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DIFFERENCES IN THE ECONOMIC DEVELOPMENT OF SOUTH KOREA AND TAIWAN 1960 - 1988

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ABSTRACT

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Despite worldwide economic slowdown, South Korea and Taiwan achieved remarkable growth during the 1980s. They both began industrialization under similar conditions, pursued similar development strategies, and used government intervention to help achieve goals.

In spite of these similarities, in managing their respective economic affairs, one important difference existed in the growth pattern between these two countries. In Taiwan, the phase of economic management was fairly uniform throughout 1960 -1988, while in South Korea there were two distinctive phases. The government of South Korea played a large role in the economy during the 1960s and 1970s, but since then it has shifted to relying more on market forces.

To investigate the implication of this managing policy change on South Korea's economy, as well as make a comparison of the differences in the growth path of the GNP between the two, this study relates the index of Coefficient of Variation, derived from sequences of GNP, to the fluctuations in the growth pattern of both countries. Policy intervention can help government reach certain development goals. However, as market conditions change, policy intervention can become counterproductive or obsolete in economic restructuring and adjustment; it can be accompanied by undesirable distortions and imbalances

which affect growth and economic stability.

Macroeconomic performance has improved in South Korea since market forces have been given more play. In the early period of industrialization, Taiwan used state controls to a smaller degree. However, Taiwan's performance has deteriorated during the 1980s relative to its past because the government failed to liberalize as much as it should have. This may be one reason for Taiwan's slower growth compared to South Korea's since the early 1980s. Political and other factors unique to each country help explain these differences.

As a manifestation of the extent of government's involvement in economic policy, the machine tools industry is investigated as a special case study to compare the role played by each of the two countries. This study is also concerned with policy instruments used in developing various strategic industries.

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CHAPTER ONE

INTRODUCTION

The success story of the East Asian Newly Industrializing Countries (NICs) --South Korea, Taiwan, Singapore, and Hong Kong-- is well known. In all four countries there are similarities and differences in the economic development process; these are especially evident in a comparison of South Korea and Taiwan, the focus of this study. Each has maintained an average growth rate in GNP of more than 7 percent, and they share other characteristics. Among these are a high and rising ratio of exports to GDP, continuing increases in the ratio of manufactures to total exports, and a highly dynamic private entrepreneurial class.

Both the South Korean and Taiwanese governments are known to be interventionists in the economy, but South Korea entered a new phase in the 1980s by taking major strides toward a market economy. In some important ways, this change set the two countries apart. The difference is reflected by the fact that Taiwan's average growth during the 1960s and 1970s was more stable than that of South Korea, whereas the average growth of South Korea was more stable than that of Taiwan during the 1980s, although both had fairly comparable average growth rates over the whole period.

One purpose of this study is to examine this major change and its implication for the economic performance of Taiwan and South Korea after the 1960s. Some possible causes for the change also will be given. There were not only major differences in macroeconomic performance between the two countries but also contrasting features within the South Korean economy. This study attempts to explain these differences by relating the managing of government policy to each country's transition process.

1.1. A Brief Review of the South Korean and Taiwanese Economies

There can be no doubt that Taiwan and South Korea have experienced economic success. The great majority of books and articles celebrates their success as evidence of the working of market forces (P.W. Kuznets, 1977; Balassa, 1990). This conventional wisdom somehow misrepresented the countries' actual experiences. The growth and industrial transformation of their respective economies were largely the result of highly centralized planning as well as effective direction of economic activity by the state governments. Both governments set up the market conditions in which the economy would operate and become involved in economic activities parallel to (and sometimes in lieu of) the private sector. In both cases government has played an important and, in some respects, overwhelming role in the economy.

The dominant role of government was especially being felt by South Korea under the regime of Park Chung Hee (1961-1979), who was known as being an

active and pervasive interventionist. Policy management in the 1970s in South Korea can be characterized as promoting heavy and chemical manufacturing industries, accompanied by protectionism, mobilization of foreign saving or external borrowing, and overall control of fund allocation through policy loans or low interest rate credits for preferred sectors. This can be labeled an intervention for growth policy.

The emphasis on heavy and chemical industries (HCI) in the 1970s was part of South Korea's overall development: steel, autos, ships, and synthetic textiles from the petrochemical industry were produced mostly for export. The new program was intended to enhance self-reliance rather than deepen the dependency created by the light industrial export program of the 1960s. The HCI drive spurred a dramatic and ultimately inflationary investment boom in the late 1970s (Kuznets, 1982; Korea Exchange Bank, 1980). The bias toward HCI also drained investment resources from the light manufacturing sector, which remained central to the country's export success. Poor planning, bottlenecks, and insufficient demand resulted in surplus capacity in a number of designated heavy industries. These economic costs of rapid growth caused the social unrest in the late 1970s that resulted in the assassination of Park on October 29, 1979, and Chun Doo Hwan's power grab in 1980.

A major difference between Taiwan and South Korea lies in the degree of business concentration in each country. South Korea is dominated by the chaebols, large conglomerates patterned after the Japanese Zaibatsus. In

contrast, Taiwan has literally hundreds of thousands of independent enterprises, all competing with one another. The large industrial enterprises in Taiwan do not come close to the size of those in South Korea. The high concentration in South Korea is due partly to the efforts of economic planners to achieve economies of scale. The rapid rise in big business finds its origins in the none too delicate nexus of the government, banks, and business. The government formulated economic plans, and business was induced through a carrot-and-stick approach to carry these plans out and to meet the quantitative targets set by government. Two corollaries to the rapid expansion of the chaebols are (a) the excessively high financial leverage and (b) the inadequacy of profitability, of the firms. A peculiar income tax system and frequent government bailout of ailing large firms had been cited as key factors contributing to this extreme financial leverage.

