehicle sales of Japanese vehicles increased significantly. In June, 1975, Toyota moved ahead of Volkswagen, and Nissan surpassed Volkswagen the following year. Honda became the third largest importer in 1978, and Mazda surpassed Volkswagen in 1978. In 1980, Toyota and Nissan each sold more than half a million in the United States, followed by Honda with 375,252(Market Data

Table II - 2 Passenger Cars of the World Production

Unit: percentage

	Germany	France	U. K.	Japan	USA
1960	14.2	9.0	10.6	1.1	52.4
1965	14.2	7.1	8.9	3.6	48.6
1970	15.6	9.9	7.0	14.0	28.9
1975	11.5	10.1	5.0	18.1	26.6
1980	12.0	10.0	3.3	24.0	21.8
1981	12.8	9.3	3.4	24.9	22.3
1982	13.8	10.2	3.3	25.3	18.7
1983	12.8	9.8	3.5	23.7	22.4
1984	12.2	8.8	2.9	22.8	25.1
1985	12.7	8.0	3.2	23.4	25.0
1986	12.9	8.3	3.1	23.4	23.5
1987	13.0	9.1	3.4	23.5	21.2
1988	12.5	9.3	3.5	23.5	20.4
1989	12.9	9.6	3.7	25.5	19.2

Source: World Motor vehicle Data 1991 edition

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Book Issue, 1980: 46).

The oil shocks in the 1970s transformed the world automobile industry out of a mature industry characterized by slow growth of demand for a well-defined and technologically stable product. The two oil crises in the 1970s drove up oil prices dramatically. Consequently, the fuel-efficient cars were demanded by consumers. Table II - 3 shows new consumer tastes in the response to the oil crises in the 1970s. Before the oil shocks(1972), the shares of subcompact and compact in the U. S. car market were only 9.6 percent and 17.2 percent respectively. However, in 1975(after the oil shock), subcompact accounted for 16.4 percent, and compact for 25.1 percent. In 1980, the share of subcompact and compact in the total car market reached more than 50 percent. As a consequence of the two oil shocks, the pattern of consumer demand was changed remarkably. The demand for full-size cars decreased substantially, while the consumer demand for smaller cars, which are more fuel-efficient, rose significantly. The demand for mid-size cars had been relatively stable during that period.

Japanese automakers provided American consumers with the right product, at the right time and the right price, through the right channel of distribution, and with satisfactory after-services. In the 1970s and the early 1980s, American drivers wanted fuel-efficient small vehicles of high quality.

Table II- 3 Passenger Car Trend in the U. S.

Unit: thousand, percentage

	1972	1975	1980	1981	1982	1983	1984
subco-	894	1,160	1,671	1,661	1,739	1,090	1,228
mpact	9.6%	16.4%	25.4%	26.8%	30.2%	16.0%	15.4%
compa-	1,603	1,770	1,675	1,573	1,104	1,838	2,373
ct	17.2%	25.1%	25.5%	25.3%	19.2%	27.0%	29.8%
interm	2,471	2,072	1,836	1,692	1,618	2,167	2,373
ediate	26.5%	29.4%	27.9%	27.3%	28.1%	31.9%	29.8%
full	3,862	1,535	1,075	952	928	974	1,196
size	41.5%	21.8%	16.3%	15.3%	16.1%	14.3%	15.0%
luxury	411	409	322	328	367	726	782
	4.4%	5.8%	4.9%	5.3%	6.4%	10.7%	9.8%
Total	9,317	7,072	6,579	6,206	5,756	6,795	7,952
	100%	100%	100%	100%	100%	100%	100%

Source: Ward's Automotive Yearbook(1971 - 1985)

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While U. S. automakers were not successful in producing this type of car, the Japanese auto firms were very successful in providing such products through innovations and improvement(Chang, 1981: 147).

The Japanese automakers were able to utilize to the golden opportunity afforded by the oil crises. The Japanese auto firms had accumulated technology for producing the small cars which are fuel-efficient. When the oil shocks occurred in the 1970s, the Japanese automakers had competitive advantages over the U. S. counterparts who had little expertise in the production of fuel-efficient small cars. Table II - 4 shows the trend of the Japanese market share in the U. S. market. Since the oil crises, the share of U. S. cars had decreased steadily, while the share of imported cars had increased gradually. In particular, the Japanese share in the imported car sector and the total U. S. auto market had risen remarkably. In 1982, the imported cars accounted for 27. 9 percent in the U. S. auto market, and the Japanese were responsible for more than 80 percent of these imported cars. The Japanese automakers occupied 22.6 percent of the market share in the U. S. auto market in 1982.

The Japanese technical know-how in small car production and the oil crises in the 1970s were fully responsible for the emergence of Japan as an auto giant in the 1980s.

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Table II - 4 The Market Share in U. S. Passenger Car Market

Unit: percentage

	U. S. Made Cars[7]	Imported Cars	Japanese imported Cars
1975	81.8	18.2	9.4
1977	81.5	18.5	12.4
1979	78.2	21.8	16.6
1980	73.3	26.7	21.2
1981	72.7	27.3	21.8
1982	72.1	27.9	22.6
1983	74.0	26.0	20.9
1984	76.5	23.5	18.3
1985	74.3	25.7	20.1
1986	71.7	28.3	20.8
1987	68.9	31.1	21.3
1988	71.5	28.5	19.2
1989	72.4	27.6	19.4
1990	74.2	25.8	18.5

Source: MVMA, Motor Vehicle: Facts and Figure(1976 - 1991)

[7]It includes share of the cars made by Japanese transplant in the U. S.

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However, the potential strength of Japanese automakers resulted from the distinct Japanese production system, which is to be discussed in detail in the next section.

2. New Production Mode

A. Japanese Production System

A New production paradigm, well known as lean production system, was developed by Japan. The Japanese production system turned out to be more efficient and productive than the Fordist system. The Japanese automakers redesigned their manufacturing system, and established new relationships between assemblers and suppliers and between management and workers. These features such as organizational and manufacturing process innovations, best characterize the Japanese production system.

a. Japanese Organizational Innovation

Key elements of the Japanese industrial relations are "Lifetime Employment", "Team Work", and "Enterprise Union". Lifetime employment can be described as "career employment". This practice is much more prevalent among the large companies than among the small companies that employ majority of workers in Japan. Newcomers undergo intensive training and are thereafter expected to work for the company until they retire(Brown, 1987). The Japanese automakers have adopted this practice since the 1950s.[8]

Team work is the most outstanding feature of the Japanese

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[8]"Lifetime employment" emerged as Japanese corporations needed to cope with high rates of labor mobility and to exert more effective control over the labor forces after the World War II(Taira, 1961).

work setting. At Toyota Employees operate in terms of five to ten members. Each team operates on its own and takes full responsibility for production, checking and improving quality standards, training new members, and all other concerns of its work site. Team members share responsibility for team performance and are encouraged to support each other. Shop meetings serve as a convenient channel to ensure communication by inviting the participation of all concerned personnel. These shop meetings work in conjunction with the activities of quality control circles(QC circles), and as such, opinions and observations of rank and file workers are drawn upon in the meetings. The fundamental principle that Toyota follows in solving production problems is to pay maximum attention to solving them by worker-initiated ways and means(Shimokawa, 1986).

Japanese labor union, described as enterprise union, is based on company.[9] Japanese unions have been more willing to forgo short term gains in wage and fringe benefits in the interests and keeping Japanese employers competitive and profitable(Brown, 1987). Japanese unions have access to the best information about the state of corporation. Union members working in such departments as accounting, finance, and corporate planning can certainly tell how much investment outlays the company needs in order to remain competitive or how much wage increase it can really afford. Many union

[9]Also, there are national labor federations in Japan.

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members become managers and top executives(Kawaito, 1990). Japanese union and management have maintained industrial peace through the enterprise union system.

b. Lean Production

In the early era of the post-war, Japanese automakers realized that the Fordist model was not compatible with their situation. The small size of the Japanese car market ruled out the adoption of the Fordist model, which was created for mass production. During the late 1950s and through the sixties and the seventies, the Japanese auto firms strove for an alternative -- lean production, which is characterized as a flexible production mode(Kaplinsky, 1988). The full-fledged launching of the so called just-in-time(JIT) system[10] at Toyota occurred in the 1960s. As motorization in Japan expanded and the requirements of automobile users diversified, it became increasingly necessary to produce small volumes of a large number of body types. In this process of the diversification of models, JIT system demonstrated its formidable potential(Shimokawa, 1986: 238).

With JIT system, Japanese automakers were able to reduce inventories substantially(Kaplinsky, 1988: 458). Consequently, just-in-time system enables automakers to reduce inventory costs. Table II - 5 indicates the trends in inventory turns

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[10]Just-in-time system means that components are produced to order and delivered just in time for the assembly process.

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for U. S. car assemblers and Toyota. Although American Auto firms were making rapid progress in reducing inventories, they remained a long way behind Toyota.

The Japanese lean production system can afford to yield enormous flexibility in manufacturing process. One of the more organizationally complicated aspects of production concerns the use of dies to shape the flat sheet-metal used for body panels. This

Table II - 5 Trends in Inventory Turns for US automakers and Toyota, 1973 - 1984

	'73	'78	'80	'83	'84	'85
Ford	5.3	6.5	9.6	12.2	14.2	16.6
Chrysler	5.6	6.3	6.4	12.6	14.7	19.0
General Motors	5.4	6.7	10.1	11.0	10.3	11.9
American Motors	7.2	6.4	5.8	12.0	15.3	15.5
Toyota				88.6	90.0	

* Inventory turns are one measure of the extent of JIT. It is calculated by dividing the average inventory into total annual turnover. Clearly the higher the number of turns, the smaller the relative level of inventory.

Source: Adapted from Automotive Industries, April, 1986

frequently involves a series of 300 - 500 ton hydraulic presses, through which the pressed sheet passes. Each model of car requires a change of these heavy dies and, in the

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traditional Fordist system which was designed to produce a single shape for a long period time, die-changing was a specialized task and took around eight hours. Similarly the forging and casting of engine parts also involved organizationally complex changes in dies. Table II - 6 illustrates the rapidity and the extent of progress within the Toyota company in Japan and shows how its decision to reduce batch-size(that is, to increase diversity) is linked to the reduction in change-over time. By point of comparison the same process of die-changing in the stamping took two minutes in Mazda and had been brought down from 8 hours to 45 minutes in the U. S. auto firms(Kaplinsky, 1988: 457).

Table II - 6 Shortening of Set-Up Time and Reduction of lot Size in Toyota

Division		'70	'75	'80
Stamping	Set-Up time (Min)	40 - 150	20 - 30	5 - 15
	Lot Size (number of items)	5, 000	1, 500	500
Forging	Set-Up time (Min)	100-200	20-50	10
Casting	Set-Up time(Min)	60	20	4

Source: Kaplinsky, 1988

Japanese lean production has been developed by Japan's

distinct production system, which can be divided into production layers and these interlinked layers make up a production chain among firms. In comparison with American auto firms, Japanese automakers are less vertically integrated. GM internalizes about 70 percent of the value of the auto production process[11], while Toyota does 30 percent. Just-in-time system integrates the production lines of subcontractors with the parent firm, and it promotes spatial concentration as subcontractors locate near the parent. Spatial proximity to the parent especially characterizes the subcontractors who supply: (a) a large percentage of their output to a specific automaker; (b) high value components; or (c) bulky items. Just-in-time delivery in small batches requires close contact between parent and subcontractor; spatial proximity further reduces transportation costs, minimizes possible disruption or delay in delivery, and allows for quick changes in delivery schedules. The higher up the production chain, the more frequent the delivery, and the closer the proximity to the parent company(Hill, 1989b: 469).

Suppliers had to be carefully nurtured to supply just-in-time delivery. In Toyota's case, it produces cars in Toyota City with suppliers located in close proximity, and delivery was made on an hourly basis(Kaplinsky, 1988: 458). Auto suppliers in Japan must accept strict conditions and controls as to price, quality, and delivery and transaction

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[11]Today, this rate of GM is getting low.

regulations. Toyota and Nissan have created a high degree of control over first-layer subcontractors. Many have been converted into partial subsidiaries. Component suppliers become members of Toyota's or Nissan's family of subcontractors(Hill, 1989b: 467 - 8).

JIT system required that suppliers deliver parts and components at a predetermined time and place in pace with the production of automobiles at the assembly plant. The automobile assembler, however, did not oppress parts suppliers with unilateral pressures for inventory reduction. Rather, the first step was for the assembler itself to make efforts to reduce its inventory in the process of production and find out the problems involved. Such efforts only bore fruit after long and time-consuming between management and labor at a great number of meetings and QC circle activities(Shimokawa, 1986: 238 - 9). The Japanese production system can not be implemented without organizational innovations such as quality control circles.

Quality circle activities are voluntary in nature. However, the type of QC activities that are designed for the improvement of operations or work environment are clearly defined as part of normal working operations. The methodology of improvement was clearly clarified and well understood so that both management and labor are able to ensure that no over-strain would occur in the process of improvement and no irrational method would be applied(Shimokawa, 1986: 240).

Also, the enterprise union in Japan plays a great role in keeping industrial peace in the process of improvement of operations. The system of enterprise unionism enables both management and labor to have the same insight on the direction of the corporation. Japanese labor unions are fully aware that no hostility or mutual distrust between management and labor should exist and management pays serious attention to this. A stable relationship between labor and management in the Japanese automobile industry has been achieved in this way and workers have come to perceive the company as being a certain type of community and identify with it strongly(Shimokawa, 1986: 242).

JIT system is maintained only through mutual trust between labor and management. Paternalistic work environment[12] might help Japanese automakers keep the mutual trust in their companies. The key to the Japanese auto industry's competitiveness in the international market is Japanese-style rationalization such as JIT and the cooperative relationship between labor and management. The Japanese superiority lay not in its use of advanced manufacturing technology but in the development and adoption of a new production method(Kaplinsky, 1988).

Womack(1990) compared Toyota Takao plant(lean production system) with GM Framingham plant(traditional production

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[12]Lifetime employment is one of example of a paternalistic work setting in Japan.

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system). In 1987, Takao spent only 16 hours in assembling a car, while Framingham took 31 hours. Takao had a defect rate of 45 per 100, whereas Framingham had 135 per 100. NUMMI(New United Motor Manufacturing, Inc.), which is a joint-venture between GM and Toyota accomplished high efficiency which is close to that of Takao plant. Table II - 7 shows this comparison.

Takao plant was operated by lean production and was almost twice as productive and three times as accurate Framingham in performing the same set of standard activities on the same standard car(Womack et al., 1990: 81). Lean production method enables assemblers to save enormous production costs. The Japanese automakers are able to achieve dramatic advantages in cost competitiveness - as great as $2,000 per model over the Americans -

Table II - 7

General Motors Framingham versus Toyota Takao versus NUMMI Fremont, 1987

	GM Framingham	Toyota Takao	NUMMI
Assembly Hrs per car	31	16	19
Assembly Defects per 100 cars	135	45	45
Assembly Space per Car	8.1	4.8	7.0
Inventories of days Parts(Avg)	2 wks	2 hrs	2

Source: IMVP World Assembly Plant Survey

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while at the same time achieving higher standards of quality and reliability(Tolliday and Zeitlin, 1986: 15).

Both European and American automobile companies began to concentrate great attention on production in order to narrow the Japanese cost advantage and introduce a larger measure of flexibility into the manufacturing process. As a consequence, the gap that the Japanese opened is now being closed by U. S. and Western automakers through a straightforward process of organizational imitation and management reform without a fundamental reconsideration of the tradational production system. Ford concentrates on automation, inventory reduction and quality control(Tolliday and Zeitlin, 1986: 17 - 20). General Motors introduced the Saturn project for the production of the whole new American small car through new production system. GM plans to shut down underutilized plants, consolidate the basic car chasis, and shift work to more flexible, higher volume operations(Treece, 1992). But, it is very hard for U. S. automakers to adopt the JIT approach. In coming to the United States, Japanese carmakers quickly discovered that American parts suppliers could not adapt to just-in-time quality and delivery requirements. Even obtaining basic inputs like high-quality steel or glass proved difficult(Kenney and Florida, 1991). The shortage of qualified parts suppliers and the lack of organizational innovations prevent U. S. auto firms from emulating the Japanese lean production such as the JIT system.

B. New Technology

The new technology such as microelectronics and new materials has diffused rapidly to every sector of the industry. The application of the new technology to the automobile industry is very prominent. The new process technology boosts the development of flexible manufacturing system(FMS). FMS is characterized as the combination of the advantages of craft mode with the most advanced information processing and communication system(Hill, 1989a). Computer Aided Design(CAD), Computer Aided Manufacturing(CAM), Computer Integrated Manufacturing(CIM), and industrial robots are extensively employed in car manufacturing. FMS represents not only a major initiative but a fundamental transition from previous preoccupations with the Fordist mass production system. When operating successfully, this technology will not only offer reduced-product and plant-scale economies, but it will also provide manufacturers with the capacity to both produce for niches in the market and to switch models quickly in response to changing demand, at a much lower changeover cost(Hoffman and Kaplinsky, 1988: 187).

The Japanese auto companies' pioneering use of FMS has allowed them to capitalize on their productive flexibility to speed up the introduction of new models and widen their product range, thus opening up a variety of specialist market

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niches.[13] And by the mid-1980s, their growing financial and productive strength had enabled the Japanese auto firms to close the design gap with Europeans and forced the pace in technical innovation, leaving them poised for competitive superiority across the entire product spectrum(Tolliday and Zeitlin, 1986: 15 - 16).

Although Japanese automakers are ahead of the Americans and Europeans, the automation in the U. S. and the Western assemblers has transformed many of the stamping, welding, painting and machining operations, and is being extended into the assembly of components, subassemblies and the final vehicle. The advantages of CAD are being aggressively explored to reduce the time taken up in the design/engineering/prototype phase and thus to enhance the designer's capability to seek optimum, cost-effective solutions. In the area of computer-based integration between design and production, it appears as if Western European and the United States automakers may be equal to, if not somewhat ahead of the Japanese auto firms(Hoffman and Kaplinsky, 1988: 187 - 188). Fiat, in particular, is considered the car company with the highest world level of robot operations(Volpato, 1986: 218).

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[13]One of the reasons that Japan was successful in adopting the new technology is that the labor union in Japan was willing to accept the new technology because the Japanese firms have never laid workers off due to the introduction of the new production facilities(Toshiro, 1984). Japan, compared to the U. S., has ten times the number of robots on its assembly lines(Kirkland, 1992).

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The Japanese auto firms benefit significantly from flexible manufacturing. At Mazda's Hofu plant, the body line can handle up to 12 different models in variable volumes - a world first, according to Mazda. Productivity at this plant has doubled in the body assembly area compared to a conventional plant. The overall productivity compared to the conventional plant is 25 percent higher(Johnson and Maskery, 1992). Nissan's Kyushu plant, which is equipped with the most advanced machineries, can respond quickly and efficiently to consumer demands. Shifting to the production of a completely new model takes significantly less time at this plant because there is no need to replace the jigs on robots used there. In conventional plants, retooling for production of new model usually requires at least 10 months. But reprogramming software for robots at the Kyushu plant take only three months(Chandler and White, 1992). Through the flexible manufacturing system, the Japanese automakers are able to increase productivity, flexibility, and product quality. In addition, this system enables the auto firms to enhance cost competitiveness. The Japanese competitiveness results from both the lean production system and the extensive application of the new process technology.

3. The Automobile Industry in the NICs

The automobile production of the Latin American and the Asian NICs have been prominent among the third world countries. Mexico, Brazil, South Korea, and Taiwan are the major auto production countries among the NICs. These nations have developed their automobile industry, influenced by transnational automakers. However, the automakers in the Asian NICs have been less dominated by foreign capital than their counterparts of Latin America. Table II - 8 shows the motor vehicle production in these nations.

During the course of the 1970s and 1980s, the automobile industry in Mexico and Brazil became progressively more integrated into the world automobile industry. Export expansion in the Mexican automobile industry has been based upon a component-supplier role characterized by ever-closer relations to the United States, with an emphasis on TNC-made exports of parts and components for incorporation in vehicles built in the TNC's U. S. plants. Brazil, on the other hand, has stressed exports of finished vehicles as well as parts to a variety of international markets, with Brazil playing a regional power role as an export base for foreign companies like Volkswagen and Ford to serve their customers in neighboring Latin American and other developing countries. These different forms of national integration into the global automobile industry are reflected in the fact that the finished vehicles accounted for 58 percent of Brazil's

automotive exports between 1972 and 1982 , while 78 percent of Mexico's automotive exports during the same period were parts and components, particularly

Table II - 8

Motor Vehicle Production, 1965 - 1988(thousands of units)

Year	Mexico	Brazil	S. Korea	Taiwan
1965	97	185	0.1	3
1970	193	416	29	9
1971	211	517	23	20
1972	230	622	19	22
1973	286	750	26	24
1974	351	906	30	29
1975	361	930	36	31
1976	325	987	48	31
1977	281	921	83	44
1978	384	1064	156	77
1979	444	1128	204	116
1980	490	1165	123	133
1981	597	781	134	133
1982	473	859	163	134
1983	285	896	221	158
1984	344	865	265	171
1985	398	967	378	160
1986	341	1056	602	184
1987	395	920	980	224
1988	513	1069	1084	250

(Source: Gereffi, 1990, P.103)

engines and gearboxes(Jenkins, 1987: 210 - 11). In Mexico, five transnational automakers have dominated the production of finished car. They are Chrysler, Ford, General Motors, Nissan, and Volkswagen. In case of Brazil, TNCs such as Volkswagen, General Motors, Ford, Fiat, and Toyota, have been involved in the finished car production(Ward's Automotive Yearbook, 1991: 103). In these nations, the automobile industry, especially the production of complete cars, has been run entirely by

foreign auto TNCs.

In Taiwan, there are eleven automakers, all of which are involved in joint-ventures with foreign makers. Ford Lio Ho is the island's largest; Yue Loong, 25 percent owned by Nissan, is number two. Together, Ford Lio Ho and Yue Loong produce over half of the Taiwanese made vehicles sold in the domestic market(Smith, 1990). Except Ford Lio Ho, which is 70 percent owned by Ford, TNCs have less than 50 percent equity holdings in the other Taiwanese auto firms. Thus, the Taiwanese automobile industry has been run by Taiwan's indigenous capitals. Table II - 9 indicates market share of Taiwanese auto manufacturers. As indicated in the table, the Japanese involvement in Taiwan's automobile industry is very significant. Taiwan has succeeded in establishing an export niche for itself as a supplier of auto parts. Taiwanese TNC subsidiaries now see themselves becoming niche producers for relatively low volumes of expensive models made by skilled workers for sale throughout the world(Johnson, 1992a). However, Taiwan auto firms have made very limited achievements because of the constraints faced by small firms.[14] Without achieving economies of scale[15], they cannot mount major export drives due to the lack of production efficiency(Gereffi, 1990:

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[14]In addition, the Taiwanese automobile industry has suffered from rising labor costs and real estate costs. Taiwan's production costs are second only to Japan in East Asia and far higher than in South Korea(Johnson, 1992a).