Taiwanese policy also differed from South Korea's in terms of foreign direct investment. Taiwan maintained a more open posture toward foreign firms, encouraging them to export and to establish links with local parts and components producers as a means of developing new sectors. Unlike South Korea, where nationalism promoted an arm's-length relationship with foreign firms and a greater reliance on licensing financed through credit and loans, Taiwan seemed comfortable overall with its stronger reliance on foreign investment as a means to secure technology. South Korea was much more restrictive in controlling foreign multinational corporations. Foreign capital inflows took the form of extensive commercial borrowing, which was then channelled to finance leading national

firms.

1.2. The Machine Tool Industry

As a manifestation of government's intervention, the machine tool industry is investigated as a case study to demonstrate the scope and nature of each of the government's involvement in their respective economies. The importance of the machine tool industry lies in its role as supplier of the quality and quantity of machinery needed by the engineering industries, which, in turn, are vital to a country's economic and industrial development. Of equal importance is the part played by the machine tool industry in generating and diffusing new production technology, and, for this reason, it is of central concern to governments in many developed countries as well as Newly Industrialized Countries (NICs). Both governments of South Korea and Taiwan have designed the machine tool industry as one of the strategic industries for the development of future industrialization. In this study, special attention is given to the producers of lathes, which are not only the single most important machine tool but also represent one of the few areas in which countries such as South Korea and Taiwan have made some inroads into developed country markets.

Radical technological change has given rise to computer numerical-controlled (CNC) lathes. Due to their advantages over conventional lathes, many Taiwanese and South Korean manufacturers have switched to production of CNC lathes. The switch is not easy, however, because the technology is much more

complex than that of conventional lathes. The governments of both Taiwan and South Korea have designed specific policies for the machine tool industry. The Korean policy has been in operation for some time, and Taiwan initiated one later in 1982. Among others, the policy instruments in use by South Korea are import restrictions and credit policies.

1.3. Policy Reforms

Despite impressive growth in Taiwan and South Korea since the late 1970s, critics within and outside the two countries have pointed to the distortions that have accompanied government intervention and have begun to question the utility of state-led economic policy. These reformers argue that less government regulation and guidance is one of the best ways to cope with the new economic challenges facing both countries. In addition, over the past decade South Korea has confronted serious domestic problems--the debt crisis and the internal political and social unrest after the assassination of President Park. Nevertheless, in 1981 the new regime began to pursue a more market-oriented style of economic management and set South Korea on a more market-oriented course, one that is away from the heavy government intervention of the previous regime.

1.4. The Plan of Study

In chapter 2 coefficient of variation (CV) is introduced as a proxy for the stability of GNP growth in each country. The focus of Chapter 3 is the intervention

of South Korea Government during the 1960s and 1970s. It also includes drive to promote heavy and chemical industries in South Korea and its legacy. In Chapter 4 the differences in business concentration in South Korea and Taiwan are examined. The subject of Chapter 5 is differences between the two countries in terms of handling multinational corporations and foreign investment. Chapter 6 is concentrated on the machine tool industry in Taiwan and South Korea. The policy reforms of the 1980s and their implications of each country are discussed in Chapter 7. Conclusions are presented in Chapter 8.

CHAPTER TWO

GROSS NATIONAL PRODUCT AND THE COEFFICIENT OF VARIATION: GROWTH AND STABILITY

In their progress toward economic development, South Korea and Taiwan share certain characteristics. Both have realized rapid real economic growth and expansion in manufacturing exports. Each has maintained an annual average growth rate in real GNP higher than 7.5 percent during the entire period (Hwang, Y.D, 1991). These impressive indicators are well-known and suggest some similarity in the development experience.

Not so well known are several macroeconomic indicators that reveal significant differences between the two countries. Table 2-1 shows that, as of 1986, there were some major contrasts in macroeconomic performance, such as per capita income. The ratio of the value of exports to the value of imports also differs (1.64 for Taiwan, 1.09 for South Korea).

Furthermore, per capita exports in Taiwan as of 1986 were U.S. $2,045 compared to U.S. $835 in Korea, or less than half of that in Taiwan. This fact, together with Taiwan's much higher per capita income (despite the higher population density), implies that industrialization in Taiwan has been more effective

(Bank of Korea, 1986).

Table 2-1 Comparative Data on South Korea and Taiwan, 1986

Description	South Korea	Taiwan
1. Total population (000s)[a]	41,569	19,455
2. Total national land area (km^2)	99,117	36,000
3. Per capita income (U. S. $)	2,296	3,748
4. Value of export (million U.S.$)	34,715	39,789
5. Value of import (million U.5. $	31,584	24,165
6. Ratio of value of exports/imports (5)/(6)	1.09	1.64

Sources: For Korea: Bank of Korea, Economic Statistics Yearbook, 1986, and Monthly Bulletin, April 1987, pp. 92.
For Taiwan: Council for Economic Planning and Development, Executive Yuan, Republic of China, Industry of Free China, March 1987.
[a] As of December 31, 1984.

2.1. The Coefficient of Variation

To sort out complex correlation and causation morphologically, outcomes of economic theory may be viewed as a function of various socio-economical variables. By converting those common elements into parameters, and expressing the dependent variable with respect to independent variables, one could conceivably ascertain the effects of such operative variables as the state's role and development policies on the mechanisms and outcomes of a country's development.

As defined in elementary statistical textbooks, the standard deviation is an absolute measure of dispersion. The coefficient of variation can be obtained by expressing the standard deviation as a percentage of the arithmetic mean, and it

measures dispersion about the mean. That is, mathematically,

$$CV = \frac{S}{\bar{X}}$$

Where S = *Standard deviation*

$$= \sqrt{\frac{\sum (X-\bar{X})^2}{n}} ,$$

and

$\bar{X}$ = *Arithmatic means*

Following the above simple method of statistic calculation, if stability of the economic growth path is allowed to stand proxy as outcomes of development, the coefficient of variation, derived from the GNP numbers, may be viewed as a function of the state's role and intervention policies in the development process of industrialization.

Although not a very perfect and ideal measurement for economic outcome, GNP still represents an important and common criteria in evaluating a country's growth path. Since coefficient of variation is a measure of dispersion about the mean and if reducing the variance of the growth rate of GNP is important, the lower the coefficient, the greater the stability of the economic growth. In addition, being a relative measure, CV may be used as a number for comparison to assess

the differences in growth patterns among different countries.

A major difference between Taiwan and South Korea is the stability in the rate of growth of real GNP. As shown in Table 2-2, the growth performance of both has been excellent. During the 1960s and 1970s, the GNP in Taiwan had grown faster than the average in Korea (9.7 versus 8.2 percent). Taiwan's performance in terms of stability of the growth rate also was superlative, indicated by the lower CV (31.97 versus 49.91). As one might speculate, a stable growth path implies much about an economy's character, including an absence of bottlenecks and other serious constraints. It also implies a relatively balanced economy with no extreme fluctuation in prices. These virtues, in turn, reflect the underlying development policies implemented by the individual countries that are being studied.

Table 2-2 Gross National Product and Coefficient of Variation, South Korea and Taiwan, with Outlier

	Average Annual Growth Rate	Coefficient of Variation
Korea		
1961-1980	8.20	49.91%
1981-1988	10.03	28.20%
Taiwan		
1960-1979	9.70	31.97%
1980-1987	8.42	36.39%

Note: The outlier is defined as the year for which the rate of growth of GNP was far out of trend. For South Korea 1980 was the outlier; for Taiwan, it was 1974.

Data Sources: Bank of Korea, Economic Statistics Yearbook, various issues; Economic Planing Board, Major Statistics of Korean Economics, 1990 (Seoul, 1990).
Central Bank of China, Financial Statistics Monthly, various issues and Council for Economic Planning and Development, Taiwan Statistical Data Book, 1991
Source: Calculated by the author

Table 2-3 Gross National Product and Coefficient of Variation, South Korea and Taiwan, without Outlier

	Average Annual Growth Rate	Coefficient of Variation
Korea		
1961-1979	8.80	35.58%
1981-1988	10.30	28.20%
Taiwan		
1960-1979	10.15	25.69%
1980-1987	8.42	36.39%

Note: The difference between Table 2-2 and Table 2-3 is that Table 2-2 includes the outlier and the other does not include the outlier. The purpose of displaying two sets of numbers is to see how much the outlier distorts the coefficients of variation. However the trend is consistent from both tables.
Source: Calculated by the author

Both growth and stability are influenced by government policy in monetary and fiscal areas, among others. K.T. Li, a chief architect of Taiwan's macroeconomic polices in the postwar period, has described the relationship between growth and stability in Taiwan: "during the 1950's the overriding economic consideration was stability." (Li 1988, p.10) In the 1970s, "every thing possible was done to maintain price stability, even if it required being less mindful of the growth rate." (Li, 1988, p.15)

Throughout 1980-1987, however, growth rates in Taiwan seemed to slow. The overall rate of growth in GNP increased relatively slower than that of Korea (8.42 versus 10.03 percent), and its growth of GNP became erratic. As indicated in Table 2-2 and Table 2-3, this instability increased and surpassed that of Korea (36.39 versus 28.20). The increased instability trend represented by the CV is apparent in both tables with or without the outlier year. In the following chapters, some explanation will be given for the fluctuation both within and between the two countries.

2.2. The Role of Government in the Development of South Korea and Taiwan

South Korea and Taiwan began industrialization on more or less the same footing. Both were colonized by Japan until the end of World War II. The legacy of a strong administrative culture left by the Japanese in both countries is very important, as effective implementation is lacking in many countries when they began the industrialization process. Another similarity is that the special requirements of economic development and national security for both Taiwan and South Korea have been used recurrently to justify and legitimize what Korean President Park euphemistically labelled "administrative politics."

In both cases, industrialization strategy shifted from "import substitution" to "export promotion" around 1960. Both Taiwan and South Korea terminated the import substitution growth phase after practicing it for a short period (slightly more than ten years). Both switched to the external orientation phase of development,

based on the export of labor-intensive manufactured goods as the primary driver of growth. Nevertheless, there are major differences in terms of political economy between the two countries, resulting in the unique style of each in implementing economic policy.

2.2.1. Taiwan

Taiwan's political leadership had long experience with economic management, and the presidencies of father and son -- Chiang Kai-Skek (1949-1975) and Chiang Chien-Kuo (1978-1987), spanning thirty-six years,-- epitomized the continuity of government policy under essentially the same regime. This continuity of strong leadership also might explain the high degree of cohesion within the Nationalist Government, which allowed it to play an effective role.[1]

As a result of historical experience in mainland China, the Taiwanese government tends to be conservative and is cautious in making and implementing economy policy. Concerned for the island's social and economic stability, Taiwan has shown a preference for constrained growth. Compared with South Korea, the scope of administrative controls was much more limited in Taiwan. To achieve stability, the government sometimes has shielded the economy as much as possible from market forces and at other times has allowed them to function freely (Amsden, 1992).

Before the 1990s, the sole ruling party for four decades was the Kuomintang (KMT). It stabilized Taiwan's economy in the 1950s by undertaking a path-

breaking interest rate reform. From then on Taiwan adopted a conservative monetary policy, unlike South Korea, and this helps explain partially why it has performed consistently better than South Korea in maintaining price stability. Taiwan's inflation was a low 2 percent annually during the 1960s. Monetary policy was not used to finance industrial plans, and, to this day, the conservative Ministry of Finance and the central bank remain extremely powerful. This same kind of conservatism influenced the other macroeconomic policy as well. Fiscally, Taiwan has been extremely cautious as reflected in persistent budget surpluses since 1965. Until the early 1980s, Taiwan largely shunned the use of the financial system as a way of expanding target industries (Cheng and Haggard, 1987).