[15]In case of the automobile, the production volume for the economies of scale is 30 to 40 thousand units per year.

102, 105).

The real lure of Taiwan is the mainland China market. The People's Republic of China(PRC) has 1.2 billion people with only an estimated 40 - 50,000 privately owned cars, including taxis. Eighty percent of China's current 4.4 million vehicles are trucks and buses. There is a 273:1 people per vehicle ratio, one of the highest in the world(Hill and Lee, 1993). Taiwanese automakers are conducting feasibility studies for mainland joint-ventures. Japanese subsidiaries in Taiwan would like to provide high tech components for PRC made vehicles

Table II - 9

Market Share of Taiwan Auto Manufacturers(unit: percent)

	1987	1988	1989
Yue Loong(Nissan)	32.0	25.0	20.8
Ford Lio Ho	21.6	27.9	31.4
China Motor(Mitsubishi)	11.6	12.5	12.8
San Yang(Honda)	15.0	13.9	12.4
ue Tyan(Daihatsu)	11.7	12.2	11.6
anfu(Renault)	8.1	7.7	5.6
o Ziu(Toyota)	-	0.8	4.2
inese Auto(Citroen)	-	-	1.1
Ching(Sabru)	-	-	0.1

*Joint-venture partners in parentheses

(Source: Automotive News, June 18, 1990)

and exchange built up Taiwan vehicles for low tech mainland works; like castings, which requires lots of labor, land and raw materials, all of which are scarce in Taiwan. Taiwanese industrialists dream of a China development triangle, made up of Taiwan, Hong Kong and the PRC. Potentially the world's largest market, a China triangle would serve as a counterweight to protectionist trends in the North America and Europe(Hill and Lee, 1993).

In the late 1970s, Korea's automobile industry began to grow rapidly. Hyundai and Kia have already realized economies of scale. In 1990, the Korean automobile industry produced 130 thousand cars(World Motor Vehicle, 1992). Unlike the Taiwan automobile industry, there are only three passenger car companies in the Korean automobile industry. These three car companies belong to their Chaebols(big business conglomerates), which have helped their automobile companies grow fast. Except Daewoo, which was 50 percent owned by General Motors[16], Hyundai and Kia are predominantly run by indigenous capitals. Hyundai allowed Mitsubishi to partially own its company, and Kia allowed Mazda and Ford to partially own its company. However, the foreign equity in these companies is very insignificant. Although Hyundai and Kia have maintained indigenous ownerships, they have been heavily dependent upon their Japanese partners for technology.

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The Korean Big Three have sold their finished vehicles overseas since the mid-1980s. While Kia and Daewoo sell their cars in overseas markets by original equipment manufacturing(OEM)[17], Hyundai exports its cars under its own brand in world markets. By 1988, the Korean automakers sold 500 thousand passenger cars in the United States, accounting for four percent of the total market(Womack et al., 1990: 262).

Table II - 10 summarizes the characteristics of four NICs' auto industry. The automobile industries in Brazil and Mexico, which are dominated by foreign TNCs, have export finished vehicles as well as components and parts. Taiwan's automobile industry, which is run by indigenous capitals, exports components and parts. Korean auto industry, which is domestically funded, has sold the finished cars in the world markets.

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ia's Festiva is sold in the U. S. market under Ford brand, Daewoo's Lemans is under Pontiac badge.

Table II - 10

The Characteristics of the NICs' Auto Industry

Country	Capital Structure	Export
Mexico	dominated by TNCs	finished vehicles and components
Brazil	dominated by TNCs	finished vehicles and components
Taiwan	domestically funded	components
Korea	domestically funded	components and finished vehicles

4. Summary and Conclusions

Ford's mass production system dominated the world automobile industry for more than a half-century. This production paradigm had been adopted in most sectors in North America and Europe. U. S. automakers status as manufacturing giant began to be challenged in the 1970s by the Japanese auto firms' new production system known as lean production. Japanese automakers emerged as auto giants in the 1980s because of the technical know-how in small car production and the oil crises in the 1970s. However, the real strength of Japanese auto firms came from the distinct Japanese production system, which proved to be more efficient and productive than the Fordist system.

The Japanese automakers redesinged their manufacturing system, and established new relationships between assemblers and suppliers and between management and workers. The Japanese lean production, which can yield enormous flexibility in the manufacturing process, is divided into production layers and these interlinked layers make up a production chain among firms. Just-in-time system integrates the production lines of subcontractors with the parent firm, and it promotes spatial concentration as subcontractors locate near the parent.

Japanese production system cannot be implemented without organizational innovations such as quality control circles. The JIT system is maintained only through mutual trust between labor and management. The key to the Japanese auto industry's

competitiveness in world markets is Japanese-style rationalization such as JIT and the cooperative relationship between labor and management. The Japanese superiority lay not in its use of advanced manufacturing technology but in the development and adoption of a new production method.

The new technologies such as CAD, CAM, and CIM are extensively employed in car manufacturing. The Japanese auto companies' pioneering use of the new technologies has allowed them to capitalize on their productive flexibility to speed up the introduction of new models and widen their production range. Through the flexible manufacturing system, the Japanese automakers are able to increase productivity, flexibility, product quality, and cost-competitiveness. The Japanese competitiveness resulted from both the lean production system and the extensive use of new process technology.

Mexico, Brazil, South Korea, and Taiwan are the major auto production countries among the NICs. The automobile industry in Mexico and Brazil became progressively more integrated into the world automobile industry during the course of the 1970s and 1980s. Export expansion in the Mexican automobile industry has been based upon a component-supplier role, while Brazil has stressed exports of finished vehicles as well as parts to a variety of international markets. In these nations, the automobile industry, especially production of complete car, has been run entirely by foreign auto TNCs.

In Taiwan, there are eleven automakers, all of which are

operated in joint-ventures with foreign makers. The Japanese involvement in the Taiwan automobile industry is very significant. Taiwan has succeeded in establishing an export niche for itself as a supplier of auto parts. Taiwan auto firms have made very limited achievements because of the constraints placed on small firms. There are three passenger car companies in South Korea. Hyundai and Kia have maintained indigenous ownerships, while Daewoo has not. The Korean Big Three have sold their finished vehicles overseas since the mid-1980s. While Kia and Daewoo sell their cars in overseas markets by OEM, while Hyundai Motor Company exports its cars under its own brand in world markets.

Chapter III.

The Development of the Korean Automobile Industry

1. The Industrialization Process of South Korea

Korea's industrialization has been affected by the following factors; external dynamics(geopolitical structure), industrial structure, state role, and foreign capitals.

A. External Dynamics

The insertion of South Korea into the world system began with the expansion of the Japanese empire in the late 19th century. Korea was under colonial rule from 1910 to 1945, and her economy was integrated into a regional division of labor centered on Japan(Koo, 1987: 166). By 1945 Korea had an industrial infrastructure that, although sharply skewed toward metropolitan interests, was among the best developed in the third world. It is generally believed that Japanese colonialism in Korea left a substantial foundation of infrastructure on which later industrialization could build. Korea had begun to take on semiperipheral characteristics. Korea's developing periphery was Manchuria, where it sent workers, merchants, soldiers, and bureaucrats. As Korean rice was shipped to Japan, millet was imported from Manchuria to feed Korean peasants(Cumings, 1987: 56). After the World War II, the triangular structure emerged in Northeast Asia:

the United States(core), Japan(semipheriphery), and Korea(periphery). As Japan began to develop an economic hegemony in this region, Japan became a core once again, while South Korea began to play the role of a semiperiphery. Korea's industrialization has followed Japan's through a classical product-cycle industrialization pattern. Japan's industrialization has gone through three phases. The first phase began in the 1880s, with textiles as the leading sector, and lasted through Japan's rise to the world power. In the mid-1930s Japan began the second, heavy industry phase, based on steel, chemicals, armaments, and ultimately automobiles; it did not end until the mid-1960s. The third phase emphasizes high-technology such as electronics, communications, computers and silicon-chip microprocessors. As Japan moves up toward high value-added products, she shifts low value-added products or components to South Korea(Cumings, 1987). In the early 1970s, Japan transferred basic steel production to Pohang Iron and Steel Company(Posco) in South Korea. However, Japan kept the production of high-quality steel, which is high value-added. Through the dynamics of the product life cycle, Posco came to a be a world-class steel producer, which played a vital role in the rapid development of the Korean automobile industry.

Korea's Industrial Structure

In South Korea, local private firms are the main actors.

Nine of the ten largest companies in South Korea are privately held by domestic conglomerates(Chaebols)[18]; the only exception is Pohang Iron and Steel(Posco), a state-owned enterprise that is ranked seventh(for details, see Table III - 1). Each of the private South Korean conglomerates is involved in a wide range of industries and has a staggering number of affiliates(Gereffi, 1990: 95).

There are four leading Chaebols in Korea;(1) Samsung(twenty-seven companies), which produce primarily consumer goods, (2) Hyundai(thirty-seven companies), which concentrates on producers' goods and automobiles, (3) Daewoo(twenty-nine companies), which spread among trade, finance, machinery, electronics, and engineering, (4) Luck Group, which has Bando Trading company, electronics, and oil refinery. Korea's Chaebols are very similar to Japan's zaibatsu[19] except that in the prewar period the zaibatsu groups included their own bank, and in the postwar period rebuilt around their own bank. Korea's Chaebol, on the other hand, must rely on government-controlled credit institutions(Johnson, 1987: 161).

In the case of Latin America, foreign TNCs and state-owned dominate their industrial structure. In Taiwan, the big sses are held by state-owned and local private capitals.

Japan's Zaibatsu is characterized as financial cliques. The es are vertically and horizontally integrated "industrial , usually including their own trading company. After the War II, Zaibatus was dissolved by the Occupation Forces. , Zaibatsu was not eliminated, rather it was zed(Johnson, 1987). The modern industrial group in Japan is Keiretsu.

South Korea's industrial structure is dominated by giant Chaebols. South Korea's top ten firms accounted for 63.5 percent of the country's GDP in 1987, compared to a concentration ratio of 14.7 percent for Mexico, 14.3 percent for Taiwan, and 10.5 percent for Brazil(Gereffi, 1990: 96). Chaebols in South Korea play the role of a locomotive in Korea's economic growth. South Korea's major industries have been led by Chaebols, which are privately and domestically funded.

C. State Role

In East Asian countries, the government is characterized as developmental state. Government, at least in South Korea, is the senior partner in business. However, a great deal of government's involvement is indirect(e. g. government-controlled credit, government regulation of the purchase of raw materials, energy, and foreign exchange, and price controls for selected commodities)(Gereffi, 1990: 97). Korean government planning, target setting, and incentive measures have been "market sustaining" rather than "market repressing"(Johnson, 1987: 140).

Table III - 1 The Big Companies in South Korea

Rank/Company	Main Industry	Ownership
1. Samsung	Electronics	Locally private
2. Luck-Goldstar	Electronics	Locally private
3. Daewoo	Electronics	Locally private
4. Sunkyong	Petroleum	Locally private
5. Ssangyong	Petroleum	Locally private
6. Korea Explosive	Chemicals	Locally private
7. Posco	Iron and Steel	State
8. Hyundai Motor	Motor Vehicles	Locally private
9. Hyosung	Textile	Locally private
10. Hyundai Heavy Industries	Transportation Equipments	Locally private

(Source: Gereffi, 1990, P.94)

In South Korea, the Chaebols are crucially important in implementation of the government's economic policies. This was especially true in the phase of the development of heavy and chemical industry in the 1970s, when the steel, shipbuilding, automobile, petrochemical, and heavy machinery industries were the focus of the government's "big push" approach. This was predicated on an unprecedented concentration of capital in the Chaebol groups(Gereffi, 1990: 7). The huge capital accumulations by the Chaebols became a strong foundation for the development of capital intensive industries such as the automobile, electronics, and semiconductor industries. Korean government policies over the

mid-to-late seventies emphasized the provision of large-scale infrastructure, but new state-owned enterprises were formed in petrochemicals and shipbuilding, as well as steel. The state's role grew over the 1970s in the development of technology and capital intensive industries(Haggard and Cheng, 1987: 123).

Foreign capital is one of the most important factors which contributed to South Korea's rapid industrial development. Especially in the postwar period, huge economic aids and financial assistance from the United States played a vital role in the reconstruction of Korea's economy. The government policies on foreign capital in South Korea are very distinctive. One of the elements of the Japanese model that appears to be contradicted by the Korean case is the degree to which the Japanese have prevented foreign participation in their economy. By contrast, Korea has given virtuoso performances in how to use foreign multinational capital without at the same time becoming subservient to it(Johnson, 1987: 163). During the early postwar period, in South Korea, virtually all investment was financed by foreign savings rather than domestic capitals. In the early 1950s, foreign aid financed 80 percent of investment in South Korea. Concessional capital flows covered 70 percent of imports in South Korea(Cole, 1980).

However, the portion of foreign capital in the investment ecreased substantially(Stallings, 1990: 81). Table III - 2 hows the role of foreign savings and domestic savings in

South Korea. In the 1980s, Korea began to eliminate dependency on foreign capitals in domestic investments.

Table III - 2

The Role of Foreign Savings and Domestic Savings in Korea(percent)

Year	Total Domestic Savings	Foreign Savings
56 - 60	34.8	65. 2
61 - 65	45.8	54. 2
66 - 70	61.0	39. 0
71 - 75	69.1	30. 9
76 - 80	82.9	17. 1
81 - 82	79.4	20. 6
83 - 86	98.1	1. 9

(Source: International Financial Statistics; Economic Statistics Yearbook)

In Korea, the pattern of interaction with foreign capitals is very distinctive. The government has been actively involved in the introduction of foreign capitals. In South Korea, the state's control of domestic financial resources in the period before foreign banks would consider lending to Korean companies was crucial in establishing the state's preeminence. However, the shift to foreign loans extended rather than undercut the state's role. Korean firms wanting foreign loans needed government approval and repayment guarantees. Because access to low-cost foreign loan capital

was a crucial competitive advantage, the Korean state became a principal arbiter of which local capital groups could expand and in which areas they could expand, particularly as large Korean enterprises tend to operate with very high debt-equity ratios(Evans, 1987: 216). Since Korean government allowed local enterprises to introduce foreign capitals by debt, they came to have high debt ratios. However, Korean corporations were able to maintain a dominant equity share. As a consequence, Korean enterprises could hold managerial prerogative despite the involvement of huge foreign capitals.

The Korean state contributed significantly to the maintenance of indigenous ownership and managerial rights over the threats of foreign capitals. The ability of the Korean state to control foreign capital derived from the historical development. In Latin America, bureaucratic authoritarian state apparatuses emerged in societies already thoroughly penetrated by foreign direct investment. In Korea, by contrast, bureaucratic regimes were already in command by the time foreign investors began to take a real interest(Evans, 1987: 215).

In sum, the Korean state, as a senior partner in business, initiated industrial development, controlling bank credit and foreign borrowing. Also, the Korean government fully protected local businesses from foreign domination. Consequently, Korean enterprises were capable of fostering capital accumulations and maintaining managerial prerogatives.

The industrial development in South Korea has closely followed that of Japan. Korea shares with Japan institutional structures such as business conglomerates(Chaebol and Zaibatsu). Both Japan and Korea have a developmental state which actively initiates national economic development. In the developmental process, like Japan, Korea shifted her concentration from light industries to heavy and chemical industries, and Korea's competitive advantages came from productive cheap labor. Korean enterprises, like Japan's counterparts, have absorbed foreign technology extensively. Korea has imported a great deal of manufacturing technology and efficient production techniques from Japan(Amsden, 1989). Table III - 3 summarizes the comparison between Japan's industrial development and Korea's.

Korea has followed Japan's developmental track through the hierarchy of the product life cycle. Although Korea has copied institutional structure and business strategy from Japan, Korea has remained behind Japan because of the external dynamics. Once Japan moves upward, Korea begins to take Japan's secondhand technologies and old models by the product cycle dynamics.

Table III - 3

The Comparison between Japan's Industrial Development and Korea's

	Japan	Korea
State Role	Developmental State	Developmental State
Industrial Structure	Keiretsu(Zaibatsu) that has its own bank	Chaebol that hasn't its own bank
Foreign Capital	Insignificant	Allowed with Restriction
Indigenous Managerial Right	Yes	Yes
Developmental Pattern	From Light Industries to Heavy Ones	The Same Trend
Technolgical Development	Relying on Foreign Technologies extensively	Importing Tech From Japan

2. The History of the Korean Automobile Industry and the State Policy

The history of the Korean automobile industry is divided into three stages, according to the technological capability of the Korean automakers; the Simple Assembly Stage(1962 - 1973), the Manufacturing Stage(1974 - 1981), and the Mass Production Stage (1982 - Present).

A. The Simple Assembly Stage(1962 - 1973)

In the mid-1950s, the Korean automobile industry originated by producing civilian motor vehicles from rebuilding U. S. military jeeps. These vehicles were made by craft mode with out-of-date equipments(Global Business Consulting, 1987).

South Korea began to manufacture vehicles by knock-down in the early 1960s. Sae-Na-Ra Motor Company[20] produced Blue Bird by assembling Nissan's components in 1962. The Korean government enacted "the Automobile Industry Protection Act" in May, 1962. The act was passed in order to boost the import substitution of the automobile industry and limit the entry of new automakers.[21] Through the act, the government intended to

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[20]This company became Daewoo Motor Company later.

[21]In the case of Japan, the state enacted "the Automobile Manufacturing Law" in order to protect its automobile industry in 1935. After the World War II, the Japanese government had supported the automobile industry extensively. The Ministry of International Trade and Industry(MITI) developed the protective measures such as tariffs, a commodity tax, restrictions on imports, and restrictions

increase local content rate, and to protect the Korean automakers from severe competition. As a result of the act, the automobile production in Korea was monopolized by Shin-Jin Motor Company, which bought Sae-Na-Ra Motor Company, until the act was annulled in 1968. The new automakers, which are Hyundai Motor Company and Asia Motors, entered the automobile industry(Korean Automobile Manufacturers Association, 1983). Since then, the Korean automobile industry was under an oligopoly by Shin-Jin, Hyundai, and Asia. Hyundai manufactured "Cortina" by CKD(Completely Knocked Down) from Ford components, while Asia Motors manufactured Fiat 124 by the same process. Shin-Jin had introduced Toyota models, and in 1972, it switched to General Motors[22] Table III - 4 shows the production trend of the passenger car in this period. Shin-Jin Motor Company was leading the industry, while Hyundai was following Shin-Jin, closing the gap. After the relationship between Hyundai and Ford was broken[23], Hyundai began to pursue an independent strategy, which contributed to the successful launch of its own model -- Pony. Asia Motors was sold to Kia Motor Company, and became a subsidiary of Kia in 1976[24]. Since

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on foreign capital in the 1950s(Genther, 1990).

[22]In 1972, Shin-Jin Motor Company made a joint-venture with General Motors. The company name was changed to GM-Korea.

[23]At this time, transnational auto firms such as Fiat and Ford were not interested in the Korean market because the Chinese market was more attractive to them.

[24]After the relationship with Fiat was broken, Asia Motors suffered from the financial loss.

then, Asia Motors has produced commercial vehicles(Korean Automobile Manufacturers Association, 1983).

Table III - 4 The Production of Passenger Cars(1969 - 73)

Year	1970	1971	1972	1973
Shin-Jin	10,394	7,161	5,606	6,696
Hyundai	2,398	2,398	2,165	5,426
Asia	1,737	2,869	1,731	486
Total	14,487	12,428	9,952	12,611

(Source: The History of Hyundai Motor Company, 1987)

B. The Manufacturing Stage(1974 - 1981)

In the 1970s, the Korean government shifted its focus from light industries to heavy and chemical industries. The world-class steel production by Posco, which is a state-owned company, is one example of the remarkable industrial development in South Korea. In this period, the automobile industry was not a strategic industry yet. However, the rapid progress of the heavy and chemical industries became the strong foundation for the development of the automobile industry. The steel supply by Posco allowed the Korean automakers to save material costs significantly.[25]

In 1974, the Ministry of Trade and Industry announced

[25]Korean auto firms could save 30 percent of material costs by purchasing steel from Posco, compared with the import of the steel from abroad(Bank of Korea, 1986).

"Long Term Development Program for Automobile Industry".[26] This program was prepared in order to encourage Korean automakers to reach economies of scale through mass production.[27] The Korean government boosted the production of domestic model like Hyundai's Pony. The contents of the program are as follows.

First, the Korean automakers must achieve mass production scale(50 thousand units per year), increase the local content rate to 95 percent by 1975, and export cars with total value up to $150 million per year by 1981.

Second, the automakers are to build the plants for engine and body.

Third, the part or component suppliers must achieve mass production scale by concentrating on one component or part.

Fourth, the Korean government affords the automobile industry tax credits and bank credits in order to support the above projects.

According to this program, the three Korean automakers(GM-Korea, Hyundai, and Kia) began to manufacture

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[26]Japan, like Korea, had some developmental measures for its automobile industry in the 1950s. Its automobile industy was supported by the "Enterprises Rationalization Promotion Law". The Japanese government set perimeters limiting what companies enter into technology ties up and what type of cars could be produced(small not large), provided foreign capital, and enacted generic measures from which the automobile industry benefited(Genther, 1990: 91).

[27]The Korean government restricted entry into the automobile industry so that the existing auto firms might achieve the economies of scale by mass production.

small passenger cars(Ministry of Trade and Industry, 1974). Hyundai produced "Pony" with technical assistance from Mitsubishi Motor Company.[28] Kia manufactured "Brisa", which was developed based on the old Mazda model. GM-Korea produced "Camina" by remodelling Chevrolet 1700. As a result of "Long Term Development Program for Automobile Industry", the automobile production in South Korea rose up to 112,314 units in 1979. Table III - 5 shows the trend of production by three Korean passenger car companies. Hyundai increased its production capacity rapidly, and it came to be the industry leader in 1976. Table III - 6 indicates the domestic market

Table III - 5 Passenger Car Production in South Korea

Year	Hyundai	Kia	GM-Korea	Total
1970	2,356	1,737	9,575	13,668
1975	4,722	10,202	2,559	17,483
1976	14,826	6,991	3,788	25,605
1977	27,466	10,548	4,270	42,824
1978	57,054	16,477	12,162	85,693
1979	71,744	22,140	18,483	112,314
1980	39,701	8,725	7,500	55,926

(Source: Hyundai Motor Company, 1990)

[28]Hyundai's Pony was designed by Italian designer Giorgetto Giugiaro. Its major components such as engine and transmission were produced under the license of Mitsubishi Motor Company. Although Hyundai's Pony was the first Korean car model, it was manufactured based upon old Mitsubishi models.

share of three Korean passenger car companies. The predominant position of GM-Korea was broken by the challenge of Hyundai. Hyundai's market share increased continuously, while that of Kia and GM kept decreasing.