2.2.2. South Korea

In contrast to Taiwan's relatively smooth path, Korean political history has alternated between democratic and authoritarian regimes, punctuated by acute political crises. Twice in the postwar period the military has intervened, but each time, it has failed to establish a successful ideological or organizational formula for its rule and has faced strong popular opposition (Cheng and Haggard, 1987). On May 16, 1961, a military coup brought Park Chung Hee to power for almost two decades. His assassination in October 1979 was followed by a brief political liberalization, then a military coup, and then replacement of the interim president by General Chun. The general obtained office through a coup d'etat and brutally crushed an uprising in the southern city of Kwangju.

In fostering export-led industrialization, South Korea has shown important differences from Taiwan in managing economic policy. During the first part of its industrialization, Korean economic experience was quite eventful. Indeed, economic development over the last three decades can roughly be classified into two stages. The first, 1961-1979, is coincident with the Park regime. This period was marked by high inflation, an accommodative monetary policy, unstable prices, and a low level of personal savings. The government became strongly committed to economic development and modernization, and its influence over economic affairs was much greater and more detailed as compared to Taiwan (Scitovsky, 1986). The machinery of economic planning became larger, more elaborate, and more prominently placed than previously in the Korean administrative hierarchy.

The second period, 1980-1988, is characterized by gradual diminution in government interference and a shift from the earlier planned economy towards one more market oriented. It began as a liberalization process to achieve stability in the hope of curing the economic and social ills of the 1960s and 1970s. Price stability, mobilization of domestic saving, and market allocation of resources and funds were the first priorities of economic reform. The government continued to be active but relinquished direct intervention in favor of indirect control over the economy. Furthermore, these indirect controls tended to be more selective and less intrusive than previously. There was also a great reduction in the number and nature of inducements used and in the forcefulness with which they were applied. Some of the most effective prior tools of South Korean intervention-- including

direct subsidies, preferential access to subsidized credit, extensive quantitative import restrictions, and high tariffs--were eliminated or reduced. By giving greater play to market functions, South Korea substantially improved its economic performance in terms of growth and stability, as evidenced by CV shown in Table 2-2. The striking feature of post war Korean history is the coincidence of economic and political "turning points".

2.3. Conclusion

Due to market failures and imperfect markets and other factors, contemporary experiences show that states in Less Developed Countries are usually being entrusted as balancing and correcting agents. This, in turn, gives justification for the states to initiate interventions. As detailed in the following chapters, both states in this study exercised effective interventions over their respective economies. Efforts were undertaken in both economies in order to strengthen the industrial base and to achieve maximum rates of economic growth. These strategies, indeed, caused rapid economic growth in these countries. However, most of the literature that celebrated the successes of East Asian NICs concentrated only on the acceleration aspect of the economic growth. Left unaddressed are quality, sustainability and stability of these growths, issues that manifested into fundamental problems in the form of substantial economic disorders and macroeconomic imbalances.

When the function of the state expands into detailed economic planning and

decision-making and becomes a substitute for the allocative and the creative functions of the market, the state mechanism would invariably overload with bureaucratic inefficiency, with outcomes often at variance with market solutions. In this comparison study, along with associated policies adopted by each country, economic performances of South Korea and Taiwan are analyzed in light of the changing (or unchanging) role played by each of the governments. Cost of distortions generated by allocation inefficiencies, both in terms of static and dynamic[2], is approximated by CV-- a number that measures dispersion around the GNP growth trend, as indicated in the Tables 2-2 and 2-3. Experiences of South Korea and Taiwan during the last three decades support the propositions that markets do relatively better, and that non-market failure outweighs market failure in general. As evidenced by the South Korean case, the failure of running the economy through non-market mechanism is more frequently and relatively severe, at least during the periods of the late 1970s and early 1980s. To the extent that policies "explain" the outcome of growth instability, the differences in performance of South Korean and Taiwanese economies have to be attributed mainly to the degree (or extensiveness) of policy intervention being adopted by each of the governments.

CHAPTER THREE

THE SOUTH KOREAN EXPERIENCE OF THE 1960S AND 1970S

In the 1960s and 1970s, the government of South Korea took a hands-on approach to economic management. Under the Rhee regime (1948-1960), the state had done little to stimulate the economy, and growth stagnated throughout most of the 1950s. On May 16, 1961, a military coup brought Park Chung Hee to power. This was going to change the complexion of Korean economics as no single internal event since the Japanese occupation of Korea in 1910. Perceived as lacking legitimacy, the new regime was determined to take a more active role in the national economy.

Beginning in 1962, new economic policies were put into effect through a series of five-year economic plans (1962-66, 1967-71, 1972-76, 1977-81, 1982-86, and 1987-91). Under the long reign of Park, from 1961-1979, most of the time the government ran a tight economic ship. Four five-year plans were launched during this period tailoring to the fluctuations of the domestic and international economies.[1] Insofar as state involvements are concerned, two periods may be identified. In the early 1960s, Park decided the thrust was nation building through exports. It was the "take-off" period during which various trade, (specific or

selective) interventions were initiated to create an export incentive regime. In the 1970s, a coordinated effort of heavy and chemical industries (HCI) drive was put into place. It was a time during which pervasive interventions were engaged to hasten changes in comparative advantage, for the sole purpose of achieving economic goals determined by the government.

Typically, the Korean export industry was undercapitalized because little capitalization was required to secure bank credit. Most of the firms' financing was supported with credit derived from government-owned or- controlled financial institutions. The below the market interest loan led the sector's heavy indebtedness to the government-controlled banking system resulting in increased government influence on private industry. External financing from foreign capital inflows was also under the state government's control. With both the cost and availability of credit being controlled by the state, the government was able to ensure that favored firms and activities would continue to receive access to credit at preferential prices. Credit policy and interest rates policy contributed to close ties between export-oriented industry and government. The state, it must be pointed out, encouraged this dependence by setting real interest rates that were either negative or close to zero.