Table III - 6 The Domestic Market Share(unit: percent)

Year	Hyundai	Kia	GM-Korea	Total
1970	18.4	8.5	73.1	100
1975	28.3	56.4	15.3	100
1976	57.0	28.1	14.8	100
1977	61.2	26.5	12.3	100
1978	62.7	21.7	15.6	100
1979	59.9	21.7	18.4	100
1980	66.4	18.5	15.1	100

(Source: Hyundai Motor Company, 1990)

"The Long Term Development Program for Automobile Industry" made the Korean auto firms improve local content rate. In the late 1970s, the local content rate reached 90 percent except for GM-Korea. Table III. - 7 shows the improvement of local content rate in the Korean automobile industry. "The Long Term Development Program for Automobile Industry" encouraged Korean auto firms to export their cars. As a consequence, they began to sell automobiles overseas. In February 1976, Hyundai exported five units of Pony to Ecuador. Since then, Hyundai had sold Pony to the Middle East and

Central America(Hyundai, 1987). In this period, the Korean

Table III - 7 Local Content Rate of the Korean Automakers

	1976	1977	1978	1979	1980
Hyundai Pony	90%	90%	91%	92%	93%
Kia's Brisa	78%	89%	89%	89%	92%
GM-Korea's Gemini		70%	75%	82%	85%

(Source: KIET, 1982)

automobiles were exported through the dumping. Since the Korean auto firms had not realized the economies of scale yet, they could not reduce the price by minimizing production costs. They had to suffer losses due to the dumping. However, the Korean government compensated the Korean automakers with export subsidies and tax credits(Korean Automobile Manufacturers Association, 1980; Wade, 1990: 251). Table III - 8 shows export prices and the losses of Korean auto firms.

Table III - 8 Export Prices of Korean Passenger Cars(1980)

	Pony	Kia's Brisa	GM-Korea's Gemini
Domestic Price	$3, 017	$2, 631	$2,975
Export Price	$1, 303	$1, 121	$1, 455
Loss	$1, 714	$1, 510	$1, 520

(Source: Korea Auto Industries Coop. Association, 1980)

C. The Mass Production Stage(1982 - Present)

In 1981, the Ministry of Trade and Industry announced "The Auto Industry Rationalization Program". The program mandated that Hyundai and Daewoo could not produce light trucks. Kia was given a monopoly on light trucks and buses and was to take Asia Motor, a producer of large trucks and buses, under its wing. The Korean government pushed Kia out of the passenger car industry for five years. Thus, Hyundai and Daewoo[29] remained in the passenger car market until 1987. The Rationalization Program was lifted as of Jan. 1, 1987; Hyundai, Kia, and Daewoo were allowed to produce both passenger cars and light trucks. However, the Korean government wanted these companies to build their strength and international competitiveness, thus all other Korean companies were excluded from entering the automobile industry until 1989(Global Business Consulting, 1987: 1). Through the Rationalized Program, the Korean government enabled the Korean automakers to realize the economies of scale by limiting the number of passenger car companies.[30] This program contributed

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[29]Daewoo bought 50 percent share of GM-Korea in 1978, and the name was changed to Daewoo Motor Company in 1983. Daewoo Motor Company was still 50 percent owned by General Motors.

[30]The Japanese government had "Reorganization Plans" which are similar to "the Auto Industry Rationalization Program" in Korea. MITI felt that the auto industry could be strengthened through reorganization to eliminate excessive competition. It advocated "the Three Group Concept", which was designed to limit the number of manufacturers of passenger cars - excessive competition - in order to stimulate the mass production thought to be crucial to competitiveness. The three proposed groups were: two conventional passenger car companies(Toyota and Nissan), two or three specialty

to the improvement of international competitiveness of Korean auto firms through the minimized production costs due to the economies of scale. Hyundai realized the economies of scale[31] in the mid 1980s. Kia and Daewoo were moving toward the economies of scale in the late 1980s. Table III -9 shows the trend of passenger car production of the Korean Big Three.

Table III - 9 Passenger Car Production in the 80s

	Hyundai	Kia	Daewoo
1981	52,926	4,753	-
1983	93,015	136	27,406
1985	225,970	-	36,805
1986	408,177	26	47,802
1987	544,648	95,532	149,639
1988	584,349	133,602	147,744
1989	525,857	182,332	147,944
1990	557,683	225,125	184,749

(Source: World Motor Vehicle Data, 1982 - 1991)

In the early 1980s, Hyundai and Daewoo remained in the

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car producers(high quality, minidiesels, sport), and two or three minicar producers. However, MITI failed to win business support because of the MITI's underestimation of the competitiveness and dynamism of the Japanese automobile industry(Genther, 1990: 135).

[31]The economies of scale for an automobile plant is approximately 30 thousand units per year.

passenger car industry by the Rationalization Program. As a consequence, Hyundai was able to expand its production capacity very rapidly in the early 1980s. Hyundai's production capacity increased up to more than four times between 1981 and 1985(See table III - 9). In the 1980s, Hyundai's domestic market share for passenger car kept increasing, while Daewoo's share decreased gradually. In 1981, the market share for Hyundai was 77.0 percent. In 1986, it rose up to 89.2 percent. Hyundai came to have absolutely dominant domestic market share. Table III - 10 shows the trend of the domestic market share for the Korean passenger car companies.

Table III - 10

Domestic Market Share for the Korean Passenger Car Companies

Year	Hyundai	Daewoo	Kia	Other*
1981	77.0%	12.9%	6.9%	3.1%
1982	82.6%	15.7%	0.6%	1.1%
1983	76.2%	22.5%	-	1.2%
1984	77.7%	21.4%	-	1.0%
1985	85.4%	13.9%	-	0.6%
1986	89.2%	10.3%	-	0.5%

* Other means jeep producers

(Source: Global Business Consulting, 1987)

In this period, the Korean government boosted domestic demand for passenger cars in order to help the Korean auto

firms achieve economies of scale. The Ministry of Trade and Industry reduced taxes for the purchase of passenger cars substantially(KIET, 1982). In fact, the Korean government had imposed a heavy tax on the purchase of passenger cars.[32] The tax cut for car purchasing contributed to the growth of domestic demand for passenger cars, supporting the expansion of production capacity of Hyundai and Daewoo.

In the case of South Korea, the state involvement in the automobile industry has been very successful. By limiting the number of automakers in the industry, the Korean government enabled the existing auto firms to realize economies of scale earlier than auto firms in other developing countries. The Korean state, as a senior partner in the automotive business, set up the developmental plan for the automobile industry, and guided the Korean auto firms. However, in some cases, the Korean automakers resisted the government's policies.[33] Hyundai Motor Company blocked a state-sponsored merger between Hyundai and GM-Korean in 1980. General Motors wanted South Korea to be one site for production of GM's world cars while

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[32]The tax rate for the car purchase in South Korea was more than two times that of advanced nations.

[33]The Japanese government, like its Korean counterpart, tried to induce mergers for its automobile industry. This policy grew out of the three group concept. Financial aid was the major tool the government possessed to encourage mergers. This attempt of the Japanese government failed because of economic pressures and the strong separate identities of the companies involved. The government supported the concept of mergers but provided few incentives and did not have enough persuasive power to overcome the disincentives present(Genther, 1990).

Hyundai was adamant on continuing to produce a Korean car for domestic and export market. The Korean government viewed the merger as an opportunity to make South Korea a major production site for auto TNCs. Hyundai blocked this plan by demanding complete control over vehicle design and manufacture. Hyundai wanted to maintain Japanese production methods, which were more efficient than those proposed by General Motors.[34] Hyundai's resistance to state pressure for a merger with GM-Korea was also bolstered by the firm's ability to draw on funds within the broader Hyundai Chaebol(Doner, 1991: 16 - 17).

The Korean automobile industry followed the developmental track of its Japanese counterpart. In the simple assembly stage(1962 - 1973), the Korean government enacted the Automobile Industry Protection Act designed to boost the import substitution and limit the entry of new automakers. In the case of the Japanese automobile industry, the Japanese government passed a similar law to protect the Japanese automobile industry in 1935. Korea's Ministry of Trade and Industry announced the Long Term Development Program in the manufacturing stage(1974 - 1981). It was prepared to encourage Korean automakers to reach economies of scale through mass

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[34]This event represents the conflict between the powerful business(Hyundai) and the developmental state(Korean government). Interestingly, this conflict contributed significantly to the development of the Korean automobile industry. The role of the big business in Korea and Japan is important as much as that of the state.

production. Japan had similar developmental measures for its automobile industry in the 1950s. In the mass production stage(1982 - present), Korea's Ministry of Trade and Industry announced the Auto Industry Rationalization Program in order that the Korean auto firms realize economies of scale. In the 1960s, the Japanese government had Reorganization Plans which are similar to Korea's Auto Industry Rationalization Program. The Korean automobile industry seems to emulate the development of the Japanese automobile industry.[35]

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[35]It is believed that the Korean policy makers for the automobile industry reviewed Japan's developmental plans for the automobile industry.

3. The Capital Formation of Korean Auto Firms

A. Hyundai Motor Company and Hyundai Chaebol

Hyundai Chaebol[36] was founded in 1947, and its major business was construction. In the 1960s, Hyundai Construction Company grew rapidly by participating in Korea's national projects such as the establishment of infrastructure. In the late 1960s and the 1970s, Hyundai Construction Company took over many national construction projects in Vietnam and the Middle East. Hyundai Construction Company was a cash cow for Hyundai Group until the 1970s. Hyundai expanded its business to automobile, shipbuilding, machineries, electronics, and a trading company. Hyundai Group has concentrated on heavy industries.

Table III - 11 shows the scales and business performances of Hyundai, Daewoo, and Kia Chaebols. Hyundai is the biggest in terms of every aspect such as assets, equity, sales, and operating profit. Hyundai and Kia Chaebols made good business performances(positive profit), while Daewoo was in trouble financially(negative profit).

Hyundai group expanded by establishing or purchasing other businesses with internally generated funds.[37] Through

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[36]Korea's Chaebol is different from Japan's Keiretsu as follows. Unlike Keiretsu, Chaebol has no principal bank. Keiretsu has long-lived, intimate relationships among suppliers and customers. Chaebol has no such an organized corporate network.

[37]In the 1970s, the shipbuilding and automobile businesses were funded from the surplus, which was generated from the construction business, which was a cash cow in Hyundai Chaebol at that time.

this process, Hyundai Chaebol acquired 37 companies(Hyundai Institute of Economics and Society, 1990).

Table III - 11 Three Chaebols(1989; unit: 100 million won*)

	Assets	Equity	Sales	Profit
Hyundai	136,638	36,692	198,818	2,499
Daewoo	113,312	29,848	93,918	-204
Kia	30,712	8,355	31,275	588

* 1 dollar = 800 won

(Source: Korea Credit Evaluation Company, 1990)

Table III - 12 shows the structure of Hyundai Chaebol.

Hyundai Motor Company was founded in 1967. By strong financial assistance from Hyundai Chaebol, Hyundai Motor Company grew very rapidly in the 1970s. Hyundai Motor Company became the biggest firm among Hyundai Chaebol in the 1980s(Hyundai Institute of Economics and Society, 1987). Hyundai Motor Company took the role of cash cow instead of Hyundai Construction Company. Table III - 13 indicates business scale and performances of Hyundai Motor Company and other companies in Hyundai Chaebol.

The major stock owners of Hyundai Motor Company are Chung Ju-Young(founder of Hyundai Group), Hyundai Heavy Inc., Hyundai Construction Company, Mitsubishi Corporation, and Mitsubishi Motors. Chung has a share of 6.3 percent; Hyundai

Table III - 12 The Structure of Hyundai Chaebol

Industry	Companies
Construction	Hyundai Construction Company, Hyundai Engineering, five other companies
Shipbuilding and Heavy Industries	Hyundai Heavy Inc., Hyundai Shipbuilding, Hyundai Elevator, seven other companies
Automotive	Hyundai Motor Company, Hyundai Precision, two other companies
Material	InCheon Steel, Korea Aluminum, two other companies
Manufacturing	Hyundai Electronics, Hyundai Petroleum
Finance	Hyundai Securities, three other companies
Trade	Hyundai Trading Company, three other companies
Information	Hyundai-John Brown Engineering and the other one company

(Source: Hyundai Institute of Economics and Society, 1990)

Table III - 13

Business Performances of the Companies in Hyundai Group(1989)

(Unit: 100 million won*)	Asset	Sales	Profit
Hyundai Motors	35,572	38,065	865
Hyundai Construction	21,885	13,723	414
Hyundai Heavy Inc.	14,921	9,789	111
Hyundai Precision	6,701	6,768	200
InCheon Steel	5,643	5,004	289

*1 dollar = 800 won

(Source: Korea Credit Evaluation Company, 1990)

Heavy has 11.2 percent; Hyundai Construction Company owns 5.6 percent of Hyundai Motor Company. Thus, Hyundai Group has 23.1 percent share of Hyundai Motor Company. Mitsubishi Motors and Mitsubishi Corporation have 6.3 percent share of Hyundai Motor Company respectively. However, they have no voting rights in the decision-making(Korea Credit Evaluation Company, 1990). Table III - 14 shows major share holders of Hyundai Motor Company.

Table III - 14

Major Share Holders of Hyundai Motor Company(1989)

Hyundai Group		Mitsubishi Group	
Chung	6.3%	Mitsubishi Corp.	6.3%
Hyundai Heavy	11.2%	Mitsubishi Motors	6.3%
Hyundai Const.	5.6%		
Total	23.1%		12.6%

(Korea Credit Evaluation Company, 1990)

The dominant share holder of Hyundai Motor Company is Hyundai Group. This fact indicates that significant capital was generated from Hyundai group. Since Hyundai Group has a 23.2 percent share of Hyundai Motor Company, Hyundai Group is able to completely control Hyundai Motor Company. Although Mitsubishi owns 12.6 percent of Hyundai Motor Company, Mitsubishi is totally excluded from the managerial decision-

making. Thus, Hyundai Group has maintained complete managerial prerogative in Hyundai Motor Company despite the foreign participation in the equity of Hyundai Motor Company.

B. Daewoo Motor Company and Daewoo Chaebol

Daewoo Chaebol was established in 1967, its major company was Daewoo Corporation, which is a trading company. Based on this company, Daewoo expanded its business to light and heavy industries. Unlike Hyundai Group, Daewoo was expanded by purchasing existing companies which were in financially trouble. Thus, Daewoo Group had to suffer from huge financial costs which derived from enormous debts of the ailing companies that Daewoo bought. As was seen in Table III - 9, the business performance of Daewoo Group was in bad shape. This problem resulted from the instable financial structure of Daewoo Group, which carries huge debts(Korea Credit Evaluation Company, 1990). Daewoo Group has 29 companies, and its business scope is more diverse than that of Hyundai Group. Table III - 15 shows the structure of Daewoo Group.

Daewoo Group purchased 50 percent of ownership of GM-Korea in 1978, and the name was changed to Daewoo Motor Company in 1983. GM-Korea's financial condition was very bad, when Daewoo purchased GM-Korea. Thus, Daewoo Motor Company suffered from financial difficulty. Because of the high financial costs, Daewoo Motor Company generated low or negative operating profits. Unlike Hyundai Motor Company,

Daewoo Motor Company is not the largest in its Chaebol. In terms of assets, Daewoo Motor Company is the third largest company within Daewoo Group. Table III - 16 indicates business performances of Daewoo Motor Company and major companies in Daewoo Group. Unlike Hyundai Motor Company, Daewoo Motor Company can not play the role of cash cow. Rather, it was significantly responsible for

Table III - 15 The Structure of Daewoo Group

Industry	Companies(29)
Trade	Daewoo Corporation
Construction	Kyong-Nam Company* and three others
Machinery	Daewoo Heavy Inc.*, Daewoo Precision, and two others
Chemicals	Steel and Chemical, Poong-Kuk Petroleum
Shipbuilding and Aerospace	Daewoo Shipbuilding*, Shin-A Shipbuilding, Daewoo Aerospace
Automotive	Daewoo Motor Company* and two auto suppliers
Electronics	Daewoo Electronics and six others
Finance	Daewoo Securities, and two others
Information	Daewoo Information System and Daewoo Economics Institute

* means that those companies were purchased by Daewoo Group.

(Source: Korea Credit Evaluation Company, 1990)

the whole operating loss of Daewoo Group. Table III - 17 shows the comparison between Hyundai Motor Company and Daewoo Motor

Company with respect to sales and operating profit. While Hyundai Motor Company maintained positive profits, Daewoo Motor Company suffered from poor business performance, although the sales of Daewoo Motor Company kept rising.[38]

Table III - 16

The Performances of Major Companies in Daewoo Group(1989)

(unit: 100 million won*)	Asset	Sales	Operating Profit
Daewoo Corp.	30,840	47,896	2,097
Daewoo Shipbuilding	16,856	4,327	-2,387
Daewoo Motor Co.	15,366	11,413	-157
Daewoo Electronics	13,814	12,009	180
Daewoo Heavy Inc.	10,810	7,613	77
Kyong-Nam Company	8,667	1.268	-21
Daewoo Communications	2,841	2,103	85
Daewoo Precision	2,229	752	32

* 1 dollar = 800 won

(Source: Korea Credit Evaluation Company, 1990)

Daewoo Motor Company had been owned by General Motors(50 percent) and Daewoo Corporation(50 percent) until the joint-venture was broken in 1992.[39] Daewoo Corporation is 12. 2 percent owned by Kim Woo-Jung, who is a founder of Daewoo

[38]The bad performance of Daewoo Motor Company resulted from the disharmony between GM and Daewoo as well as the high financial costs. This problem is to be analyzed precisely in Chapter IV.

[39]In 1992, Daewoo Corporation bought GM's equity, and Daewoo is scheduled to make a joint-venture with Honda.

Group. Figure III - 1 shows the equity structure of Daewoo Motor Company.

Table III - 17(unit: billion won)

The Comparison Between Daewoo Motors and Hyundai Motors

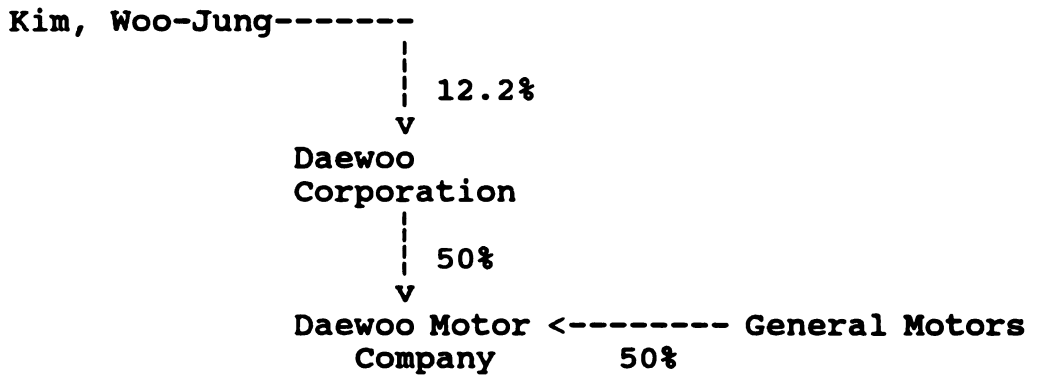
	Hyundai		Daewoo	
	Sale	profit	sale	Profit
1986	1,906	38	198	0.7
1987	2,840	60	961	-5.0
1988	3,411	42	1,049	-10

* 1 dollar = 800 won

(Source: Korea Auto Industries Coop. Association, 1992)

Figure III - 1

The Equity Structure of Daewoo Motor Company(1980s)



(Source: Korea Credit Evaluation Company, 1990)

In contrast to Hyundai Motor Company, Daewoo Group could not control Daewoo Motor Company entirely because General Motors had 50 percent share of Daewoo Motor Company. Unlike

the case of Hyundai, Daewoo Corporation was not able to possess managerial prerogative for Daewoo Motor Company since General Motors had equal rights on the managerial decision-making of Daewoo Motor Company.[40]

C. Kia Motor Company and Kia Chaebol

Kia Chaebol was founded in 1947, and it has been involved in auto-related business such as passenger car, motor cycle, and commercial vehicles. Kia Chaebol attempted to expand its business to non-auto sector in the late 1980s. However, unlike Hyundai and Daewoo, Kia has concentrated heavily on auto-related business(Kia Motor Company, 1989). Therefore, Kia Group is more risky than Hyundai and Daewoo Group when faced with stagnant demand for automobile.[41]

Kia Motor Company has 43 percent share of Asia Motors, which is Kia' subsidiary that produces commercial vehicles such as buses and trucks. Kia Motor Company also owns 90. 1 percent of Kia Machinery, and 53 percent of Kia Auto Supplier. Kia Motor Company has complete control over companies within Kia Chaebol. Figure III - 2 shows the equity structure of Kia Group. Although Kia Motor Company holds

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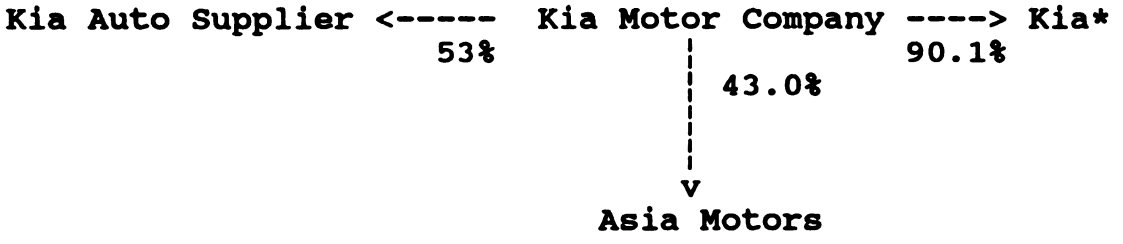
[40]Although Daewoo Corporation had equal footing with GM in terms of equity, GM had more bargaining power(For more details, see Chapter IV).