3.1 The Early Industrialization Period in South Korea

From 1963 to 1972, South Korea was marked by an unprecedented growth; high export growth of labor-intensive light manufactures was a powerful engine for

the whole economy. During this period, the state adopted the so-call export-led strategy. This development strategy is based on the premise that as the engine of growth the expansion of exports could overcome the limitation of the domestic market with respect to economies of scale and efficiency of industrialization. The state assumed the initiative in the allocation of resources in favor of export-oriented industries and the industry competed effectively in the world market by specializing of labor-intensive products.

Intervention through government regulation was characteristic of this period. The interferences were most obvious in the factor markets, such as tariff, exchange rates and interest rates, rather than in the product markets. Within factor markets, financial markets were a major target (Kwon, 1990). One of the first acts of the military regime that came to power in 1961 was to nationalize the commercial banking system. By 1970 the government controlled an astounding 96.4 percent of the country's financial assets. It sold its shares in the commercial banks in 1983 but continued to maintain strong administrative controls (Bello and Rosenfeld, 1990). Mainly, the government used targeted lending through the state-owned banking system to support industrialization (Cheng and Haggard, 1987).

During this period, exporters were compensated for participating in the government's export-at-all-costs program by protectionism via tariff and non-tariff barriers. While exporters generally had access to needed inputs at world market prices, domestic industrial protection was extended to the very sectors in which

Korea was most successful as an exporter. Tariff exemption on imported materials as well as various assistance in marketing were given to exporters. Exchange rate policy was gradually introduced by a wide range of innovative export-promoting policies. Consequently, the currency, won, frequently became overvalued because of (a) higher domestic inflation over the world inflation rate and (b) the exchange rate was controlled by the government most of the time.

Besides the financial systems, the fiscal policy expanded dramatically and played a major role in mobilizing and allocating financial resources. Tax policy was also used to influence the behavior of chaebols. Exporters were exempted from the indirect tax on income earned from their export sales, and from 1961 to 1972 they enjoyed a 50 percent cut from the normal corporate and income tax levied on export earnings (Kwon, 1990). At the same time, tax audits constituted an extremely powerful threat that could be deployed against recalcitrant chaebols.

Provision of infrastructure services functioned in much the same double-edged fashion. In the 1970s the government set up industrial estates where export firms could purchase industrial sites at greatly discounted prices and were charged low fees for such services as electricity, water, transportation, and communication. But failure to meet export targets could provoke the disconnection of electricity on the orders of the Ministry of Trade and Industry (MITI) (Bello and Rosenfeld, 1990).

On the whole, from the 1960s until recently, Korea's export-promoting strategies were implemented in the context of widespread import barriers. As is

summarized in Table 3-1 a combination of export-promoting and import restraining policies were established by the government. First, a myriad of incentives were provided to make production for exports more profitable than production for the domestic market. Then, informal barriers and special laws were erected to limit some categories of trade. Consequently both economic structure and export performance were strongly affected by government intervention. Today, Koran industrial policy is still best known for some of these ambitious and sometime curious policies, although many were changed since the mid-1970s.

Table 3-1 Major Export-Promotion Schemes: Types of Incentives

Tax Incentives Schemes	Tariff Incentives	Financial Incentives	Other Promotions
1. Business tax based exemptions	1. Tariff exemptions on capital equipment for export production	1. Financing imports of materials to be used in export	1. Trading license on export performance
2. Reduction of income tax by 50% on earning from exports	2. Tariff exemptions on raw materials imports for export production	2. Financing suppliers of U.S. offshore military procurement	2. Payment of export subsidy
3. Accelerated depreciation on fixed capital directly related to export promotion	3. Wastage Allowance	3. Fund to promote export industry	3. Monopoly rights on exports of specific items to specific areas
4. Tax credit for foreign market development expenditures		4. Foreign currency loans	4. Creation of exporters associations on various export products

Source: Lim (1985).

During this period in Taiwan the government relied more on the workings of the free market forces. This is evident from Table 3-2 which provides comparative data on government support for manufacturing industry in 1969 in Taiwan and South Korea. The first column refers to the combined effects of protective measures, credit, and tax preferences on value added. This column is somewhat underscored the true degree of the state's support of South Korea because some incentives to manufacturing are not fully accounted for. In their attempts to stimulate exports both governments offered generous subsidies including subsidized long-term loans to targeted industries and firms. Since these tended to be greater in South Korea than in Taiwan, Table 3-2 probably understates the relative government support to the Korean manufacturing industry.

Table 3-2 Incentives to Industry in Taiwan and South Korea, 1969

	Effective Protection[a]	Domestic Sales	Foreign Sales[b]
All Industries			
Taiwan	5	2	16
Korea	10	10	9
Manufacturing			
Taiwan	19	24	23
Korea	-1	-9	12

Sources: Based on Amsden 1992, Table 2-15, p.45. According to the author, the table is based on estimates in Bela Balassa and Associates Development Strategies in Semi-Industrial Economies (Baltimore: John Hopkins University Press,1982).

a. The effective rate of protection relates the joint effects of protective measures

on the price of the product and the prices of its inputs to value added in the production process. The Balassa method of estimation has been used.
b. Total incentives relate the combined effect of protective measures and credit and tax preferences to value added. Credit generally relates to working capital rather than investment capital.

In the 1960s, Korea achieved a high rate of growth with a very dynamic export sector with access to imports at essentially world market prices by the exporters and a protected import competing sector whose growth was only limited by the small domestic market. Successful exporters received automatic access to rationed and heavily subsidized credit. As will be shown in the next section and the following chapter, the intervention of subsequent HCI episode further distorted credit allocation and raised industrial protection even more. This episode spawned the growth at all costs strategy of Korean firms, their excessive leveraging and the emergence of the chaebols. It also encouraged government to be involved in decision on market entry, technology and scale of operations of individual enterprises as well as industrial concentration.

3.2 The Heavy and Chemical Industries Program

Perhaps no other example better shows the extent of Korean government intervention than the heavy and chemical industries' (HCI) program, in the late 1970s. Industrial deepening was the strategic aim. Literally created from scratch, South Korea established new export industries that were expected to have a comparative advantage based on abundant skilled-labor. Such basic industries as iron and steel, petrochemicals, electronics, machinery, shipbuilding, and transport

equipment were chosen as strategic. Park and his technocrats sought to give more depth and integration to the economic structure as well as make the country less dependent on imports of key intermediate and basic goods (Cumings, 1984). The idea was to move from low valued-added labor-intensive exports to high valued-added capital or technology intensive exports.

3.2.1 Reasons for Adopting the HCI Program

Several important changes in the country's economic situation led to the shift from light to heavy and chemical industries. The first was the weakening of South Korea's comparative advantage, based on unskilled labor, in the face of growing competition from other less industrialized countries with even lower wage rates. The second reason was that some of the major traditional export industries in South Korea, such as plywood, were reaching the limits of their potential. Further expansion of these industries into the world market would be difficult or very costly. It also became impossible to expand export earnings from the traditional light industries, as required in the third economic plan (1972-76) (Scitovsky, 1986). Yet another reason behind the shift lies in the backward linkage effect of export expansion. The rapid growth of manufacturing goods created an equally rapid growth in demand for intermediary goods. During the first half of the 1960s, South Korea imported most intermediary goods, but between 1968 and 1971, some chemical and heavy industries (such as fiber spinning, textile fabrics, rubber products, chemicals, and iron and steel) began to produce intermediary

goods as substitutes for imports. Most investment in this area was made in medium-scale plants. HCI embodies the planner's belief that South Korea could achieve import substitution and export upgrading simultaneously by moving into an emerging niche in the world market for standardized capital and intermediate goods.

Finally, in addition to market forces, political factors had a significant influence on the adoption of the HCI program (Cheng and Haggard, 1987). Military considerations were an additional--and perhaps decisive-- motivation. The relationships between the U.S. and South Korea were strained by President Carter's intention to withdraw U.S. troops from the peninsula. Heavy industries would form the core of a new military-industrial complex capable of self-sufficiency in a number of weapons systems (U.S. Congress, 1978). In the end, the defense argument reinforced the economic reasoning, and South Korea took quite a different development route from that of Taiwan, at least from the mid-197Os.

3.2.2 The 1977-1979 Period

Implementation of the Heavy and Chemical Industry (HCI) program was delayed in the early 1970s by the first oil shock, but over the late 1970s it placed South Korea on a much more expansionist course (Korea Exchange Bank, 1980; Kim, 1980). The all-out drive occurred in the two years, 1977-79, when 80 percent of investment in manufacturing went to heavy industry (Cheng and Haggard, 1987). Expansion of heavy industries such as steel, shipbuilding, and automobiles

absorbed large amounts of capital, and investment's share of GNP jumped from 26 percent in 1976 to 37 percent in 1978 (Bello and Rosenfeld, 1990). To finance this feverish activity, South Korea resorted to massive borrowing; foreign debt soared from 2.2 billion in 1977 to 27.1 billion by 1980. Between 1977 and 1981, 45 percent of the financing of heavy and chemical industries came from abroad. The rest was siphoned from domestic savings through such mechanisms as the National Investment Fund, which absorbed employee pensions as well as a fixed portion of all bank deposits.

The rapid expansion of credit from the state-owned banking sector was supported by an accommodative monetary policy. Large inflows of foreign exchange from Middle East construction contracts also had an expansionary effect on the monetary base which authorities failed to neutralize, and inflation accelerated. The reduced availability of funds for traditional export industries was aggravated by the increasing overvaluation of the exchange rate. Despite domestic inflation rates in excess of world market rates, the exchange rate stayed constant at 484 won to the U.S. dollar from 1975 onward. As a result, between 1975 and 1979 the real exchange rate appreciated by 12 percent (Scitovsky 1986). Following ambitious investment programs in the heavy and chemical industries, import restrictions were also utilized to support this industrialization effort.

Breakneck expansion of HCI investments threw the economy into sharp disequilibrium as light industry was starved for capital. Production capacity surpassed demand in the HCI sectors (Balassa, 1990). The unusual high growth

of investment also put additional pressure on the labor market, particularly in the skilled occupational categories. Real wages increased sharply from 1976 to 1978 (Bello and Rosenfeld, 1990), outstripping productivity gains and contributing to an erosion of South Korea's competitiveness. In the second half of the 1970s, the government used the banking system both to finance directly and to guarantee foreign financing of investments in the heavy and chemical industries. Interest rate subsidies, together with favored access to credit, also led to excessive investment in these industries. By the end of 1979, however, when the downturn set in with huge idle capacities, the enterprises had difficulty servicing their debts, and the banks accumulated non-performing loans. When HCI exports were sent to the world market, they encountered a world recession exacerbated by the hike in oil prices in 1979 and the slow growth in world trade.

3.3 The Legacy of the HCI Program

The HCI program yielded an ambiguous legacy. On the one hand, it validated the strategy of making integrated national industrialization the core element of sustained economic development. As the Korean economy moved from recession to growth in the early 1980s, it became clear that the HCI program had transformed the country's economic structure. In the 1970s, heavy and chemical industrial exports accounted for only 12.8 percent of the total. By 1985, the export share of light industry had fallen from 69.6 percent to 37.5 percent (Bello and Rosenfeld, 1990). The shift in the development path altered the

industrial structure of South Korea to such an extent that the share of heavy and chemical industries in GDP, as well as in exports, rose much faster than in Taiwan. By the mid-1980s, the program had become the springboard from which the country launched its export offensive in the late 1980s. This became steadily more true as trade barriers were installed in industrialized countries in the late 1970s and early 1980s. Indeed, the resumption of high growth rates in the 1980s might have been impossible in South Korea without investment in accordance with the plan.