[41]Hyundai and Daewoo have diverse businesses. Thus they will be better off than Kia Group if automobile business is in trouble.

Figure III - 2

The Equity Structure of Kia Group



*It means Kia Machinery.

(Source: Korea Credit Evaluation Company, 1990)

a significant share of the companies within Kia Chaebol, Kia Motor Company has no dominant stock holders. The equity share for Kia Motor Company is dispersed significantly(Kia Motor Company, 1989).[42] Kia Motor Company has been controlled by professional managers since 1980, thus making Kia one of the first companies to divorce management from capital(Gadacz, 1991).[43]

Ford Motor Company owns 10 percent of Kia Motor Company. Mazda has 8 percent share of Kia Motor Company. C. Itoh & Co.(a major Japanese trading company) owns 2 percent of Kia Motor Company(Berger, 1990: 17). Twenty percent share of Kia

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[42]The son of the founder of Kia group owns only 3 percent share of Kia Motor Company. He is not a significant share holder of Kia Motor Company. Thus, he cannot hold compete control over Kia Motor Company.

[43]The son of the founder of Kia Group gave up managerial control in 1980 due to the bad business performance of Kia Motor Company. He delivered the managerial right of Kia Motor Company to the professional managers.

Motor Company is owned by foreign companies. However, there are no significant foreign share holders.[44] Therefore, the managerial prerogative of Kia Motor Company has never been threatened by foreign capitals.

Kia Motor Company was making good business performance in the 1980s. The sales and operating profit continued to rise. Table III - 18 shows the performance of Kia Motor Company in the late 1980s. Kia returned to the passenger car business in 1987, and it began to surpass Daewoo Motor Company in terms of production capacity, sales, and operating profit.

Table III - 18

The Business Performance of Kia Motor Company

	86	87	88
Sales	642, 349	1, 052, 996	1, 420, 479
Profit	19, 525	20, 557	23, 578

* 1 dollar = 800 won

(Source: Korean Auto Industries Coop. Association, 1992)

In sum, Hyundai Motor Company and Kia Motor Company have maintained indigenous ownership and managerial prerogative, while Daewoo Motor Company has not. Table III - 19 shows the

[44]In South Korea, unlike in the U. S. and Europe, if and only if one has more than 20 percent of stock of a company, he can be considered as a significant shareholder. Usually, the founder and his family of a Chaebol in Korea own more than 20 percent of their Chaebol's businesses, and hold complete control over their businesses. The ownership that is less than twenty percent is insignificant in the Korean business environment.

comparison among three Korean passenger car companies in terms of equity, managerial rights, and business performance.

Table III - 19

The Comparison among the Korean Big Three

	Hyundai	Kia	Daewoo
Equity	Hyundai Chaebol' domination	dispersed	GM and Daewoo
Foreign Ownership	insignificant	insignificant	significant
Managerial Prerogative	Hyundai Chaebol	Professional Managers	GM and Daewoo
Performance	Good	Good	Bad

4. Summary and Conclusions

Korea's industrialization has been affected by the distinctive geopolitical structure, its industrial structure, the state role, and foreign capitals. Chaebols in South Korea serve as a locomotive in Korea's economic growth. South Korea's major industries have been led by Chaebols, which are privately and domestically owned. The Korean state, as a senior partner in business, initiated industrial development by controlling bank credit and foreign borrowing. Foreign capital is one of the most important factors which contributed to South Korea's rapid industrial development. Especially, in the postwar period, huge economic aids and financial assistance from the United States played a vital role in the reconstruction of Korea's economy. Korea has given virtuoso performances in how to use foreign multinational capital without at the same time becoming subservient to it.

The Korean automobile industry has passed through three stages which are the simple assembly stage(1962 - 1973), the manufacturing stage(1974 - 1981), and mass production stage(1982 - present). The Korea automobile industry seems to emulate the developmental process of its Japanese counterpart. Like the Japanese government, the Korean state has initiated the development of the automobile industry. It enacted Automobile Industry Protection Act, and ran the Long Term Development program and the Auto Industry Rationalization Program. Through these measures, the Korean government

protected Korean auto firms, boosted import substitution and helped them realize economies of scale. The Korean government played a decisive role in developing Korean automakers into the world-class producers.

Hyundai Motor Company was founded by Hyundai Group in 1967. Hyundai Motor Company became the biggest firm among the Hyundai Chaebol in the 1980s. The dominant shareholder of Hyundai Motor Company is Hyundai Group. Mitsubishi and Mitsubishi Motor Company partially owns Hyundai Motor Company. However, they have no voting rights in the decision-making. Thus, Hyundai Group has maintained indigenous ownership and complete managerial prerogative for Hyundai Motor Company.

Daewoo Group purchased 50 percent of ownership of GM-Korea in 1978, and the name was changed to Daewoo Motor Company in 1983. Daewoo Motor Company had been owned by General Motors(50 percent) and Daewoo Corporation(50 percent) until the joint-venture was broken in 1992. In contrast to Hyundai Motor Company, Daewoo Group could not control Daewoo Motor Company entirely because General Motors had a 50 percent share of Daewoo Motor Company. Daewoo Corporation failed to possess managerial prerogative for Daewoo Motor Company because General Motors had equal rights on the managerial decision-making of Daewoo Motor Company.

Kia, which belongs to Kia Group, has no dominant stock holders. The equity share for Kia Motor Company is dispersed significantly. Kia Motor Company has been controlled by

professional managers since 1980. Twenty percent share of Kia Motor Company is owned by foreign companies. However, there are no significant foreign share holders. Thus, the managerial prerogative of Kia Motor Company has never been threatened by foreign capitals.

Hyundai Motor Company and Kia Motor Company have maintained indegenous ownership and managerial prerogative, while Daewoo Motor Company has not.

Chapter IV.

The Internationalization of the Korean Automobile Industry

1. The Dynamics of the World Automobile Industry

Until the 1970s, transnational automakers had not been interested in Korean automakers. Ford and Fiat, which had once maintained alliances with Korean auto firms, left South Korea after the relationships were broken in the early 1970s. At that time, South Korea was not attractive to the auto TNCs because Korean automakers were not capable of possessing high production capacity, high labor productivity, and modernized equipment. Auto TNCs were more interested in the Chinese market which, they thought, possessed a large potential demand. In this period, Korean auto firms eagerly attempted to make alliances with foreign TNCs in order to strengthen their competitiveness in the domestic market. But the TNCs showed much less reciprocal interest in the relationship.

In the early 1980s, auto TNCs began to be more interested in

Korean automakers as international partners. The change of the world automobile industry and the improvement of the Korean auto firms made South Korea a more attractive production spot to the auto TNCs.

Since the 1970s, the ascendency of the Japanese auto firms as the world-class automakers had threaten the

predominant position of the U. S. automobile industry. The Japanese automakers, coupled with the efficient production system and the golden opportunity of the Oil Shocks in the 1970s, surpassed the U. S. auto firms in the early 1980s.[45] Responding to the Japanese threats, the United States forced Japanese automakers to accept the export quota, well known as "the voluntary export restraint agreement(VAR)". U. S. automakers also attempted to make alliances with Japanese automakers in order to reduce manufacturing costs of small cars.[46]

The world car strategy was implemented by U. S. Big Three to lower the expenses of design and engineering, realize economies of scale, and enhance manufacturing flexibility by allowing the auto giants to multiply their production locations for various kinds of components.[47] The world car would likely shift standardized production facilities to the less industrialized countries as manufacturers sought lower wages to reduce costs(Hill and Lee, 1993: 12). In this context, Korean automakers(Daewoo and Kia) were chosen by General Motors and Ford Motor Company as sourcing agents of

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[45]For more details, please see Chapter II and Table II - 2.

[46]U. S. Big Three have received major components for small cars from Isuzu(GM), Mazda(Ford), and Mitsubishi(Chrysler).

[47]A world car means a small, energy efficient vehicle with standardized, interchangeable components, designed to be manufactured and marketed throughout the world.

small cars.[48] Mitsubishi Motor Company has had ties with Hyundai Motor Company, which supplies 265 different parts and completed cars[49] to Mitsubishi Motor Company.

The intense competition between U. S. automakers and Japanese counterparts forced them to utilize South Korea as the low-cost production spot. The enhanced production capacity and technological capability of the Korean auto firms attracted foreign auto TNCs.[50] In addition, the low labor wage and high labor productivity of the Korean auto workers and the favorable domestic economic conditions made the Korean automakers attractive to the foreign TNCs. In 1982, the relative productivity index of the Korean automobile industry was 0.90 as compared to 1.4 in Japan and 1.0 in the United States(Economist Intelligence Unit, 1983). Table IV - 1 shows the wage and productivity in the world automobile industry. Relative wage is more meaningful than wage because relative wage also considers productivity. Low wage does not reduce production costs if productivity is low. However, low relative wage can contribute to the reduction of production costs.

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[48]Daewoo has sold Pontiac LeMans to General Motors, and Kia has supplied Ford Festiva to Ford Motor Company since 1987.

[49]In 1987, Mitsubishi Motor Company concluded an eight year agreement to purchase 30, 000 small cars(Hyundai Excel) to be marketed in the U. S. by Mitsubishi Motor Company's American dealers, under the name Precis(Global Business Consulting, 1987: 29).

[50]The production capacity of Korean automakers improved substantially in the 1980s(For more details, please see Chapter III). The technological development of the Korean automobile industry will be explained in Chapter V.

Table IV - 1

The Wage and Productivity in the Automobile Industry(1982)

Country	Wage per hour	Productivity Index	Relative Wage
USA	$ 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: Economic Intelligence Unit, 1983)

As evidenced in Table VI - 1, the relative wage of South Korea was the lowest in the world. The low wage of the Korean auto workers in the early 1980s, was a significant factor, which could decrease the production costs substantially. In the 1980s, the Korean economy enjoyed three favorable economic factors; low interest rate, low oil price, and low exchange rate(Economic Planning Board, 1988). Through the low interest rate, the Korean auto firms were able to save financial costs, thus reducing production costs. The low oil price also contributed to the reduction of the production costs. The low exchange rate allowed the Korean automakers to reduce export prices.[51]

[51]The low exchange rate does not contribute to the reduction of production costs directly. However, the Korean auto firm were able to reduce export price due to the low exchange rate. Thus, foreign partners of the Korean automakers could buy the Korean automobile by cheaper price.

In sum, the external and internal dynamics boosted Korean automakers' involvement in the international division of labor. The severe competition between the Japanese automakers and their American counterparts, the low labor costs of Korean auto workers, and three favorable economic factors in Korea resulted in the international division of labor between Korean automakers and foreign auto TNCs.

2. The Korean Automakers and the Int'l Div. of Labor

A. Hyundai Motor Company and Mitsubishi Motor Company

Since the dissolution of its partnership with Ford in 1972, Hyundai opted for a more independent path. From 1974 through 1976 Hyundai acquired the manufacturing process technique and technologies for power train components from Japan, internal combustion systems from England, and car design from Italy(Amsden and Kim, 1985). Hyundai's collaboration with Mitsubishi followed a careful process of shopping around in which Hyundai first rejected offers from Volkswagen, Renault, and Ford. Mitsubishi offered lower royalty payments and was the only TNC not to demand managerial participation in Hyundai. This allowed Hyundai Motor Company to reserve managerial rights despite Mitsubishi's equity participation(Doner, 1992: 418).

In the late 1970s, Hyundai attempted to collaborate with Volkswagen, which was trying to find a partner in order to cope with the Japanese threats. Although Volkswagen proposed low rate of royalty, it intended to be involved in the managerial activities. The offers of Renault and Ford were rejected by Hyundai because they wanted to participate in managerial control. In 1981, Hyundai Motor Company made an alliance with Mitsubishi Motor Company under the condition that Mitsubishi participates in Hyundai's equity with no managerial rights(Hyundai Motor Company, 1987: 436 - 439). In this process, Hyundai Motor Company succeeded in maintaining

managerial prerogative, while participating in the international division of labor, allowing its partner to take part in its equity.[52] Hyundai's reservation of the managerial rights resulted from its independent strategy. In the early 1980s, Hyundai strongly resisted the Korean government's sponsored merger between Hyundai and GM-Korea.[53] Hyundai's own effort to maintain independent status contributed to the maintenance of Hyundai's indigenous ownership and managerial prerogative. Additionally, the strong bargaining power of Hyundai Motor Company played an important role in sustaining its independent status. This bargaining power is reinforced by Hyundai's ability to draw on abundant funds from the huge financial resources of its Chaebol(Doner, 1991: 16 - 17). Hyundai has employed diversification strategy on importing technology. Hyundai Motor Company licensed over thirty different technologies to raise its standards to international levels. In some cases, Hyundai has looked to different sources for the same type of the technology(Doner, 1992: 418). With the multiple sources for technology, Hyundai came to have stronger bargaining power over its international partners than Kia and Daewoo.

Hyundai has had a tie with Mitsubishi since the 1970s.

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[52]No western auto companies would accept Hyundai's demand that Hyudai's partner participate in Hyundai's equity with no managerial rights. Only Mitsubishi Motor Company accepted Hyundai's condition. Thus, the strategy of Mitsubishi played an important role in Hyundai's maintenance of its managerial rights.

[53]For more details, please see Chapter III.

Hyundai's Pony was developed with the technical help from Mitsubishi Motor Company. Following Mitsubishi's participation in Hyundai's equity, the relationship between Hyundai and Mitsubishi has intensified. While Hyundai receives technical assistance from Mitsubishi through the licensing agreement, Mitsubishi is able to receive labor intensive components.[54]

a. Mitsubishi's Benefits from the Int'l Div. of Labor

Mitsubishi benefits from the international division of labor by the sale of technology[55] and components to Hyundai. In the past, Hyundai imported 25 percent of its parts from Mitsubishi. The 120 different parts which came from Mitsubishi included transmissions, emission control equipment, and other high-tech parts. Mitsubishi reduced the production costs by purchasing labor intensive components from Hyundai Motor Company. Hyundai exports over 265 different parts to Mitsubishi, which included interior trim, body panels and bumpers. In 1986, Hyundai and Mitsubishi agreed to jointly manufacture a mid-sized luxury car under the Grandeur name in Korea and Debonair name in Japan(Global Business Consulting, 1987: 29). The steel, seats and interior fabrics, and parts such as fuel pumps come from Hyundai Motor Company which has

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[54]Their cooperation can be characterized by complementary division of labor.

[55]In the case of Excel, the royalty that Hyundai pays to Mitsubishi is as follows; five thousand yen per engine and two thousand yen per transaxle(Korean Industrial and Technological Development Association, 1989).

competitive advantage in the low-end components. The electronics systems and transmissions come from Mitsubishi which has competitive advantage in the high-end components(Berger, 1990). From this international division of labor, Mitsubishi benefits from Hyundai's low unit cost for the labor intensive parts, while Hyundai is acquiring technically sophisticated components and technological know-how from Mitsubishi. In 1987, Hyundai and Mitsubishi made an agreement that Mitsubishi Motor Company would purchase Hyundai's Excel to be marketed in the U. S. market, under the name of Precis. Through this agreement, Mitsubishi Motor Company is able to get around the constraining import quotas.

b. Hyundai's Benefits from the Int'l Div. of Labor

The most important benefit to Hyundai Motor Company from the alliance relationship with Mitisubishi Motor Company is the technical assistance acquired in the form of licensing. In the early 1980s, Hyundai Motor Company attempted to realize economies of scale following Korean government's guide. Since the domestic demand was very limited at that time, Hyundai had to export its cars to the world markets.[56] In order to compete with the world competitors, Hyundai Motor Company needed to increase the international competitiveness by enhancing product quality. By itself, Hyundai was not able to develop such a product solely for export(Hyundai Motor Company, 1987:

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[56]In the early 1980s, the annual domestic demand for passenger cars is less than 50 thousand units in Korea.

427). To export cars to the U. S. market, Hyundai had to pass FMVSS(Federal Motor Vehicle Safety Standards). Also, Hyundai was expected to manufacture a fuel-efficient car that meet the needs of the American consumers who became sensitive to fuel-efficiency. Hyundai developed Excel in order to satisfy both the safety and fuel-efficiency standards.[57] Mitsubishi Motor Company helped Hyundai Motor Company manufacture the Excel through the technical assistance.[58] The body of the Excel was designed by Gioregetto Giugiaro.[59] However, the major components such as the engine and transmission were manufactured based on the old Mitsubishi Model--Mirage. Therefore, Hyundai had to pay royalties to Mitsubishi in producing such components. Hyundai received emission technology and safety technology for the Excel by the licensing agreement with Mitisubishi Motor Company(Hyundai Motor Company, 1987: 441). The Excel was developed by both the new technology, with innovations such as front-wheel drive, and old technology, the source of power-related components.

In addition to the technical assistance received from Mitsubishi, Hyundai was able to borrow foreign exchange from

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[57]Excel is a front-wheel drive car, which is fuel-efficient. This was state-of-the-art manufacturing technology at the time.

[58]Mitsubishi Motor Company offered Hyundai process technology as well product technology. This aspect will be analyzed fully in Chapter V.

[59]He is a famous Italian body designer. He also designed Pony in the 1970s.

Mitsubishi Bank.[60] Hyundai had to build modern manufacturing facilities in order to produce Excel with the economies of scale. A half of these facilities were to be imported from abroad, especially Japan. Thus, Hyundai needed an enormous amount of foreign exchange, especially yen. Although Hyundai Motor Company had abundant financial resources which could be used for the purchase of domestic products, Hyundai was not able to obtain sizable amounts of foreign exchange. With the help from Mitsubishi Motor Company, Hyundai was allowed to borrow 10 billion yen from Mitsubishi bank. This loan was used to purchase the modern manufacturing facilities(Hyundai Motor Company, 1987: 432).

In sum, Hyundai Motor Company was incorporated into the international division of labor in order to acquire upgraded technology to strengthen international competitiveness. And Mitisubishi Motor Company came to be allied with Hyundai in order to reduce the production costs through an outsourcing of labor intensive components and to make additional income by the sale of technology through the licensing. Table IV - 2 summarizes the incentives of Hyundai and Mitsubishi for the international division of labor .

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[60]Japan's Keiretsu has a bank in its business group. Mistubishi group has its own bank.

Table IV - 2

The Incentives for the Int'l Division of Labor

Hyundai
1. Technical Assistance
2. The Sale of Low-end Components
3. The Purchase of High-end Components
4. Financial Assistance such as the Loan of Foreign Exchange

Mitsubishi
1. The Sale of High-end Components
2. The Purchase of Low-end Components, thus reducing the production costs.
3. Additional Income by offering licensing

c. Hyundai's International Strategy

In the mid 1970s, Hyundai Motor Company began to export Pony to Central America and the Middle East. In the 1980s, Hyundai's target for export shifted to advanced countries. In 1985 Hyundai exported Excel to Canada and Great Britain. Honda was overtaken by Hyundai in the Canadian market. Hyundai Motor Company developed great confidence in its international operation because it overwhelmed Honda, the top selling imported car in Canada, in just 18 months(Helm, 1985: 49). The major reason that Hyundai entered the Canadian market was to prepare for entering the U. S. auto market.[61] In 1986, Hyundai began to export the Excel to the United States, and 350 thousand units were sold in that U. S. market(Womack et al., 1990: 262).

The most important factor that contributed to Hyundai's

[61]In 1990, Hyundai set up a production plant in Bromont, Quebec. This factory has a capacity of producing 100,000 cars annually. This plant was built to supply its cars to the U. S. market.

international competitiveness is the price in relation to quality.[62] In the mid 1980s, the Japanese automakers raised prices to counter the appreciation of the yen. The price of Excel was $ 4,995, which was $ 1,000 below Japanese vehicles in the same size class(Womack et al., 1990: 262). Hyundai was able to set a low price because of the low production costs which resulted from the low labor cost and the high labor productivity.[63] The economies of scale that Hyundai achieved in the mid 1980s, enabled Hyundai Motor Company to reduce unit cost. Thus, Hyundai was able to reduce prices significantly. The timing was very favorable, when Hyundai Motor Company began exporting the Excel to the United States. The import quota(VRA) and the appreciation has restricted the exports of the Japanese automakers. The Korean won was depreciated in the mid 1980s. Thus, Hyundai could reduce the export price of the Excel. As a result, the price gap between the Excel and the Japanese compacts had grown to more than $1,000 in the U. S. market.

Hyundai Motor Company attempted to copy Toyota's marketing strategy. Hyundai employed three marketing specialists who had consulted for Toyota America. Hyundai set

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[62]The product quality that was improved by the technical assistance from Mitisubishi Motor Company was equally important as the price. Although Yugo set the lowest price in the U. S. market, it failed because of the poor product quality.

[63]In 1985 Korean auto workers earned $2.50 an hour, while their Japanese counterparts earned $15 an hour and American auto workers earned $25 per hour(Russel, 1986). Also, see Table VI - 1.

the price below the minimum prices of the Japanese cars, following the suggestions of these marketing consultants. Hyundai maintained 100 percent control of foreign operation. Ford Motor Company proposed that it sell the Excel in the United States market. However, Hyundai declined the offer. Instead, Hyundai decided to exploit its experience in the Canadian market. Hyundai Motor Company set up Hyundai Motor America(HMA) to control marketing activities in the U. S. market.

HMA is a wholly owned subsidiary based in Garden Grove, California. It pulled some top talent from Toyota America's management. HMA began to satisfy the needs of the consumers in that end of the market which was created when the Japanese auto firms went up scale with their models. Hyundai was able to control its distribution channels by securing 150 dealers throughout the United States. Hyundai offered a higher margin to its dealers than the Japanese competitors.[64] HMA created a solid distribution base by developing a strong dealership network and by setting up a computer network linking dealers with the parts warehouse to insure that dealers can get any part they need within 24 hours. When Hyundai was setting up shop to introduce the Excel to the U. S. market, Hyundai was swamped with applications for franchises. This was because of the unexpected success that Hyundai had in Canada. The dealers

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[64]Hyundai offered the dealers 15 percent margin of average selling price in the U. S. market. Hyundai takes 7 percent margin of selling price in the U. S. market.

selected were the mega-established dealers who have a strong history and know the auto market in the United States. In 1986, the top volume dealers sold over 2,000 cars and had profits of $1.7 million(Global Business Consulting, 1987, 38 - 39). Table IV - 3 compares

Table IV - 3

Average U. S. Dealers Sales Per Outlet

1986 Rank	Outlet	Sales Per Outlet(units)
1.	Hyundai	1, 431
2.	Toyota	947
3.	Honda	716
7.	Ford	585
8.	Chevrolet	556
12.	Dodge	316
13.	Pontiac	283
23.	Plymouth	157
24.	AMC	152

(Source: Global Business Consulting, 1987)

the strength of the dealers sales.

In sum, Hyundai's international strategy can be characterized by its low-pricing based on low-production costs and the independent distribution strategy. Developing distribution channels in foreign countries is risky business. However, Hyundai Motor Company chose this way because it wanted to control the whole process of distribution network in the United States. In some ways, Hyundai utilized the safety

network by hiring former Toyota America's officers who had a great deal of marketing expertise in dealing with the U. S. auto market. Hyundai Motor Company was able to maintain indigenous ownership, indigenous managerial prerogative, and complete control of the foreign operation.

B. Daewoo Motor Company and General Motors

Responding to the threats of the Japanese, General Motors had received small passenger cars from Isuzu, Suzuki, and NUMMI. However, the import quota for the Japanese automakers restricted the GM's strategy. In 1984, GM was scheduled to receive 200 thousand units of the Spectrum from Isuzu and 84 thousand units of the Sprint from Suzuki. Due to the revised voluntary restraint agreement in 1984, GM actually received 124 thousand units of the Spectrum from Isuzu, and 60 thousand units of the Sprint from Suzuki. Therefore, General Motors began to recognize the developing countries as sourcing agents for small cars[65](Dyer et al., 1987). Table IV - 4 shows imported vehicles by General Motors. As seen in the table, Korea and Mexico became major sources for GM's compacts.

General Motors decided to select Daewoo Motor Company as

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[65]Mitsubishi Motor Company also bought the small car - Hyundai's Excel to be marketed, under the name Precis. Mitsubishi could get around the constraining import quotas for the U. S. market. While General Motors supplied small cars to the U. S. market by importing them from abroad, Mitsubishi supplied its own models, which were made in Japan, to the U. S. compact market. Thus, Misubishi's import of the Excel can be characterized as a supplementary strategy in order to circumvent the quota in the U. S. auto market.

the the site for production of small cars because Daewoo had low-wage labor, high labor productivity, and an enhanced production capacity. General Motors has been involved in the equity participation since

Table IV - 4 Imported Cars by General Motors(1987)

Partner	Product	Scale(per year)
Isuzu	Subcompact	37, 000
Suzuki	Subcompact	17, 000
Daewoo	Subcompact	80, 000
GM Mexico	K cars	20, 000
GM Mexico	Sport Truck	10, 000
GM Mexico	Heavy Vehicles	*NI
GM Mexico	J cars	*NI
GM Mexico	Subcompact	*NI

* NI means no information.

(Source: Hoffman and Kalinsky, 1988, P. 299).

1972.[66] However, the international division of labor between GM and its Korean partner began in the mid 1980s.

a. Daewoo's Benefits from the Int'l Div. of Labor

The major incentive for Daewoo's involvement in the international division of labor with General Motors was the technical assistance. In the early 1980s, Daewoo Motor Company

[66]In 1972, General Motors established a joint-venture(GM-Korea) with Shin-Jin Motor Company. GM owns 50 percent of GM-Korea. For more details, please see Chapter III.

tried to realize economies of scale, following the guide of the Korean government. Since the domestic demand was very limited, Daewoo had to be prepared to export its cars. Since 1983, Daewoo Motor Company had attempted to export the small car. However, like Hyundai Motor Company, Daewoo Motor Company was not able to develop the car solely for export purposes by itself.[67] Daewoo requested the technical assistance for this purpose. General Motors decided to have Daewoo Motor Company manufacture the Kadett which was developed by Opel.[68] This model has been sold under the name of LeMans in the U. S. and Korean markets. Manufacturing of LeMans has been done under the license of Opel.[69] Daewoo solely relied on Opel for the whole product technology, process technology, and the layout of the plant for the LeMans. In 1986, Daewoo began to produce the LeMans and exported it to the United States in 1987.[70] In addition to the technical assistance, Daewoo Motor Company came to obtain hard currency from General Motors. In fact,

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[67]Daewoo had to pass FMVSS in order to enter the U. S. market. However, Daewoo's technology could not enable Daewoo to reach the U. S. safety standards.

[68]Opel is a subsidiary of General Motors in Germany. The Model Kadett, like Hyundai's Excel, is a front-wheel drive car. Since it is fuel-efficient, General Motors thought that the Kadett could compete against the Japanese cars in the U. S. market.

[69]In the case of Hyundai, the Excel's body was designed by Italian designer, and the major components of the Excel were manufactured based on the old Mirage model.

[70]In 1986, Daewoo Motor Company and General Motors made an agreement whereby Daewoo supplies the Lemans to General Motors. Daewoo was scheduled to manufacture 100,000 units of Lemans for the U. S. market.

Daewoo Motor Company needed a substantial amount of foreign exchange in order to purchase the modern production facilities for the production of the LeMans. As was the case of Hyundai Motor Company, Daewoo was not able to secure the sizable amounts of hard currency. General Motors offered 44.5 percent of the required hard currency to Daewoo Motor Company. GM provided $ 100,500,000 to Daewoo(Daewoo Motor Company, 1989).

Like the Hyundai case, Daewoo needed its international partner for the technical assistance and foreign exchange. However, the bargaining position of Daewoo was very weak. Since General Motors had a 50 percent share of the Daewoo Motor Company, the Korean partner(Daewoo Corporation) could not possess complete managerial rights. General Motors were able to participate in the decision-making processes for the major investments and key business strategies, while Daewoo Corporation had the complete decision-making rights for the domestic sale and the labor relations.[71] Despite the equal footing in terms of the equity, Daewoo Corporation had been dominated by General Motors because Daewoo Motor Company heavily relied on General Motors for the technology. In case of the Hyundai, the source for technology is diversified. But, Daewoo's technical source was limited, so Daewoo Corporation came to be weak at the bargaining table. Daewoo attempted to

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[71]Daewoo Corporation appoints four members of board of directors, while GM does the other four members.

introduce the Japanese production system.[72] However, this plan was blocked by General Motors, which wanted Daewoo Motor Company to maintain the American system(Daewoo Motor Company, 1989). Because of the weak bargaining position, Daewoo Motor Company had to pay the highest royalties among the Korean Big Three. Table IV - 5 compares the royalty of the three Korean passenger car companies. Hyundai pays the royalty to Mitsubishi Motor Company; Kia to Mazda, and Daewoo to Opel. The high payment of royalties contributed significantly to the bad business performance of Daewoo Motor

Table IV - 5 The Royalty Comparison

Company and Model	Royalty	Percentage of Sale Price
Hyundai Excel	44, 882 won	1.1 %
Kia Festiva	59, 055 won	1.5 %
Daewoo LeMans	81, 231 won	1.7%

* 1 dollar = 800 won

(Source: Korean Automobile Manufacturers Association, 1990)

Company(Korea Credit Evaluation Company, 1989).

b. General Motors' Benefits from the Int'l Div. of Labor

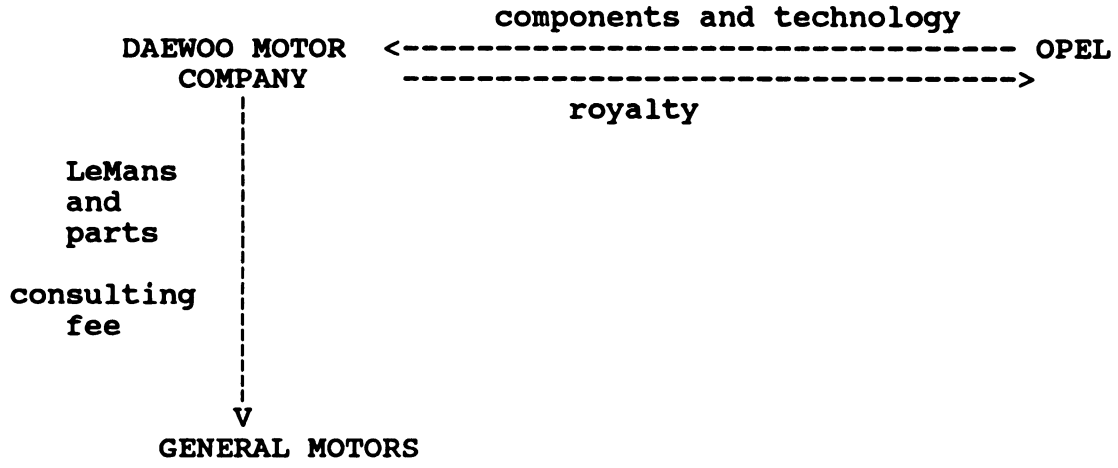
General Motors could purchase the LeMans for a low price, and take a 20 percent margin of the sale price in the United

[72]Daewoo Motor Company tried to adopt the just-in-time approach and quality control circle.

States. In addition, General Motors, like Hyundai, received low-end components and parts from its international partner -- Daewoo Motor Company. In so doing, General Motors was able to reduce the production costs. General Motors received the consulting fee for management technology from Daewoo.[73] However, unlike Mitsubishi, GM had never sold any components or parts to Daewoo Motor Company. Instead, Opel(GM's subsidiary) has sold the high-end components of the LeMans to Daewoo Motor Company. Also, Opel received royalties by offering the licensing to Daewoo(Korean Automobile Manufacturers Association, 1990). Figure IV - 1 summarizes the international division of labor among three international partners -- Daewoo Motor Company, Opel, and General Motors.

Figure IV - 1

The Int'l Div. of Labor: GM, Opel, and Daewoo



[73]Daewoo Motor Company pays 3 percent of the revenue as consulting fee for management and technology to General Motors.

c. Daewoo's International Strategy

As the case of Hyundai Motor Company, the most important factor that contributed to Daewoo's international competitiveness was the low price[74], which derived from the low production costs of Daewoo Motor Company. Hyundai's international operation was planned and executed by Hyundai. However, the international strategy of Daewoo Motor Company was controlled by General Motors. The LeMans has been sold through Pontiac distribution channels. Daewoo Motor Company exported the LeMans by OEM(Original Emblem Manufacturing). Thus, the LeMans has been sold under the Pontiac brand name in the United States. The exportation of the LeMans by OEM is a less risky business endeavor. However, unlike Hyundai Motor Company, Daewoo Motor Company had little control of the distribution network in the United States. Therefore, Daewoo' international marketing strategy had to be dependent upon General Motors(Daewoo Motor Company, 1989).

Because of the weak bargaining position of Daewoo Motor Company, it had only a 3.6 percent margin of the selling price in the United States, while General Motor took 20 percent margin. In addition, the price of royalties for Daewoo Motor Company continued to increase. Unlike Hyundai Motor Company which has multiple sources for technology, Daewoo relied heavily on Opel for technology. Due to Daewoo's weak

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[74]In the 1970s, the Japanese automakers also utilized low pricing strategy in the U. S. automobile market since they targeted low-end market at that time.

bargaining position, Daewoo had to pay a high licensing fee. The low sale margin and expensive royalty exacerbated the financial situation of Daewoo Motor Company(Korea Credit Evaluation Company, 1989). Unlike Hyundai Motor Company, Daewoo Motor Company was not able to maintain indigenous managerial rights, or possess complete control of the foreign operation.

C. Kia, Mazda, and Ford

Ford Motor Company forged an alliance with Mazda in order to obtain fuel-efficient small cars. Mazda, which is 25 percent owned by Ford, has supplied compacts and components to Ford Motor Company. Unlike Toyota and Nissan, Mazda attempted to enter the U. S. market through the collaboration with Ford. Since the early 1980s, Mazda has circumvented the import quota through production in developing countries.[75] Responding to the appreciation of the yen, Mazda set up a production plant in the United States.[76] Kia was prohibited from manufacturing passenger cars for five years by the Rationalization Program of the Korean government in the early 1980s. Thereafter, Kia prepared to reenter the passenger car market with new model

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[75]Mexico Ford supplies Mercury and Tracer, which was developed by Mazda, to Ford in the United States. Ford at Hermosillo, Mexico in fact had the best assembly-plant quality in the entire volume plant sample, better than that of the best Japanese plants and the best North American plants(Womack et al., 1990: 87)

[76]It was incorporated under the name of MMUC(Mazda Motor Manufacturing U.S.A. Corporation), and is 100 percent owned by Mazda.

which has the competitiveness in the international markets as well as the domestic market. Thus, Kia needed to obtain upgraded technology. Therefore, Kia had to cooperate with the auto TNCs such as Mazda and Ford. Mazda, meanwhile, faced the import quota due to the voluntary restraint agreement. By these dynamics, in 1983 Kia made an alliance with Mazda, which was allowed to own an eight percent share of the Kia's equity. Mazda and Kia tried to develop compacts for world markets. In 1986, Ford joined the alliance, possessing 10 percent share of Kia's equity.[77] By the agreement, Ford is excluded from the managerial rights, and Ford is not allowed to own more than a 10 percent of Kia's stock(Kia Motor Company, 1987). Through the triple relationship, Ford's Festiva was developed. Mazda designed and supplies components to Kia.[78] Kia manufactures the Festiva, and Ford sells the model through its distribution channels.[79] The Festiva has been sold under the Ford brand in the United States market. Figure IV - 2 summarizes the triple relationship between Kia, Mazda, and Ford.

As the cases of Hyundai and Daewoo, the major strength of Kia's Festiva was the low price, which resulted from the low

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[77]Ford attempted to forge an alliance with Hyundai Motor Company in order to purchase Excel. After Hyundai declined the offer, Ford approached Kia.

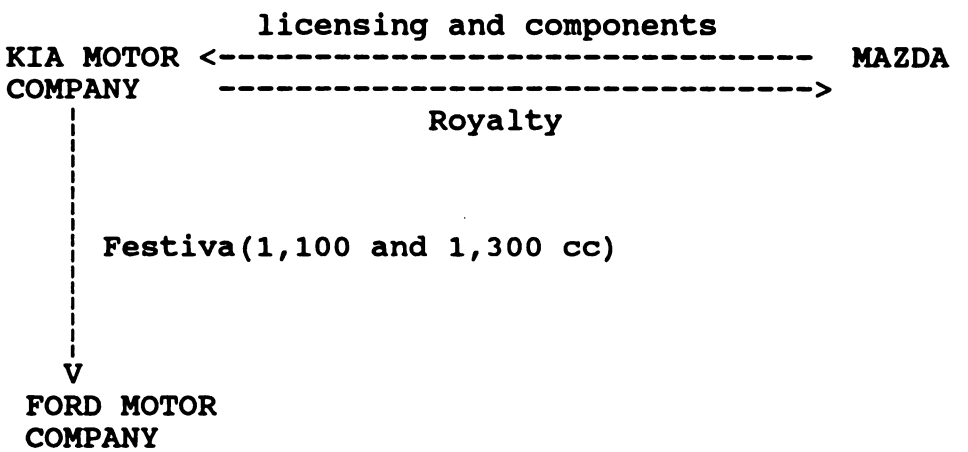
[78]Festiva was developed based on the first generation Mazda 121. The new Festiva is being developed based upon the current generation Mazda 121(Johnson, 1993).

[79]Ford agreed to purchase 85,000 cars from Kia(Global Business Consulting, 1987: 55).

production costs. Since the Korean Big Three exported their cars in low-end market, price was the one of the significant factors that contributed to the Festiva's competitiveness. Kia's performance through the international division of labor lies above that of Daewoo Motor Company, and below that of Hyundai. Like Daewoo, Kia is heavily dependent upon Mazda for technology. Thus, Kia has the

Figure IV - 2

Int'l Div. of Labor among Kia, Mazda, and Ford



weak bargaining leverage. As a consequence, it had to pay the royalties at much higher price than Hyundai.[80] Kia, as was the case of Daewoo Motor Company, was not able to control the distribution channels in the U. S. market. However, Kia succeeded in maintaining indigenous ownership and managerial

[80]Kia's royalty payment is less than that of Daewoo Motor Company. Please see Table IV - 5.

rights despite participation in the international division of labor. Unlike Daewoo Motor Company, Kia could protect itself from the foreign threats by the agreement. Therefore, in the domestic sector, Kia is independent in terms of equity and managerial prerogative. However, in the international operation, it is heavily dependent upon the auto TNCs for the upgraded technology and the international distribution channels.

4. Summary and Conclusions

The international division of labor between the Korean auto firms and the TNCs occured in the 1980s because both parties saw it advantages to collaborate with each other. While the Korean automakers needed to obtain high-level technology which strengthens the interantional competitive advantages, TNCs sought the low-cost prouction places around the world. The Korean auto firms served as the low-cost sourcing agents for the TNCs. And the TNCs played the role of technology providers.

The external dynamics such as voluntary restraint agreement and the appreciation of the yen gave a golden opportunity to the Korean automakers to attempt their entrance into world markets. Such developments allowed the Korean auto firms to be more attractive international partners to the TNCs. The domestic conditions were important for the internationalization of the Korean automakers as well. The enhanced production capacity, low wage labor, and high labor-productivity enabled the Korean automakers to join the international division of labor as low-cost producers. In addition, the favorable Korean economic conditions such as the depreciation of the Korean won, the low interest rate, and cheap oil prices boosted the international competitiveness of the Korean Big Three.

The pricing was the most important international strategy for the Korean automakers. Their low pricing strategy resulted

from their low production costs and low profit margins.[81] The performances of the Korean auto firms through the international division of labor are markedly different from one another. The financial structures and the degree of diversification of the technology source contributed to the bargaining leverage of the Korean partners. Hyundai Motor Company, the best performer, maintained indigenous ownership and indigenous managerial right. It succeeded in sustaining strong bargaining power over its international partner due to multiple technology sources and indigenous managerial prerogative. Hyundai could control the international distribution channels completely. Kia Motor Company, the second best performer, maintained indigenous ownership and indigenous managerial right. However, it failed to diversify technology sources. Thus, Kia had a weak bargaining position in the international division of labor. Kia was not able to operate international networks for itself. Daewoo Motor Company, the worst performer, could not sustain managerial rights and indigenous ownership. It had very limited technology sources. Therefore, Daewoo came to have very weak bargaining leverage in the international division of labor. Its international strategies were controlled by its international partner -- General Motors. Table IV - 6 summarized the comparison among the Korean Big Three.

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[81]The margin for the Korean partner was much less than that of the TNCs.

Table IV - 6 The Comparison among the Korean Big Three

	Hyundai	Daewoo	Kia
Indigenous Ownership	Yes	No	Yes
Managerial Prerogative	Yes	No	Yes
Technology Sources	Diversified	Limited	Limited
Bargaining Power	Strong	Weak	Weak
Control of Int'l Network	Yes	No	No
Performance Rank*	1	3	2

* The performance estimates were based on the sales and profits of the Korean Big Three(For more details, see Table III - 17 and III - 18.)

Chapter V.
The Technological Development and the Production System of the Korean Automakers

1. The Technological Development of the Korean Automakers

A. The Licensing

The Korean automakers have absorbed product technologies through licensing from TNCs.[82] As was mentioned in Chapter IV, the advanced foreign product technologies were transferred to the Korean auto firms by the international division of labor with the TNCs. In the early 1980s, the Korean auto firms began to import high level product technologies.[83]

Hyundai Motor Company has multiple sources for product technology, while Daewoo and Kia rely on limited sources for technological assistance. Table V - 1 reveals the Korean Big Three's imports of the foreign product technologies. Hyundai Motor Company imported core technologies from Mitsubishi, and Hyundai acquired other technologies from different companies. However, Kia obtained technological know-how from only one

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[82]In the modern economy, absorption of the advanced foreign technologies is made through investing in foreign license and technical assistance(Amsden and Kim, 1985).

[83]Before the Korean automobile industry was incorporated into the international division of labor, the Korean automakers imported less sophisticated technologies because they used to obtain core components from the TNCs. However, in the 1980s, the Korean auto firms began to manufacture even core components. Therefore, they had to import sophisticated technologies.

Table V - 1

The Imports of Foreign Product Technologies

	Date	Technology	Provider	Duration*
Hyundai Excel	1981. 11.	Styling	Ital Design Sol (Italy)	1
	1981. 11.	Engine and Transmission	Mitsubishi (Japan)	7
	1982. 9.	Synchronizing Ring Gear	Hiromasa Akita (Japan)	1
	1982. 11.	TJ Type Joint	GNK Transmission LTD (U. K.)	1
			NTN Toyo Bearing Co. (Japan)	10
	1983. 6.	Quality Control	Mitsubishi (Japan)	5
Kia Festiva	1984. 10.	Model Development	Mazda (Japan)	1
	1986. 10.	Manufacaturing	Mazda (Japan)	6
Daewoo LeMans	1984. 7.	Model Development	Opel (Germany)	5
	1984. 9.	Manufacturing	Opel (Germany)	5
	1987. 2.	Safety	General Motors (U. S. A.)	2

*It means year(years).

(Source: Korean Industrial and Technological Development Association, 1989)

company -- Mazda. In the case of Daewoo Motor Company, it imported the product technologies from two sources, General Motors and its subsidiary Opel.

Hyundai Motor Company sent engineers and skilled labors to foreign countries to learn technologies. Mitsubishi's training of Hyundai Motor Company's skilled labor was especially valuable and effective. For the manufacturing of the engine and transmission, Arai, the chief engineer of Mitsubishi Motor Company, educated Hyundai's engineers and skilled labors.[84] He was willing to teach Hyundai's workers engine production technique despite strong opposition to the technology transfer from some managers of Mitsubishi Motor Company. His instruction allowed Hyundai Motor Company to manufacture the engine and transmission for itself.[85] For other technologies, Hyundai engineers and skilled labors were educated in the United Kingdom, Italy, etc.[86]

B. Research and Development of the Korean Automakers

In one hand, the Korean auto firms have imported foreign

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[84]This information was obtained from interviews with the engineers who work in the Hyundai America Technical Center, Inc.

[85]Hyundai could make these components only with the blue prints offered by Mitsubishi. At that time, Hyundai Motor Company was not capable of designing the engine.

[86]The engineers and technicians of Hyundai Motor Company had to learn the appropriate foreign language for the training. The Japanese language is most easy for them to learn because Japanese is very similar to Korean. In this respect, the transfer of technology from Japan to Korea is more effective.

technology. They have developed product technology for themselves in the other hand. Thus, the Korean automakers have improved their technological capacity through the combination of the licensing and the internal development.