On the other hand, the policies applied in the late 1970s severely distorted credit allocation, heightened and broadened protection for domestic industries, and brought government directly into industrial decision-making. To pursue the basic economic strategy of expanding the scale of the economy as quickly as possible, manufacturing rather than agriculture, export industry rather than domestic industry, and large corporations rather than small ones received high priority. The HCI episode was achieved at substantial allocative cost, as well as increasing in economic inequality.

CHAPTER FOUR

BUSINESS CONCENTRATION IN TAIWAN AND SOUTH KOREA

A striking feature of South Korea's economy is the size of chaebols and the speed at which those conglomerates grew during early industrialization (the 1960s and 1970s). In 1982, 27 private firms based in Less Developed Countries made Fortune's lists of the 500 largest non-U.S.; ten of these companies were Korean (Scitovsky, 1986). Korea, a relatively small country with forty-one million people, has conglomerates that are large by any standard.

4.1. Korean Big Business

Most chaebols started out as small domestic firms less than a generation ago. For most of them, general trading companies (GTCs) and construction companies were their major business lines (Lee, 1990). They have expanded by diversifying into a wide range of business ventures, and they produce and export almost everything-- from wigs to automobiles. The four largest --Hyundai, Sam Sung, Daewoo, and Lucky--each had an annual gross turnover in the range of US $5 -$10 million in 1981 (Scitovsky, 1986). Even the smallest exceeded the gross

sales of Taiwan's ten largest companies combined (Scitovsky, 1986). Although the chaebols are modeled after the Japanese zaibatsu, their degree of market concentration is significantly greater than it is in Japan.[1] The twenty largest Korean conglomerates account for half the value added in manufacturing, a ratio considerably higher than in Japan or other East Asian NICs (Kwon, 1990).

4.2. Size, Industrial Organization, and Controls of Chaebols

In their rush to industrialization, state policy promoted the development of an economy dominated by large producers. Large size was considered by the bureaucrats as an ideal vehicle for carrying-out the government's plan of rapid expansion into new capital-intensive areas of production. This, in turn, would allow their products to compete in the lower end of numerous foreign markets, especially against products from Japanese business groups. To strengthen their ability to implement desired policies, state planners combined support for large scale production with limited market competition. Instead of letting firms operate in a competitive market structure, production itself was highly centralized and organized by a few large chaebols. Protected from foreign competition via import barriers and foreign direct investment restrictions, these chaebols each operated within their respective markets with an extraordinary degree of market control. Oligopoly was favored to become the dominate form of economic organization.

Under the Park regime, big businesses was explicitly or implicitly favored by placing resources in the hands of entrepreneurs who had demonstrated their

competitiveness in the international arena. Thanks mainly to the government's credit policy, the cost of credit to these firms was reduced through preferential interest rates. Recognizing that its control over the price and allocation of credit could be undermined by international capital flows, the government also amended the Foreign Capital Inducement Law in 1962 to require that all foreign loans be approved and guaranteed by the government. While this measure responded to foreign demands for insurance against possible default, it further gave the government the ability to decide which enterprises would have access to foreign capital. Since the state controlled all access to internal and external credit, use of credit allocation or policy loans proved to be an effective method to keep the large industrial organizations under the government's control. The relationship between the government and large business firms can be characterized as a principal agency relationship. The government acted as a principal body in designing economic plans, and the businesses acted as agents for executing the plans and meeting the targets. Government, however, has held the upper hand in this alliance, at least during the 1960s and 1970s.

4.3. Industry Targeting and Corporation Investment Decisions

The belief that government has better vision to assess investment projects places the government in a more advantageous position to make plans than the private sector. In South Korea, instead of the market mechanism allocating resources and guiding private entrepreneurship, during the 1970s the government

made most of the pivotal investment decisions through development of target industries. The Korean government regularly targeted new areas for development by encouraging the establishment of domestic firms to replace imports. These new firms, most of them chaebols, were protected by both trade restrictions and strict limits on foreign direct investment and, when judged capable, were required to export as well as meet domestic needs. The control over both the allocation and cost of capital gave government planners the ability to direct firm activity into areas considered strategic for industrial development, often allowing them to assume both market and enterprise functions in the process. At the same time, by guaranteeing a stable source of funding for firms undertaking targeted activities, the government was able to greatly reduce the risk associated with new ventures. By subsidizing the price of credit, the government was able to reduce significantly the cost of investment and thus increase the expected rate of return for the targeted activity. Major investment decisions of corporations in targeted industries were basically guided by the government's iron hand rather than by free market competitive entrepreneurship.

The government could not, however, avoid side effects of its policy. This form of industrial targeting is often inefficient because, for one thing, it is very difficult to identify ex ante the would-be winners. In the process not only government may pick the wrong industry but also it may run the risk of promoting the targeted industry too quickly, as experienced through the HCI program of the 1970s. As at the end of HCI era, part of the HCI program ran into serious trouble;

many large industrial facilities went under-utilized for years after completion; others, were eventually closed. The over-built new industries proved unable to meet the government's ambitious export targets; meanwhile, the traditional export earning sector, light manufacturing, lost its international competitiveness. The utility ratio of machine tool industry, for example, as being one of the sub-sector of machinery sector, fell from 74 percent in late 1977 to 35 percent by late 1980 (World Development, 1988). When the economy began to slow in 1979, over-investment greatly added to the chaebol's financial burden and the economy's instability.

4.4. Financial Leverage Of Korean Manufacturing Enterprises and Its Implications

As mentioned above, the quickly-expanded and highly-leveraged Korean firms can be traced to the direct support and acquiescence of the government. Two corollaries to the rapid expansion of chaebols are (a) excessive corporate financial leverage with high debt equity ratios, and (b) inadequate emphasis on corporate profitability as will be detailed in this section.