In 1986, Hyundai set up two technical centers in the United States. One is in Ann Arbor, Michigan(Hyundai America Technical Center Inc.: HATCI) and the other one in Los Angeles(Hyundai Motor America: HMA) to acquire advanced technology and solve technical problems. Through these technical centers, Hyundai was able to collect information on state-of-the-art technologies. They purchased the brand new models, and analyzed them mechanically.[87] HATCI, in particular, has acquired technical information on emission control, and it has attempted to monitor the technical trends of the world automobile industry.[88] Hyundai Motor Company built Korea's largest engineering and research center in 1987. The goal of its R&D is to apply state-of-the-art technologies to existing Hyundai models, to localize the production of auto parts, and to improve the sophistication of the components which are on its export vehicles(Global Business Consulting, 1987: 35). Table V - 2 reveals the trends of R&D expense and licensing fees of Hyundai Motor Company through 1980 to 1989. The expenses for research and development at Hyundai has

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[87]It is called "reverse engineering" which analyzes the products by disassembly.

[88]This knowledge was obtained through the interviews with engineering personnels in HATCI.

increased remarkably.

Kia set up Central Technological Institute in 1984. It invested $8 million and employs more than 300 engineers, most of whom have advanced degrees. One of major tasks is to reduce the foreign content of its cars. A long term goal is for Kia to have the ability to design its own vehicles without foreign

Table V - 2

Hyundai's Expense of R&D and Licensing(unit: 100 million won*)

	Licensing(A)	R&D(B)	Sales(C)	A/C	B/C
1980	8	23	2,250	0.4%	1.0%
1983	9	200	5,774	0.2	3.4
1984	7	202	6,693	0.1	3.0
1985	32	410	10,470	0.3	3.9
1986	189	823	19,064	1.0	4.3
1987	229	1,287	28,402	0.8	4.5
1988	165	1,192	34,111	0.5	3.5
1989	332	1,435	38,065	0.9	3.8

* 1 dollar = 800 won

(Source: Ministry of Trade and Industry, 1990)

assistance.[89] Table V - 3 shows the expense of licensing and

[89]Kia succeeded in developing Sportage(Sport-utility) and Sephia(Sedan) without foreign assistance in 1991. These cars are scheduled to be sold under its own badge in the U. S. market in late 1993(Gadacz, 1991).

R&D of Kia from 1980 to 1989. Its R&D expense continued to increase over time. However, the amount of R&D of Kia was far below that of Hyundai.

Daewoo Motor Company relied entirely on General Motors for research and development. However, it was working hard to develop its own capabilities. Daewoo established a "Technical Center" in 1983 to concentrate on new car development, material engineering

Table V - 3

Kia's Expenses of R&D and Licensing(unit: 100 million won*)

	Licensing(A)	R&D(B)	Sales(C)	A/C	B/C
1980	18	18	691	2.6%	2.6%
1983	-	6	4,030	-	0.1
1984	23	160	4,567	0.5	3.5
1985	22	139	5,006	0.4	2.8
1986	44	301	6,423	0.7	4.7
1987	92	309	10,530	0.9	2.9
1988	125	398	14,205	0.9	2.8
1989	155	530	18,371	0.8	2.9

* 1 dollar = 800 won

(Source: Ministry of Trade and Industry, 1990)

and testing(Gobal Business Consulting, 1987: 84). Table V - 4 indicates the trends of the expense of R&D and licensing of

Daewoo Motor Company. Like Kia, Daewoo has increased its R&D expense continuously over time. The scale of research and development of Daewoo Motor Company is close to that of Kia, and is far below that of Hyundai Motor Company.

Hyundai Motor Company has the most advanced product-technologies among the Korean Big Three. The level of Kia's product technology was slightly ahead of Daewoo's in the 1980s. The Ministry of Commerce and Industry in South Korea graded product technologies of Hyundai, Kia , and Daewoo.

Table V - 4

Daewoo's Expense of R&D and Licensing(unit: 100 million won*)

	Licensing(A)	R&D(B)	Sales(C)	A/C	B/C
1980	6	45	1,647	0.4%	2.7%
1983	5	170	2,850	0.2	6.0
1984	49	106	3,416	1.4	3.1
1985	37	252	3,636	1.0	6.9
1986	51	260	4,331	1.2	6.0
1987	66	206	9,618	0.7	2.1
1988	117	316	10,491	1.1	3.0
1989	124	444	11,413	1.1	3.9

* 1 dollar = 800 won

(Source: Ministry of Trade and Industry, 1990)

Table V - 5 compares the technological strength of the Korean

Big Three. Hyundai earned 60 points(comprehensive scores), Kia earned 25 points, and Daewoo earned 20 points. Hyundai's product technology reached 60 percent of the technology level of the advanced country in the late 1980s(Ministry of Trade and Industry, 1988). In the early 1990s, Hyundai and Kia achieved remarkable technological progress. Hyundai lessened its technological dependence on Mitsubishi, and succeeded in building its first in-house engine in 1992(Chappell, 1992). Hyundai engineers had been working on the Alpha engine for six years. The Alpha engine was placed into Hyundai's

Table V - 5

The Comparison of the Technological Strength

	Hyundai	Kia	Daewoo
Product Development	50	25	25
Design	50	15	20
Body	80	60	50
Engine	50	30	30
Electronics	40	25	25
Testing	80	35	20
Computer	20	15	0
Patent	50	15	12
Final Grade	60	25	20

*100 point is the technology level of Japan.

(Source: Ministry of Trade and Industry, 1988)

Scoup(sport-utility). The Scoupe has styling updates and the first engine designed and built by Hyundai Motor Company(Breese, 1992b). Kia succeeded in building in-house models such as Sephia and Sportage in 1991. These models were designed by Kia's engineers but in cooperation with its joint-venture partners' Ford and Mazda(Paisley, 1992). Hyundai and Kia are about to realize technological independence, while Daewoo Motor Company remains behind its Korean competitors.[90]

The Korean auto firms have caught up with the world-class automakers by the licensing of the product technologies. The licensing enabled the Korean automakers to save time in catching up with the technology level of the advanced countries. However, the self-development of the product technology through the extensive research and development allowed the Korean auto firms to reduce their dependence on foreign technology substantially.

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[90]The technology transfer between the Japanese companies and their Korean partners contrasts well with that between General Motors and Daewoo Motor Company. The technical assistance from the Japanese companies enabled Hyundai and Kia to start self-development of product technology and reduce technology dependence on their Japanese partners. However, General Motor's technical assistance created Daewoo's continued heavy dependence on General Motors for technology.

Bello and Rosenfeld argued that the Asian NICs including South Korea suffered from chronic technological dependence(Bello and Rosenfelld, 1990). However, the technological independence achieved by Hyundia and Kia flatly contradicts their argument.

2. The Production Mode of the Korean Automakers

A. The Production Facilities of Hyundai Motor Company

In the early 1980s, the Korean Big Three began to expand and upgrade their production facilities.[91] At Ulsan, which is located in the southeastern part of South Korea, Hyundai set up a lot of production plants.[92] Hyundai Motor Company built modern manufacturing facilities for export vehicles with the financial assistance of Mitsubishi. Hyundai's Ulsan complex has nothing that is technologically state-of-the-art, although some modernization is occurring. It is basically a collection of unspectacular production equipment handled by exceptionally disciplined and dedicated workers. The engineers trained by Mitsubishi squeeze the most out of their machines and the production staff is motivated to work hard(Global Business Consulting, 1987: 30).

Hyundai Motor Company introduced modern production equipments such as computer-controlled systems and industrial robots. In 1983, They began to computerize production processes. In 1985, Hyundai Motor Company introduced industrial robots in the production lines. Hyundai spent $44

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[91]In this period, the Korean auto firms expanded the production facilities in order to realize economies of scale. Also, they needed to upgrade the production facilities to manufacture high-quality cars for export purposes.

[92]In 1982, the plant for Excel was built, and in 1985 it was expanded. In 1986, the factory for automatic transmission was completed. In 1987, the plant for the Scoupe was built(Hyundai Motor Company, 1987).

million in 1987 to automate its press, body, paint, and outfitting shops. Hyundai Motor Company is aiming to invest about $1 billion in new equipment to improve quality and upgrade its production lines(Clifford, 1992a).

Hyundai Motor Company has the largest number of industrial robots among the Korean Big Three. Most of them are used for welding. Table V - 6 reveals the use of industrial robots by Korean automakers. Hyundai Motor Company employed the industrial robots for dangerous and repetitive jobs thus contributed to the growth of productivity and the product

Table V - 6

The Industrial Robots of the Korean Big Three(1988. 11.)

	Welding(%)	Painting(%)	Others(%)
Hyundai	399(86.9%)	21(4.6%)	39(8.5%)
Kia	35(70.0%)	-(-)	15(30.0%)
Daewoo	90(92.8%)	3(3.1%)	4(4.1%)
Total	524(86.5%)	24(4.0%)	58(9.6%)

(Source: Korean Industrial Bank, 1988)

quality of the Hyundai Motor Company.[93] These robots are

[93]The robot is more efficient in repetitive and dangerous jobs than workers. Thus, the use of robot enabled the automakers to enhance productivity and product quality. Hyundai Motor Company introduced the industrial robots in order to increase product quality rather than to save labor costs. Up to the mid-1980s, the wage of the Korean auto worker remained low.

operated by the computer programming.[94]

For Hyundai Motor Company, the computerization of the assembly line was introduced in order to increase efficiency and productivity in the early 1980s. The production flow is controlled by the 'central control room' via the computer. This process is called 'assembly line control'. The new process system enabled Hyundai Motor Company to reduce inventory costs, increase product quality, and raise productivity. However, the new production method that Hyundai adopted was to perform the mass production effectively by the application of computer software. It was not at all a flexible manufacturing system(Hyundai Motor Company, 1987). Its information system was fundamentally different from that of JIT.[95]

Hyundai's plants in Ulsan are not able to use just-in-time(JIT) methods because of an inadequate production control computer system and uncertainty of Korean supplier delivery and quality performance(Global Business Consulting, 1987;

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[94]There are three kinds of industrial robots.
1. The play-back robot is to perform repetitive jobs by the programmed input.
2. NC(Numerically Controlled) robot has flexibility by the NC input.
3. The robot with an artificial brain which is able to make decisions for itself. This type of robot represents the next generation of robots(Korean Industrial Bank, 1983).

[95]The information system of JIT enables automakers to manufacture broad range of product lines simultaneously. However, the information system of Hyundai Motor Company is more suited to mass production systems, which produce a limited range of products at a large scale.

Amsden, 1989). Hyundai Motor Company had to maintain the inventory for at least two days. Hyundai could reduce inventory level at the mass production system through the new technology. Hyundai's production system can be characterized as Fordism with new technology -- computerized production system.[96] Although Hyundai Motor Company utilizes some CAD(Computer Aided Design) and CAM(Computer Aided Manufacturing), it has not yet realized the flexible manufacturing system, which is operated by the extensive use of CIM(Computer Integrated System) and CAM/CAD.[97]

The significant portion of Hyundai's production facilities were imported mainly from Japan. Mitsubishi, Fanuc, and Kawasaki are the major sources for the production equipments of Hyundai Motor Company. Although Hyundai makes some of the equipments internally, it has to import key components such as sensors and controller(Korean Industrial Bank, 1989: 69). Hyundai Motor Company is heavily dependent on Mitsubishi Motor Company for the establishment of the production facilities. Hyundai's transfer plant in Canada was,

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[96]Hyundai could not realize flexible manufacturing because of the following; (1) Hyundai had no adequate production control computer system for flexible manufacturing system; (2) Hyundai had no appropriate supplier system for flexible manufacturing system. Please see the next section for the supplier system for the Korean automakers.

[97]Through CIM, automakers are able to integrate the whole production process by the application of information software. This high tech process allows auto firms to have enormous flexibility and to lower production costs substantially(For more details, see Hoffman and Kaplinsky, 1988, Chapter 8).

for example, built with the assistance from Mitsubishi engineers(Global Business Consulting, 1987: 36). Hyundai Motor Company obtained financial resources from Mitsubishi Bank, and acquired the equipments and know-how from Mitsubishi Motor Company as well as other Japanese firms.[98]

Hyundai Motor Company possesses world-class level technology of assembly, welding, and painting. However, the quality-control skill is low for the world standard. The automation rate of Hyundai is far behind that of the TNCs(KIET, 1990). Hyundai Motor Company has not introduced the state-of-the-art equipment with which flexible manufacturing can be performed.

B. The Production Facilities of Daewoo Motor Company

In the mid-1980s, General Motors and Daewoo agreed to modernize and expand the plant in Pupyong, a Seoul suburb. During the construction process, 68 Opel specialists went to Korea to help in the equipment installation and training process of the Pupyong employees, while 93 Daewoo foremen and key hourly workers were sent to Opel in Germany for training. Another 245 key workers were sent overseas for training. This preparation was necessary as the facilities were expanding its capacity four fold. Influence of Opel engineers was evident in

[98]The whole production line of Hyundai Motor Company had been designed by Ford engineers in the 1970s. And Mitsubishi engineers modified its facilities substantially. Thus, Hyundai's production process has been under Japan's influence.

the new plant as it incorporated a number of production processes not used in the United States such as a "tilt" line in trim and final assembly plant. This process permits easier access for the Korean workers. The project to build the most modern auto plant in South Korea, required $430 million.[99] This included purchasing new equipment from Japan, Germany, Sweden, and the United States. Eighteen GM-Fanuc welding robots and Italian robots were installed in Daewoo's body shop.[100] More than $25 million was spent on test equipment and related facilities to insure quality control(Global Business Consulting, 1987: 80 - 84).

In 1986, Daewoo Motor Company built the 'central control room' that controls the whole production process. Even in the old plant of Daewoo Motor Company, the high-tech equipments such as NC and CNC(Computerized Numerically Controlled) were installed. In the new plant for the LeMans, the NC robot was introduced, and a significant portion of production line was automated.[101] As a result, the productivity of Daewoo rose up to more than two times its previous output(The Korean

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[99]Daewoo Motor Company has the most advanced auto plant among the three Korean passenger car companies. It acquired the financial resources for the modern equipment from General Motors. For more details, see Chapter IV.

[100]Daewoo Motor Company has the second highest rate of industrial robotization among the Korean Big Three. For more details, see Table V - 6.

[101]Daewoo's automation rate is higher than that of Hyundai Motor Company. In particular, Daewoo's painting technique through the use of industrial robots is ahead of Hyundai Motor Company.

Automobile Manufacturers Association, 1990). However, like Hyundai Motor Company, Daewoo has not realized the flexible manufacturing system. As with the case of Hyundai, the computerization of the production system in Daewoo Motor Company contributed to the growth of the productivity and the product quality on the basis of the mass production system.[102] Daewoo's production system can be characterized as Fordism with new technology.

C. The Production Facilities of Kia Motor Company

Kia's auto plant is located in Sohari, which is a southern suburb of Seoul. It is an integrated automotive manufacturing facility which contains all stages of vehicle production, from parts tooling, casting and painting, to assembly and final testing. In 1986, Kia made an investment of $500 million into the construction of a 120,000 ultramodern facility to build the Festiva(Global Business Consulting, 1987: 60). However, Kia's production methods are still based on the mass production system. As in the cases of Hyundai and Daewoo, Kia's computerized production system lacks flexibility.[103] Thus, it is far from the flexible

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[102]Daewoo's production system was influenced by Opel and General Motors. Thus, its system is far from just-in-time approach. Also, see Chapter IV.

[103]Kia Motor Company introduced industrial robots, NC, and CNC in Sohari plant. However, like Hyundai and Daewoo, these automation facilities increase efficiency on the basis of the mass production system. Thus JIT is not available in Kia either.

manufacturing system. Kia's production system can be characterized as Fordism with the new technology. Kia, like Hyundai Motor Company, imported high-tech facilities mainly from Japanese companies such as Mazda, Fanuc, and Kawasaki(Kia Motor Company, 1989).

The Korean Big Three adopted the modern equipments in the 1980s, when they began attempting to realize economies of scale through mass production. Despite the significant automation, the Korean automakers could not realize the flexible manufacturing system, which has become new production mode in the late 20 century.[104] Their new production facility enabled the Korean auto firms to increase efficiency and productivity in the context of the mass production system. For instance, they can reduce inventory levels through the new technology at the mass production scale. Overall, the production systems of the Korean Big Three possess the characteristics of Fordism with the high-tech equipments.

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[104]Organizational innovation is one of the factors which is required for flexible manufacturing(For details, please see Chapter II). Apart from just-in-time system and central computer control, the Korean auto firms significantly lack the organizational innovation significantly. This fact also prevents the Korean automakers from realizing flexible manufacturing.

3. The Suppliers of the Korean Automakers

In the case of the Japanese automobile industry, the complete production hierarchy has been established between assembler and its suppliers(Hill, 1989b). However the Korean automobile industry lacks the systematic relationship between the automakers and the suppliers, even though the relationship between assembler and the first-layer suppliers is relatively well established. In particular, the second-layer suppliers, which link the first-layer suppliers and lower-layer suppliers, have not been developed well in Korea. Unlike the Japanese case, the relationship between assembler and suppliers has not lasted long in Korea(Ministry of Trade and Industry, 1988). It is extremely difficult for the Korean auto firms to establish just-in-time systems under these circumstance.

The Korean auto parts industry is considered to be weak and somewhat fragmented. Of the more than 900 parts-makers, many are small, undercapitalized companies which lack technical and management resources. They are usually too ill-equipped and poorly staffed to run quality programs, or to purchase expensive testing equipment(Global Business Consulting, 1987).

In the booming expansion of the Korean automobile industry, most of the auto suppliers in Korea became dedicated

to supplying only their exclusive assembler.[105] This is in part because of the pressure from the Korean assemblers, in part because of the government regulations regarding designated producers, and in part because most of Korea's suppliers are operating at near capacity(Global Business Consulting, 1987). In the early 1980s, the Korean government attempted to establish vertical relationship like pyramid style between assembler and auto suppliers. The Korean government tried to model the production hierarchy in the Japanese automobile industry(KIET, 1987).

In the early 1980s, the Korean auto makers began to farm out the production of the parts, which are not key components, to suppliers.[106] As a consequence, the assemblers could save production costs significantly. The parts which were farmed out are labor-intensive components, and the wage of the suppliers is much lower than that of the assemblers in South Korea. Because, in the early 1980s, the Korean Big Three attempted to realize economies of scale, they required a lot of standardized components.[107] Therefore, a division of labor

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[105]The assemblers expect loyalty from their suppliers and try to prevent the parts manufacturers from doing business with their competitors. Out of 260 Hyundai suppliers 140 are exclusive. Daewoo has 105 exclusive suppliers, and Kia has 111(Global Business Consulting, 1987).

[106]The Ministry of Trade and Industry forced the Korean auto firms to do so by 'The Auto Industry Rationalization Program'.

[107]In the context of mass production, it is extremely difficult for the auto assembler to produce whole standardized- components at large scale.

between the assemblers and their suppliers was necessary.[108] The assemblers came to manufacture only core components and just assemble the components which were delivered from the suppliers.[109] As a result, the Korean auto firms could increase efficiency and reduce the production costs substantially through the division of labor with the suppliers. In fact, the suppliers were not able to manufacture large amounts of components because they lacked sufficient financial resources.[110] In addition, they were expected to produce high-quality parts for the export cars. Thus, the assemblers had to help their suppliers financially and technically. In 1986, Hyundai Motor Company offered 175 suppliers technical and managerial assistance. Table V - 7 shows Hyundai's technical and managerial assistance in 1986 and 1987. Hyundai Motor Company helped its suppliers meet the mass-production requirement. Hyundai offered financial assistance to its suppliers by providing large amounts of raw materials such as steel[111](Hyundai Motor Company, 1987). Kia Motor Company also offered assistance to its 274 suppliers, as did Daewoo Motor Company to its 340 suppliers(KIET, 1987).

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[108]Suppliers came to be specialized in order to meet mass-production requirements.

[109]About 30 percent of the value of Korean cars are sourced in house(Global Business Consulting, 1987: 2).

[110]In order to produce large amounts of components, the suppliers had to set up appropriate production facilities.

[111]The suppliers pay back their liabilities when they sell the components to Hyundai Motor Company.

Table V - 7

Hyundai's Technical and Managerial Assistance to its Suppliers

	Sector	Number of Suppliers 1986	1987
Hyundai Assistance	Heating Painting Welding	112	298
Assistance from both Hyundai and Other Firms	Quality Control	13	21
Assistance from Foreign Engineers through Hyundai	Productivity Cost Control	50	90
Total		175	533

(Source: Hyundai Motor Company, 1988)

In order to manufacture the high-quality components for the export-vehicle, the Korean part suppliers imported technology through licensing. In some cases, the Korean suppliers made joint-ventures with foreign companies. Also, the Korean assemblers and foreign suppliers established part-suppliers through the joint-ventures. Table V - 8 reveals the Korean suppliers' technology-import and the joint-ventures with foreign companies. As was seen in the table, Japan is a major technology-source for the Korean suppliers. In case of the joint-venture, the Ministry of Trade and Industry prevented the foreign companies from participating in management. Thus, these suppliers have been run by indigenous capitals(Ministry of Trade and Commerce, 1988). Table V - 9 shows the joint-venture between the Korean assemblers and foreign companies.

Table V - 8

The Korean Suppliers' Technology-Import and the Joint-Venture

(Unit: Frequency and Percent)

# of Firms		Japan	USA	Germany	UK	Other	Total
Tech Import	125	154 66.4%	32 13.8	20 8.6	20 8.6	6 2.6	232 100
Joint Venture	65	41 58.6%	19 27.1	6 8.6	2 2.9	2 2.9	70 100

(Source: The Korean Auto Industries Coop. Association, 1988)

In the 1980s, the relationship between the Korean assemblers and their suppliers had changed from fragmented statuses to more closely related ones. As was mentioned above, the assemblers attempted to help their suppliers by offering financial and technical assistance.The three Korean passenger car companies came to set up exclusive suppliers networks. However, they could not establish harmonious working relationships between assemblers and suppliers. According to the Korean auto Industries Cooperation Association, the long-term contract[112] between the Korean assemblers and the Korean auto suppliers accounts for less than 30 percent(Korean auto Industries Coop. Association, 1988). Other than contracted order, there are very few future order guarantees for the suppliers. This gives the assemblers' leverage in future negotiations, as well as a way to source their components from higher quality manufacturers(Global Business Consulting,

[112]Its period is more than 3 years.

1987). In case of the price rise of raw material, suppliers had to accept the burden because of weak bargaining power of suppliers. The payment to suppliers by the assemblers is made by a method of bills receivable that can be honored after 60 days(KIET, 1987).[113] Unlike the Japanese case, the Korean automakers and their suppliers lack intimate social relations.[114]

Under the guidance of the Korean government the Korean assemblers tried to establish exclusive supplier networks and to assist their suppliers financially and technically, following the Japanese production hierarchy which has a vertical relationship between assembler and suppliers. However, the Korean assemblers exploited their suppliers for the purpose of cost saving.[115] Therefore, they failed to make intimate soical reltionship with their suppliers. In turn, unlike the Japanese counterparts, the Korean automakers could

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[113]This payment method was utilized by the assemblers in order to delay their cash payment. The suppliers had to accept the unfavorable payment condition because of their weak bargaining leverage.

[114]The Japanese automaker has established long-lived, intimate social relationships with their suppliers through the Keiretsu network. But the Korean automakers have had no such Keiretsu-like networks. It is believed that the Korean auto assemblers considered their suppliers as the sources of cheap production costs rather than as business partners. As mentioned above, the Korean automakers have exploited their suppliers by their superior bargaining leverage. Amid this climate, it was very difficult for the Korean suppliers and assemblers to develop intimate social relation.

[115]Under this circumstance, the Korean suppliers can hardly develop as the world-class makers.

not establish a long-lasting and systematic production hierarchy. This is one of the critical barriers preventing the Korean auto firms from achieving a flexible manufacturing system. As mentioned above, with unstable supplier delivery and poor quality performance, it is extremely difficult for assembler to establish flexible manufacturing.

Table V - 9

Joint-Venture btwn the Korean Assemblers and Foreign Companies

(Unit: Percent)

Company	Component	Ownership
Hyundai's Suppliers		
Korean Engelhard	Catalytic Converter	US Engelhard(40) Hyundai(20) Lucky(40)
Kepico	Fuel Injection System	Mitsubishi(25) Bosch(25) Hyundai(33) Hyundai Electronics (16)
Kia's Supplier		
TRW Steering	Steering	TRW(51) Kia Machinery(49)
Daewoo's Suppliers		
Koram Plastics	Bumper	GM(50) Daewoo(50)
Shinsung Packard	Wire Harness	GM(50) Daewoo(50)

(Source: The Korean Auto Industries Coop. Association, 1992)

4. The Labor Relations of the Korean Automakers

A. The History of the Korean Labor Relations

Following Korea's liberation from Japan, South Korea was under the rule of the U. S. Occupying force from 1945 to 1948. The American military government stifled labor activities because the labor movements were led by the communists in South Korea. After the Syngman Rhee's government was established in 1948, the labor movement continued to be prohibited since the labor activities were utilized politically by the communists and left-wing activists in South Korea. The Korean government set up the Korean Labor Federation which is pro-government and anti-communist. The Korean Labor Federation was built for the political purpose of the Korean right-wing government. Since the real labor activities were prohibited, the labor unions could not protect the rights and the interests of the workers in South Korea. Because of the ideological confrontation between North and South Korea, the activities of the labor unions in South Korea had been very limited, and they served the interests of the Korean government. As a consequence, the enterprises benefited from the labor policies of the Korean government because business could have strong bargaining leverage over the labor.[116] In this circumstances, the Korean business began to

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[116]At that time, South Korea had enormous labor surplus, the unemployment rate reached 20 percent. This condition further weakened the bargaining power of the labor in South Korea(Korean Chamber of Commerce, 1988). The Korean labor market was

exploit labor by the authoritarian rule(Korean Chamber of Commerce, 1988). Since then, no social contract for the labor force has existed in South Korea.

In 1953, the labor law was enacted, and labor activities were allowed. Some labor disputes arose because of low wage and poor working conditions. After Syngman Rhee's government was overthrown by the Civilian Revolution in 1960, the labor activities erupted rapidly, and the workers' demands were resolved in most cases.[117] In 1961, the Korean military overthrew the civilian government, and the Army General Park Chung Hee took power until his assassination in 1979. The military government began to restrict labor activities significantly.[118] Since 1971, Park's government had prohibited labor activities. The government set the high economic growth policy, which was based on Korea's cheap labor. In order to keep wages frozen, the government had to repress labor activities strongly(Korean Chamber of Commerce, 1988).

General Chun Doo Whan took power after the assassination of Park by the military coup in 1979. His government had the

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characterized by high job insecurity and low wages(Douglass, 1992: 11).

[117]The labor union of Sae-Na-Ra Motor Company(former Daewoo Motor Company) was formed in this period(Park and Choi, 1989: 22).

[118]The Korean unions have never been allowed into political parties, and they became "paper unions" set by the companies as a strategy of avoiding pan-industry unionization(Douglass, 1992). The formation of the labor union of Hyundai Motor Company failed in the late 1960s(Park and Choi, 1989: 22).

same labor policy as Park's government.[119] In 1987, General Chun gave up his military dictatorship, and Roh Tae Woo was elected as the president. Thereafter, South Korea was democratized, and the labor activities began to be legalized.

B. The Labor Relations in the Korean Automobile Industry

As the Korean auto firms began to achieve mass production in the early 1980s, they introduced the scientific management approaches such as Taylorism. Hyundai Motor Company suggested the standardized-motion for the workers. It introduced 'industrial engineering', 'value analysis', and 'product maintenance'. Daewoo Motor Company adopted 'value engineering', and 'zero-defect movement'. Kia Motor Company introduced stop-watch, and suggested the standardized-motion for its workers. Kia adopted the 'pay for performance' policy.[120]

The Korean auto workers had been controlled by Taylorism and strong repression until 1987.[121] The authoritarian Korean government had repressed the labor activities in order to keep

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[119]Only enterprise unions were permitted. Thus, third parties such as industrial unions were totally excluded in negotiations(Park and Choi, 1989: 24).

[120]According to this system, company pays worker based on his productivity.

[121]In 1987, South Korea realized a democratic political system, and the political repression of the labor movement was lifted. Since then, the labor strikes of the Korean automakers and their suppliers erupted. As a consequence, the wage of the Korean auto workers has skyrocketed.

wage frozen.[122] In fact, the low wage in the Korean automobile industry contributed significantly to the international competitiveness of the Korean automakers.[123] The severe labor strikes(1987 - 1988) changed the labor practices of the Korean auto firms substantially. The Korean Big Three attempted to introduce human-relations practices. They introduced ESOP(Employee Stock Ownership Plan) and the Japanese-style labor practices such as the quality control circle. In the late-1980s, Hyundai Motor Company tried to build a good quality circle movement.[124] But, it was not able to realize the level of success of Japanese one. This was because the Korean auto workers did not yet have enough experience; they were not experts in their jobs. They had to do more work than Japanese workers to improve quality(Amsden, 1989: 178). The new labor practices were not established effectively because Hyundai Motor Company introduced this system abruptly without proper preparations.[125]

Influenced by Toyota's suggestion box program, Hyundai

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[122]The labor union existed in Korea, but it did not function well because of the political repression of the Korean government.

[123]For more details, see Chapter VI.

[124]Every five or six stations on every line has its own quality circle.

[125]The Korean managers have long treated their workers as sources for cheap production costs. Without fundumental restructuring of the managerial attutude, the intimate social relation between management and labor could not be established. Thus, new labor practices failed to be rooted in the Korean business environment.

Motor Company introduced the employee's suggestion system in the early 1980s. The average number of suggestions and the adoption rate had increased continuously up to the mid-1980s. Table V - 10 shows the employee suggestions of Hyundai Motor Company.

The changes in the labor relations since the democratization in South Korea(1987) caused the Korean automakers to suffer from the rapid rise of wages, which decreased the international

Table V - 10

The Employee Suggestions of Hyundai Motor Company

Year	Number of Suggestion Per Employee	Adoption Rate
1982	1.8	47%
1983	2.0	51%
1984	2.3	54%
1985	2.8	67%
1986	5.0	70%

(Source: Hyundai Motor Company, 1987)

competitiveness of the Korean automakers.[126] Table V - 11 shows the hourly wage for auto workers in the United States, Japan, Mexico, Brazil, and Korea. The wage of the auto workers in Korea had increased steadily up to 1987. However, after that, it began to ascend rapidly. In 1986, the wage of the

[126]While the new labor practices were not successful, the severe labor strikes resulted in the rapid rise of the wage of the Korean auto workers.

Table V - 11

The Hourly Compensation(in U. S. dollar) for Auto Workers

	USA	Japan	Mexico	Brazil	Korea
1975	9.53	3.56	2.94	1.29	0.48
1980	15.88	6.97	4.38	2.01	1.33
1985	19.63	8.09	2.66	1.64	1.92
1986	19.97	11.08	2.03	-	2.00
1987	20.51	13.83	2.45	-	2.32
1988	21.11	16.36	-	-	3.41
1989	21.51	15.65	3.12	-	4.92

(Source: 1991 Wards' Automotive Yearbook)

Korean auto workers is approximately one tenth of that of the United States. In 1989, it rose to one quarter of the wage of the U. S. auto workers. In comparison with Japan, the wage level of the Korean auto workers rose from one fifth the wage of the Japanese auto workers in 1986 to one third in 1989. The wage of the Korean auto workers began to surpass that of Latin America in 1989. Since the wage level of South Korea exceeds that of other NICs, the labor cost in the Korean auto industry can no longer bear international competitive advantage.

5. Summary and Conclusions

The Korean automakers have improved their technologies by the licensing and self-development efforts. The international partners of the Korean auto makers were major sources for the advanced technologies. They helped the Korean auto firms establish the upgraded production facilities.[127] The extensive research and development of the Korean auto firms enabled them to achieve technological independence in the early 1990s. Hyundai Motor Company came to be able to build engines in house, while Kia succeeded in designing the new model(Sephia) for itself.

The Korean auto firms attempted to upgrade their production facilities in the 1980s. However, they were not able to have the flexible manufacturing system, which has become the new production mode in the late 20th century. Although the Korean automakers introduced the computerized production system, they could not escape from the traditional production system. At best, the new technologies enabled the Korean automakers to increase efficiency in the context of Fordism. Thus, the production system of the Korean auto firms can be characterized as Fordism with the new technology.

The production hierarchy of the Korean automobile industry has not been developed well. As a result, the Korean

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[127]The Korean automakers benefited significantly from the international division of labor by absorbing the product and process technology.

automakers could not establish the flexible manufacturing systems like just-in-time production. In addition, the inadequate production control computer system and the low quality-performance of the suppliers prevented the Korean auto firms from adopting the just-in-time approach.

The Korean Big Three had controlled their workers through Taylorism and the authoritarian rule until 1987. After the democratization of South Korea(1987), the Korean automakers lifted the repression of the labor activities of the Korean auto workers, and tried to introduce the new labor practices. The wage of the Korean auto workers began to rise rapidly. The new labor practices turned out to be unsuccessful in Korea. As a consequence, the international competitive advantages of the Korean auto firms decreased substantially because it was the low relative wage that contributed significantly to the international competitiveness of the Korean automakers.

In the late 1980s, the Korean Big Three were unsuccessful in developing the efficient production system(the lean or flexible manufacturing system) to offset the effect of the rapid wage rise in the Korean automobile industry. Thus, they could not avoid the substantial decline of their international competitiveness.

Chapter VI.

The Limitations of the Korean Automakers and their Future Aspects

1. The Limitations of the Korean automakers

The emergence of the Korean auto firms as the world-class automakers in the 1980s resulted from low labor costs and the high labor productivity and favorable domestic economic conditions.[128] The Korean automakers sold 500 thousand passenger cars in the United States in 1988. Hyundai Motor Company sold 263,310 Excels in that year. Since then, their performances have plummeted. In 1989, Hyundai sold only 183,261 cars in the U. S. market, 30 percent less than in 1988(Economist, Feb. 3, 1990). In 1990, its sales in the U. S. market fell to 137,448 (Breese, 1992e). The sales of the Korean cars in the U. S. market fell to 196,286 in 1990, 60 percent less than in 1988(Gadacz, 1992a). In 1991, Hyundai's sales in the U. S. market shrank to 117,630, and in 1992, they dropped to 100,457(Breese, 1992e).

As the conditions under which the Korean automakers gained international competitiveness eroded, their exports began to stagnate. Wages in Korea rose significantly and the

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[128]The favorable economic conditions in Korea were the depreciation of the Korean won, low interest rates, and low oil price. For more details, see Chapter IV.

Korean currency soared.[129] Thus, the price of Korean cars had to rise. The price gap between Korean cars and the Japanese compacts narrowed. The price of the Excel was lower by $2,200 than the Honda Civic in 1988. However, the gap shrank to $1,561 in 1990. The Korean automakers lost the low-pricing advantage that was the most important factor contributing to their international competitiveness. Table VI - 1 shows the price changes Korean automakers and their Japanese counterparts in the U. S. market.

Table VI - 1

The Price Change of the Compact in the U. S. Market

Company	Model			88	89	90
Toyota	Tercel	DXL	4 door	$8,328	$8,538	$9,028
Honda	Civic	DX	4 door	9,095	9,190	9,440
Hyundai	Excel	GL	4 door	6,895	7,399	7,879
Kia	Festiva	LX	3 door	6,906	7,364	7,750
Daewoo	LeMans	LE	4 door	8,149	8,349	8,904

(Source: 1991 Ward's Automotive Yearbook, Consumer Reports 1990)

Labor disputes and strikes caused quality problems(Economist, Feb. 3, 1989). The U. S. National Highway

[129]Korea's rising exports after 1985 were linked to the appreciation of the Japanese yen. However, as the Korean won began to appreciate, this effect was gone. Also, the interest rates went back up.

Traffic Safety Administration investigated 500,000 1986 to 1989 Excels for vehicle locking problems that had resulted in 10 accidents(Breese, 1992c). Initial Quality Survey evaluated the Excel in the bottom 10 car models in 1992(Breese, 1992a).

The troubles of the Korean automakers were caused directly by bitter strikes[130], which caused a significant rise in labor costs and the low-quality products. However, the real problem was that Korean automakers had failed to develop an efficient production system to compensate for the skyrocketing labor costs. The abrupt introduction of Japanese labor practices turned out to be unsuccessful.[131]

The Korean automakers could not establish a flexible manufacturing system. Even though they introduced new process technology in the 1980s, the Korean Big Three, at best, could increase efficiency based on the mass production system. Thus, the Korean auto firms could not deal with the labor strikes and the rising wages because they had maintained the conventional production system and authoritarian labor strategies (until 1987 year of the democratization in South

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[130]South Korea had ideological class conflict, and pursued rapid economic growth based on cheap labor. Thus, the labor organizing activities were very limited, and the Korean work force was exploited by the enterprises. Korean labor was unable to achieve a social contract with management. Japan hasn't had such ideological confrontation in the early 1950s, and it has maintained a democratic system since the World War II. Japan hasn't had the same barriers to a social contract between management and labor.

[131]Through the new labor practices, the Korean auto firms attempted to build harmonious relationship between management and labor, and to increase production efficiency.

Korea). Thus, the Korean Big Three failed to respond to the emergence of the new production mode in the late 20th century. They should have adopted flexible manufacturing and new labor practices before the labor disputes erupted.[132]

[132]Under the new process method, wages account for less than 15 percent of the automobile production cost(Richman, 1993). Thus, the Korean automakers, which could not implement the flexible manufacturing system, lost cost-competitiveness in competition with the automakers which are equipped with FMS.

2. The New Direction of the Korean Automakers

In order to compensate for the loss of the exports in the late 1980s, the Korean Big Three attempted to sell more cars in the domestic market. Until 1987, share of exports in total auto production had increased. In 1988, it began to decline, and it plummeted in 1989. Since 1988, the domestic share in total Korean auto production has risen. Table VI - 2 reveals this trend.

Table VI - 2

The Domestic and Exports Share for the Korean Auto Production

	Domestic Share(%)	Exports(%)	Total
1980	44,748 (75.3%)	14,646 (24.7%)	59,394
1981	50,450 (75.7%)	16,177 (24.3%)	66,627
1982	78,512 (84.8%)	14,067 (15.2%)	92,579
1983	103,434 (86.4%)	16,340 (13.6%)	119,774
1984	105,870 (68.5%)	48,630 (31.5%)	154,500
1985	134,509 (53.0%)	119,099 (47.0%)	253,608
1986	154,561 (34.1%)	298,702 (65.9%)	453,263
1987	246,714 (31.6%)	534,837 (68.4%)	781,551
1988	318,010 (36.1%)	563,978 (63.9%)	881,988
1989	499,949 (59.0%)	346,835 (41.0%)	846,784
1990	604,238 (64.1%)	338,968 (35.9%)	934,206

(Source: Korea Auto Industries Coop. Association, 1991)

In 1986, the share of exports began to surpass the domestic share.[133] However, in 1989, the latter overtook the former. In the late 1980s, despite the decline in auto exports, automobile productions continued to grow in Korea.[134] But, the increased auto production had to be absorbed by domestic demand.[135]

The Korean automakers began to diversify export markets to deal with the decline of their sales in the United States. In 1988, when the Korean auto industry's exports peaked at 546,310 units, Korean cars were selling in 102 countries. But the two markets, the United States and Canada, accounted for over 80 percent of sales. To counter a steep sale slump in North America since then, Korean automakers have pushed aggressively into new markets. Their diversification efforts appear to be paying off. Although the Korean auto industry's overseas shipments in 1991 were off 30.7 percent from the 1988 high, its cars are selling in 145 countries. In 1991, its dependence on the U.S. and Canadian markets was cut to 60.4 percent of the industry's total exports of 1990(Gadacz, 1992a). Table VI - 3 shows this change in the exports of the Korean automobile industry. As was seen in the table,

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[133]It is linked to the reevaluation of the Japanese yen in 1985.

[134]The share of Korean auto production among the world automobile production reached 2.8 percent in 1990(Ward's Automotive Yearbook, 1991).

[135]The Korean government helped the Korean automobile industry by attempting to increase the domestic demand for passenger car by the tax cut.

shipments in 1991 to the United States, still the industry's largest export market, fell 12.8 percent from 1990, to 171,024 units. As a result, the U. S. share of Korea's total auto exports dropped to 45.2 percent. In sharp contrast, export to

Table VI - 3

South Korea's Vehicle Exports

	1990	%	1991	%	Percent Change
USA	196,286	57.8%	171,024	45.2%	- 12.8%
Canada	54,888	16.2%	57,592	15.2%	+4.9%
Europe	29,605	8.7%	72,860	19.2%	+146.0%
Others	58,662	17.3%	77,124	20.4%	+31.5%
Total	339,441	100.0%	378,600	100.0%	11.5%

(Source: Automotive News, March 16, 1992)

Europe skyrocketed 146 percent in 1991, to 72,860 units, making Europe Korea's second leading export market. In 1990, Europe accounted for just 8.7 percent of Korean exports. However, exports to this region grew to 19.2 percent in 1991. In Europe, a bastion of small-car makers, Hyundai Motor Company initially elected to concentrate on the United Kingdom, the Netherlands, Belgium and Italy. In 1991, Hyundai began exporting to Germany, the biggest and most important market in Europe(Gadacz, 1992b). Except France, Hyundai Motor Company has set up shop in every country in Europe(Gadacz,

1992d). Kia Motor Company entered the European market in 1991 when Mazda allowed it to begin shipping the Festiva, which is based on the Mazda 121, to Britain. Daewoo Motor Company had been shut out of the European market because of export restrictions imposed by General Motors(Gadacz, 1992b).

The Korean automakers began to enter the Eastern European markets. Hyundai's sales in Yugoslavia soared in 1990, to 8,318 from virtually zero in 1989. Hyundai Motor Company managed an equally astonishing feat in Poland, shipping 10,278 units in 1991 compared to 610 in 1990(Gadacz, 1992b).

Hyundai is projecting exports to Latin America. Hyundai has plans to sell the Excel, Elantra, Scoupe and Sonata in this region. Kia mobilizes the Ford sales network to export the Festiva to Venezuela while building its own sales arm in Brazil and Colombia(Gadacz, 1992a).

In sum, the Korean automakers have tried to diversify their exports markets to solve the slump in the sales in North America. Europe has emerged as Korea's second-largest car export market. Korea exported 109,414 units to Europe in 1992(Gadacz, 1993).

3. The Korean Automakers and the Regional Division of Labor

The world economy has been dominated by powerful regional economies. Regionalization of the world economy is most visible in big power interest in regional trading blocs: NAFTA(North American Free Trade Agreement), EC, and the Asian bloc(Hill and Lee, 1992). In the Asian bloc, Japan takes a leading role, and the Asian NICs and the ASEAN(Association of Southeast Asian Nations: Thailand, Indonesia, Malaysia, and Philippines) are followers.[136]

As Japanese firms develop new technology, they are transferring mature technologies to the Asian NICs and the ASEAN countries. This kind of technology transfer has boosted the industrialization in the Asian NICs and ASEAN, while enabling Japan to maintain a leading goose position in the regional development(Cumings, 1984).

The regional division of labor in the Asian automobile industries is a good example of the flying geese model. The product cycle dovetails the dynamics of the Asian economic bloc. In the 1930s, a Japanese economist, Kaname Akamatsu, formulated a product cycle model of industrial development from perspective of a follower country, as Japan was at the time. He described the product cycle as 'wild geese flying in orderly ranks forming an inverse V just like airplanes' fly in formation(Kojima, 1977: 15).

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[136]In this region, South Korea and Taiwan assume middle positions. For more details, see Chapter III.

Japan's early relation with the Asian NICs and ASEAN countries conformed to the product cycle descriptions of a "middle country" -- one that imported from developed countries and exported to developing countries. Taiwan and Korea have historically been receptacles for declining Japanese industries, and have followed Japan in the flying geese formation just as Japan followed the lead geese in the west.

The Japanese automakers, especially Mitsubishi and Mazda, have transferred their mature technologies to the Korean automakers. Kia's Festiva is the old model of Mazda 121.[137] The new Festiva has been developed based on the current model of Mazda 121 by the licensing from Mazda. The technology transfer between Mazda and Kia proves the flying geese model empirically. The technology transfer between Mitsubishi and Hyundai also supports the product cycle theory in the context of the regional division of labor. Although the body of Hyundai's Excel was designed by the Italian designer, the underbody of the Excel was developed based on Mitsubishi's old Mirage Model.[138] Thus, the Excel was manufactured by the old

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[137]When Mazda offered licensing to Kia Motor Company, Mazda decided to give the old technology, which was behind Mazda's current technology by one generation. As Mazda developed the new Mazda 121, it transferred the technology of the current Mazda 121 to Kia Motor Company.

[138]When Hyundai exported its Excels in the 1980s, Mitsubishi was selling new Mirage, which was ahead of the Excel by one generation.

technology of Mitsubishi Motor Company.[139] In addition to the product technologies, both Hyundai and Kia have received the process technologies from their Japanese partners and the Japanese companies.[140] The transferred process technologies from the Japanese companies were not the most advanced ones. This is one of factors that prevent the Korean automakers such as Kia and Hyundai from achieving flexible manufacturing. Overall, the transfer of the product and process technologies between the Japanese companies and the Korean auto firms, can be explained by the flying geese model. In the context of the regional division of labor, both Hyundai and kia are able to make technological progress, but, behind Japan. Since Daewoo Motor Company, which was divorced from General Motors in 1992, is scheduled to forge an alliance with Honda,[141] the flying geese model will eventually apply to the technological progress made by all three Korean passenger car companies.

The Korean automakers have followed the international

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[139]Although Hyundai received old technology from Mitsubishi Motor Company in the context of the regional division of labor, the technology tie with the Mitsubishi allowed Hyundai Motor Company to break out of technology dependence in this circumstance. Bello argued that the regional division of labor in East Asia deepened the technological dependence(Bello, 1993). However, the Korean automakers such as Hyundai and Kia improved their technologies enormously through the regional division of labor, and they are about to achieve technological independence. Thus, Bello's argument is contradicted by the empirical cases of Hyundai and Kia.

[140]For more details, see Chapter V.

[141]Honda and Daewoo Motor Company agreed to jointly manufacture and sell luxury cars with engine capacities of 3,200 cc, including the Honda Legend(Nikkei Weekly, Nov. 2, 1992). Honda would supply engines and key components to Daewoo(Johnson, 1992b).

strategy of the Japanese automakers. The Japanese auto firms employed the U. S. experts for the sales in the U. S. market. The Korean automakers such as Hyundai and Kia, hired the American experts who had once worked for the Japanese companies. In 1992, Hyundai Motor America hired Doug Mazza, former Mitsubishi and Suzuki executives, in order to overcome the slump in the U. S. market(Breese, 1992d). In 1993, Kia Motor Company decided to employ Greg Warner for the sale of the Sephia and Sportage in the U. S. market. Warner had worked for Ford, Toyota, and Hyundai(Breese, 1993). Kia and Hyundai Motor Company have followed the Japanese track in the international marketing. Through the product cycle, marketing ideas as well as product technology, are transferred from the leading goose(Japan) to a goose flying in the middle(Korea).

Recently, the Korean automakers began to transfer their technologies to the ASEAN automakers through licensing agreements and direct investment. Hyundai Motor Company is now assembling the Excel in Thailand in a joint-venture with United Auto Sales, Ltd of Bangkok(Gadacz, 1992e). Kia Motor Company is assembling Kia's Festiva in the Philippines and supplying truck and van kits to Indonesia's Udatinada Group(Gadacz, 1992c; Branigin, 1992). Kia signed the technology transfer deal with Indonesia's Humpuss group to assemble 20,000 light trucks annually from 1993, rising to

50,000 units two years later[142](Clifford, 1992b). Daewoo Motor Company has been involved in auto production in Ho Chi Min City, formerly Saigon, in a joint-venture with Vietnam's Mekong Corp.(Maeyama, 1992).

The Korean automakers, as flying geese in the middle, began to transfer their technologies to the ASEAN, the flying geese at the end of the formation. As the Korean auto firms learned from the Japanese automakers and ascend the auto-manufacturing ladder, the Korean automakers become capable of providing the ASEAN countries with less complex technologies.[143] This process is likely to speed up as the Japanese move upmarket, ceding the production of downmarket or entry-level vehicles to the Asian NICs(Donner, 1991: 88).[144]

In the flying geese formation, the Japanese automakers as the leading geese, maintain state-of-the-art technologies, and transfer standardized or mature technologies to the Korean auto firms, the flying geese in the middle. In turn, the Korean automakers transfer the entry-level technologies to the ASEAN automakers, the flying geese in the end position. Thus,

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[142]Kia Motor Company has also signed a licensing agreement with Iran's Saipa business group to assemble Kia's Festiva in Teheran(Gadacz, 1992e).

[143]The technology that is transferred by the Korean auto firms is the assembling know-how, which is entry level technology.

[144]The regional division of labor between the Japanese automakers and those of the Asian NICs tends to be a horizontal rather than vertical division of labor. The Japanese auto firms will concentrate on the high-end automobiles, while the Korean automakers will specialize the production of the low-end automobiles.

the automobile industries in the Asian bloc have three hierarchial positions in terms of product cycle of the automobile. The regional division of labor in the Asian bloc, built in the days of the Japanese colonialism(1910 - 1945), reemerged in the late 20th century.[145] The regional division of labor in the automobile industry is a concrete example of Cumings' product cycle model[146] of the Asian economic bloc.

In the future, Korean automakers are expected to continue diversifying their exports markets, escaping from the heavy dependence on the North American market. They will be intensively involved in the overseas production in the ASEAN countries, and will transfer mature or standardized auto technologies extensively to the ASEAN automakers in the context of the regional division of labor.

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[145]For more details, see Chapter III.

[146]This model explains the external dynamics of the East Asian political economy. However, Cumings' model disregards internal factors such as social relations in each country. The physical technology was easily transferred from Japan to the follower countries through the product cycle ladder. But, the Japanese social aspects such as suppliers network and labor relations, were not transmitted very well because the follower countries have different social and political environments.

4. The Comparison Between the Korean Automobile Industry and that of Latin America

As firms in the NICs, Korean automakers grew to be the world-class car makers. However, auto firms in the Latin American NICs still remain second-class. Despite extensive government policies to promote the motor industry in the 1950s, Latin American NICs failed to establish indigenous ownership of car assemblers. Their promotion policies for the automobile industry could not be implemented because of the threats of the TNCs. In case of Mexico, the government policies were hindered by pressures from TNCs and the U. S. government. The similar pressures were brought to bear by the Japanese government on behalf of Nissan using continued access to the Japanese market for Mexican cotton, as a lever with which to obtain the acceptance of the firm's production plan(Jenkins, 1987: 61).[147]

In the course of the 1960s, the major auto TNCs increased their penetration of the market in Latin America, taking over licensees, acquiring independent national firms and driving out national competitors.

In Argentina in the early 1960s, two thirds of output was produced by firms with more than 50 percent local capital. In Brazil, one fifth of output was by local firms and the largest

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[147]The Japanese government activities on behalf of Nissan in Latin America contrasts with the strategies of the Japanese TNCs in East Asia. The Japaese TNC strategies may vary, depending upon nation or region.

producer was Willys, a company with a 41 percent Brazilian shareholding not part of a large transnational. In Mexico, more than one third of the industry was in national hands(Jenkins, 1987: 62). By the early 1970s, the situation had changed dramatically as showing Table VI -4.

Table VI - 4

The Foreign Ownership in the Auto Industry in S. America(1972)

	Foreign Majority Owned Firms	Foreign Minority Firms	Locally Owned Firms
Argentina	97.3%	-	2.7%
Brazil	100.0	-	-
Chile	96.3	-	3.7
Columbia	44.9	55.1%	-
Mexico	84.6	6.5	8.9
Peru	77.2	22.8	-
Venezuela	67.4	3.2	29.4

(Source: Jenkins, 1987)

Explanations for differences in East Asian and Latin America development performances usually rely on differences in the relative autonomy of states, the organization of state bureaucracies and resulting effectiveness of national

industrial strategies(Jenkins, 1991)[148] However another critical difference between the East Asian development and that of Latin America, is the pattern of political-economical relations among developed and developing nations in the region. As was mentioned in the previous section, Korea has developed, following the leading goose, Japan, in the context of a regional division of labor. In the case of the Latin American bloc, the situation is fundamentally different from East Asia. Whereas the Japanese TNCs have assumed a role of lead geese for the following geese, Korean and the ASEAN firms, the U. S. and European TNCs in Latin America never took such a role at all.

In 1971, the Andean Pact was initiated by member states such as Columbia, Peru, and Venezuela, whose industrial developments are behind those of Latin American NICs such as Mexico and Brazil. The Andean Pact required TNCs to cooperate with one another in the cross border exchange of locally produced components within a regional division of labor. The Andean Pact strategy failed because the regional import substitution strategy initiated by the Andean Pact countries clashed with the global integration strategies preferred by U. S. and European TNCs to the detriment of the regional effort. The main thrust of the auto TNCs' strategy has been directed to international integration on a far wider scale than the regional market constituted by the Andean Pact(Jenkins, 1987:

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[148]Also, see Chapter III of this dissertation.

198 - 204). The Latin American economic bloc failed to realize the regional economic cooperation like that of the East Asia. Unlike the Japanese companies, the TNCs in Latin America did not take the role of leading geese. The Mexican and Brazilian firms, which occupy the middle ground in the Latin American economic region, have not played the role of flying geese in the middle like the Korean auto firms in the Asian automobile industry(Hill and Lee, 1993).[149]

The Japanese TNCs have been more willing than the European and U. S. TNCs to accept minority equity relations, to transfer appropriate technology, and to generally work within the framework of developing country policies. Japan's Mitsubishi Motor Company has worked in a minority equity relationship with Hyundai in Korea, and with the Malaysian government on its national car program, the Saga Proton. Because the regional division of labor in the East Asia is organized within each TNC's production system, it does not depend upon the kind of cooperation among TNCs that proved fatal in the Andean Pact case(Hill and Lee, 1993). The regional economic structure seems most responsible for the remarkable difference in performance between Korean automobile industry and that of the Latin American NICs.

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[149]Mexico may be starting to do this with Chile.

Chapter VII. Conclusions

1. Summary

In the introduction of this dissertation, I raised three major research questions as follows. (1) How did the Korean auto firms come to be incorporated into the international division of labor? (2) how did the Korean automakers maintain their equity ownership and managerial rights participating in the international division of labor? (3) How did the Korean auto firms catch up with the TNCs in technological know-how?

In order to answer these research questions, the development of the Korean automobile industry was analyzed from a micro perspective as well as a macro-perspective. From the micro-perspective, state role, institutional structure, and domestic economic conditions were analyzed. By the macro-perspective, geopolitical structure and the world economic conditions were analyzed. Moreover, state role, institutional structure, and geopolitical structure were investigated in historical context.

The intense competition between the Japanese auto firms and the U. S. automakers, the high labor productivity and low labor costs of the Korean automakers, and the favorable Korean economic conditions resulted in the international division of labor between the Korean Big Three and the TNCs in the 1980s. While the Korean automakers were able to get upgraded technologies and financial resources(foreign exchange) from

their international partners, the TNCs could buy low-cost cars(the LeMans for Pontiac, the Festiva for Ford, and the Excel for Mitsubishi) and low-end components, sell high-end components, and obtain licensing fees from the Korean automakers. Thus, the international division of labor between the Korean automakers and the TNCs were mutually beneficial to the both parties.

The low-pricing was the most important international strategy for the Korean automakers. They could afford to set the low prices for their cars in the international markets due to the low production costs and the low profit margins.

The performances of the Korean auto firms through the international division of labor are different markedly from one another. Hyundai Motor Company, the best performer, has sustained strong bargaining leverage over its international partner due to the multiple technology sources and indigenous managerial prerogative. Hyundai could control the international distribution channels completely. Kia Motor Company, the second best performer, maintained indigenous ownership and managerial right. However, it failed to diversify technology sources and to control the international distribution channels. Thus, Kia came to have weak bargaining leverage over its international partners. Daewoo Motor Company, the worst performer, could not sustain its managerial rights. It also had very few technology sources. Therefore, Daewoo had very weak bargaining power in the international

division of labor. Its international strategies were controlled by its international partner -- General Motors. These comparisons indicate that the relationship with international partners and international strategies are fully responsible for the business performances of Korean automakers.

Hyundai Motor Company belongs to the Hyundai Group, which is the biggest Chaebol in South Korea. Thus, Hyundai Motor Company was able to draw huge amount of funds within the broader Hyundai Group. Hyundai Group is the largest share holder for Hyundai Motor Company. The international division of labor with Mitsubishi Motor Company allowed Mitsubishi to own 12.6 percent of Hyundai Motor Company. However, Mitsubishi was totally excluded from managerial rights by the agreement between Hyundai and Mitsubishi. In this process, Hyundai Motor Company succeeded in maintaining managerial prerogative, while it participated in the international division of labor.

The equity share of Kia Motor Company is dispersed significantly. Kia has been controlled by professional managers since 1980, thus making Kia one of the first companies to divorce management from capital. Kia allowed Ford, Mazda, and C. Itoh & Co. to partially own Kia Motor Company. However, like the case of Hyundai, the foreign partners were not allowed to have managerial rights, and to own more than 10 percent of Kia Motor Company by the agreement. Thus, Kia Motor Company could sustain its

managerial right and indigenous ownership despite its participation in the international division of labor.

Daewoo Motor Company was 50 percent owned by General Motors, and Daewoo relied heavily on General Motors and Opel for technology. Therefore, General Motors came to have stronger bargaining power than Daewoo Corporation(the Korean Partner) despite the equal footing in terms of equity. In this context, Daewoo Corporation was not able to sustain managerial rights for Daewoo Motor Company.

The Korean automakers have improve their technologies through licensing and self-development. Above all, the international partners of the Korean automakers were major sources for the upgraded technologies. In fact, the major motivation of the Korean automakers to enter the international division of labor was the acquisition of the upgraded technologies from the TNCs. The Korean auto firms attempted to adopt the advanced production system in the 1980s. However, they were not able to achieve a flexible manufacturing system. At best, they introduced those new process technologies which enabled an increase in production efficiency in the context of a mass production system. The Korean automakers could not succeed in adopting the JIT system because of the inadequate production control computer system, the lack of the systematic suppliers network, and low-quality performance of the suppliers. Thus, the Korean Big Three failed to develop a sufficiently efficient production system to offset the effects

of the rapid wage rise in the late 1980s. As a consequence, Korean automakers lost international competitiveness.

2. Concluding Remarks

The theory of the regional division of labor based on the product cycle(flying geese model) works very well in the case of the Korean automobile industry.[150] In the case of Hyundai and Kia, their involvement in the international division of labor can be better understood by the broad picture of the regional division of labor in East Asia. The technology transfer in these auto firms has been made by way of the international division of labor. The technologies have flowed from the Japanese partners to the Korean automakers through the ladder of the product cycle. For instance, the technology for Hyundai's Excel came from Mitsubishi's old Mirage Model, and that of Kia's Festiva from the old model of Mazda 121. As the Japanese automakers develop new technology, they are willing to transfer old technology to the Korean partners. The Korean automakers(Hyundai and Kia), as flying geese in the middle, have been following the Japanese counterparts, the flying geese in the leading position.

The product cycle dynamism in the East Asia has evolved over the course of a century. Characteristics of government and the institutional structures as well as physical

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[150]The flying geeese theory is most persuasive in explaining the development of the Korean autombile industry against a dependency paradigm(Bello and Rosenfeld) and a sophisticated modernization perspective(Amsden).

technologies have been transferred from Japan to Korea.[151] Korea's Chaebol and the developmental state have been formed in the context of the regional economic structure.[152] The active Korean state and the mechanism of the Chaebol played a critical role in the development of the Korean automobile industry.[153] As a matter of fact, even these internal structures in Korea have been established by the influence of the external dynamics of the regional political economy.[154]

As was mentioned in the Chapter VI, explanations for differences between the Korean automobile industry and that of Latin America rely on differences of the regional economic structure. In the case of the Latin American automobile industry, TNCs have never been leading geese. Rather, they required majority equity relations, and they were unwilling to work within the framework of the policies of the Latin

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[151]The features of the Korean government and the business settings are legacies of the Japanese colonial rule(1910 - 1945).

[152]Although the Korean institutional structure has been developed by the Japanese influence, Korea's Chaebol is quite different from Japan's Keiretsu(For details, please see Chapter III.).

[153]The Korean government has established and imposed guide lines on foreign equity, technology transfer, raw materials provision, and sectoral allocations of foreign capital(Donner, 1992: 415).

[154]The distinct geopolitical structrure in the East Asia emerged in the early 20th century. Korea, as a middle ground country, developed its industrial structures and institutional structures, following the leading country, Japan. Thus, the internal structures in Korea are the products of the regional division of labor in the East Asian in the early 20th century.

American countries.[155] Unlike the Japanese automakers, TNCs in Latin America have contributed little to the industrial development of the regional economy.

Within the Korean automobile industry, the difference in business performance between Hyundai Motor Company and Daewoo Motor Company also demonstrates the validity of regional division of labor argument. Hyundai Motor Company could benefit from the regional division of labor. Mitsubishi Motor company, acting, as a lead goose, assisted Hyundai through the product cycle dynamics. However, Daewoo Motor Company has never been involved in the regional division of labor in the East Asia. Its international partner, General Motors, acted like the TNCs in Latin America. GM was unwilling to accept minority equity relation, and it took 50 percent share of Daewoo Motor Company. The global strategies of General Motors have been in conflict with the local interests of Daewoo Motor Company. Thus, General Motors did not play as a lead goose for Daewoo Motor Company. Kia Motor Company, the second best performer among the Korean Big Three, was also able to follow a lead goose, Mazda. Kia has improved its technological

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[155]For instance, Andean Pact in South America required the auto TNCs to cooperate one another in the cross border exchange of locally produced components within a regional division of labor. The TNCs were unwilling to work with the local framework. Rather, the main thrust of the auto TNCs' strategy has been directed to international integration on a far wider scale than the regional market constituted by the Andean Pact(Jenkins, 1987: 203). As far as the equity, the auto TNCs in Latin America came to have majority ownership in the automakers in Latin America(Jenkins, 1987: 62; Please see, Table VI - 4).

capability, ascending the product cycle ladder led by Mazda.[156] The business performances of the Korean automakers significantly depend upon whether they participate in the regional division of labor or not.

The theory of the regional division of labor in the East Asia can be also employed in explaining the limitations of the Korean automobile industry. Although Hyundai and Kia have made remarkable technological progress, they still possess the old technologies which are behind the Japanese by one generation because they have followed the Japanese lead along the product life cycle. In fact, Kia and Hyundai have been exporting cars which are old Japanese models.

Because of the emergence of new technologies, the automobile industry reversed the evolution toward maturity in the product cycle(Clark, 1983). The world automobile industry is expected to keep upgrading its product technologies. As long as the Korean automakers stay under the Japanese umbrella, they will continue to obtain second-class product technologies[157], which will be transferred from the Japanese automakers that are the technological frontiers in the world.

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[156]The technology tie between the Korean automakers and the Japanese partners substantially imroved technical ability of the Korean auto firms which are about to realize technological independence in the context of the regional division of labor or product cycle dynamics. In contrast, the technology tie between Daewoo Motor Company and General Motors did not enable Daewoo to break out of its technology dependence.

[157]This limitation comes from the product cycle dynamics in the East Asian automobile industry.

In the 1980s, the Korean automakers failed to adopt the flexible production system which is the new production mode. The lack of systematic suppliers network and organizational innovations are crucially responsible for their failure.[158] In addition, the inadequate computer facilities of the Korean automakers prevent them from achieving flexible manufacturing.[159]

The domestic and world economic conditions have affected the Korean automobile industry significantly. However, these effects did not last long. For instance, the favorable Korean economic conditions and the appreciation of the yen boosted the exports of the Korean automakers in the mid 1980s. But, these effects lasted for only three years. The Korean automobile industry began to stagnate in the late 1980s. In 1993, the Korean automobile industry began to boost exports again, responding to the favorable domestic economic conditions.

These economic conditions can explain only the short-term dynamics of the Korean automobile industry. The persistent effects of the Korean automobile industry have come from the regional economic structure. The product cycle dynamics

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[158]The failure of the adoption of the flexible manufacturing system by the Korean automakers resulted from the inefficient internal factors such as no intimate social reltions between assembler and suppliers rather than the external factors such as product cycle dynamics.

[159]The Korean automakers should have secured the appropriate process equipments for the flexible manufacturing system.

explain the development process of the Korean automobile industry and predict its future long run direction. Daewoo Motor Company is expected to forge an alliance with Honda in the near future. Thus, all the Korean Big Three companies will participate in the East Asian regional division of labor. Recently, the Korean automakers, as senior partners, began to work with the automakers of the ASEAN countries. In the 1990s, the regional division of labor in the East Asian automobile industry will be intensified.

The case of the Korean automobile industry illustrates how the regional economic structure and the role of the TNCs in the regional economy affect the industrial development of NICs. The product cycle theory can be also applied to other industries such as the electronics industry in East Asia. The Korean electronics industry is a world-class competitor. Like the automobile industry, the Japanese electronics companies are major technology sources for the Korean companies. Japan's Fanuc has been transferring welding robot technology to Korea's Daewoo Heavy Industry, and Hitachi made an agreement with Daewoo Electronics for the technology transfer of automotive audio production. Toshiba is transferring all prototyping, development and production of low-end products to its Korean partner, Samsung Electronics, so the Japanese company can concentrate resources on high-end models. The regional division of labor in the electronics industry

involves vertical and horizontal divisions of labor.[160] Originally confined to labor-intensive steps of manufacturing or final processing and assembly, these industries are now performing integrated local production or supplying products on an OEM basis(Yamada, 1990).

The Korean electronics companies are heavily dependent on Japanese counterparts for many high-tech parts. A study by the Hana Research Institute in Seoul concludes that Korea has attained only 80 percent of Japan's technology level in electronics(Nakarmi, 1993). As the case of the automobile industry, the Korean electronics industry has improved its technological capability through technology transfer from the Japanese partners. But the Korean electronics companies also remain behind the Japanese counterparts due to the product cycle dynamics and for other reasons.[161]

The remarkable industrial development of the Four Tiger countries and ASEAN must be understood by the dynamics of the whole regional economy and the leading role of the Japanese

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[160]In the case of the Japanese electronics industry as leading geese, the overseas demand is served by local factories, which procure a great percentage of their parts locally, while the home demand is served by industries that concentrate on achieving higher-added value(Yamada, 1990: 56).

[161]There are "a host of problems facing the Asian NICs that must be solved before further industrialization and greater structual sophistication can take place. These include the infrastructure bottlenecks that accompany rapid industrialization, declining competitive advantages due to more expensive labor costs and soaring exchange rates, the weakness of the technological base due to dependence on imports for high-tech components, and unrealized growth potential due to insufficient research and development"(Yamada, 1990: 53).

TNCs in regional industrial development. These characteristics in the East Asian economic bloc highly differentiate the industrial development of Asia from other NICs.[162]

[162]Amsden explains Korea's rapid industrialization by analyzing only domestic institutional factors. However, She missed the most important points -- the dynamics of the whole regional economy and the leading role of the Japanese TNCs in the Asian economic bloc. Amsden predicted that Korea would be Asia's Next Giant. Her prediction failed because she never considered the dynamics of the East Asian economy. Amsden never realized that Korea is a goose flying in the middle in the context of the East Asian economic bloc.

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