According to a study done by Kim (1990), from 1972 through 1981 the sum of the current and fixed liabilities of Korean manufacturing enterprises expressed as a percentage of their net worth (that is, debt/ stockholders' ratio) was 364 percent--more than in Taiwan, and four times as high as in the United States. Furthermore, when financial leverage is properly measured for Korean corporations, the results show that the average equity ratio for all nonfinancial firms

listed on the Korean Stock Exchange was 16 percent from 1977 through 1986 (Kim, 1990). This is in sharp contrast to average equity ratios in Japan and the United States, both of which have fluctuated within a 40 -50 percent range.

In short, over the period of 1970-1984, more than 72% of total funds of the corporate sector were financed externally. Of the total external sources, equity capital accounted for only about 15%, retained earnings for reinvestment decreased sharply from 36.7% of total funds in 1963-70 to 7.5% in 1981-85. Even more dramatic was that net private corporate savings were negative in 1982. Korean firms have traditionally generated low rates of profit because they have concentrated on capacity expansion and export market share enlargement. In their scramble to become chaebol, the emphasis of firms was on volume of activity and not on profitability. Bankers lent on the strength of the government's guarantee and not on the financial soundness of the enterprise. Low margin operations can be successful in a high-growth phase, and leverage can provide firms with an edge for market share and growth. However, aggressive financial strategies become double-edged swords when economic activity stagnate and/ or markets mature. Overindebtedness, combined with inadequate profitability, and very low capitalization of individual firms rendered the Korean industrial sector vulnerable to uncertainty or external shock. Excessive financial leverage and large firm size also tended to diminish the resilience of the economy in the face of adverse economic shock. The government was constrained in its economic management, for example, with respect to restrictive monetary policy by the size

of corporate debt.

Several other factors can also be identified which explain the extreme financial leverage among South Korean firms. First, the income tax system gives firms a strong incentive to borrow. Aside from tax deductibility of interest payments, the effective tax rate on interest income was substantially less than that on income from stocks during the period noted above (Kim, 1990). This is exactly the opposite of the U.S. personal tax system, which taxes interest income more than capital gains, based on tax rates as of January 1985. According to Kim's estimates, the marginal net tax advantage of debt in South Korea was almost four times that of debt in the United States (Kim, 1990). In the presence of such a tremendous difference in tax incentives, it is not surprising that Korean corporations relied on debt much more than their U.S. counterparts.

Second, crucial in government policy was the peculiar role of commercial banks. These banks were nationalized and relegated to supplying policy- directed loans to government-designated large enterprises. During bad times, banks were directed by the government to bail out large, ailing firms in order to prevent the widespread economic and political repercussion of failure. This policy raised expectations of future bailouts for other companies. In this environment, companies rushed to maximize a firm's growth by borrowing in order to become a large and indispensable firm, often to the brink of bankruptcy, with certain assurance that government- designated banks would come to their rescue. The government's frequent bailouts of large corporations have prolonged the lives of

many firms that were financially weak with excessive financial leverage.

In short, Korea's rapid growth is not the result of free-market policies, but rather effective government involvement in all aspects of the economy. The often-used policy of low-interest loans to targeted industries gives explicit and implicit interest subsidies to risky firms, thereby reducing the cost of borrowing for these firms. Such subsidies reinforce a strong incentive for eligible firms to borrow and increase their leverage. This chapter, combined with the last chapter, highlights the fact that the South Korean state, throughout its planning and direct intervention in the financial system, was responsible for the economic progress made during the last three decades, the period when Korea was designated as a market miracle by many mainstream economists. It may be said that growth of firm size was faster in South Korea not because markets have been allowed to operate more freely but because the practice of subsidization was qualitatively superior.

State support of chaebol activities through highly subsidized credit also led to greatly increased corporate debt-equity ratios, leaving the chaebol and the economy increasingly vulnerable to future economic instability. It led to over investment and excess capacity in a number of HCI industries. Business concentration was helpful to South Korea in providing economies of scale in production as well as name recognition abroad. The small number of large conglomerates also make it easier for the government to impose its will on firms in the second half of the 1970s. Other dangers included the concentration of

wealth and political power that is inimical to democracy, as well as the conflict between private efficiency and social equity that results from economic concentration (Scitovsky, 1986).

4.5. Taiwan's Small Businesses

The abundance of economic controls exercised by the government through a succession of four-year plans makes it difficult to characterize Taiwan's economy as laissez-faire, but in some respects the Taiwanese government knows how to let market forces take their course (Scitovsky, 1986). Compared with South Korea and Japan, Taiwanese businesses are the least concentrated. A comparison of Korea with Japan and Taiwan in Table 4-1 demonstrates that among the three states, the level of concentration in Korea was significantly higher. The differences are mainly attributable to different government policies.

Table 4-1 Comparison of Simple Average Three-Firm Concentration Ratios for Korea, Japan, and Taiwan

Country (year)	Average Share (percent)
Korea (1981)	62.0
Japan (1980)	56.3
Taiwan (1981)	49.2

Source: Amsden (1989)

The presence of many small firms in Taiwan has been encouraged by such factors as Taiwan's public ownership of monopoly-prone industries (electric power, for example), and the establishment of the "Forty-eight Industrial Parks and

Districts," which provided a variety of advantages for start-up firms. But the two most important factors have been the absence of policies encouraging the growth of large enterprises and the government's willingness to let market forces work, once conditions conducive to economic growth were obtained.

In Taiwan the main incentives have been differential access to credit and the concessionary cost of credit. In fact both South Korea and Taiwan have for many years granted credit at lower cost to the approved industries. But the criteria that qualify a borrower tend to be more generally defined in Taiwan than in Korea. The concessionary or subsidy component of the cost of credit is usually several percentage points higher in South Korea than in Taiwan. Also, a five-year tax holiday for approved investments, remission of duties on imported inputs into export production, and exemption of exports from indirect taxes are standard in both countries (Hwang 1991), South Korea provided other kinds of preferential treatment through tax incentives. These are lower rates for profit taxes and substantial depreciation and wastage allowances in order to promote export and investment in targeted industries. On the dis-incentive side, the tax returns of wayward firms tend to be very carefully scrutinized (Bello and Rosenfeld, 1990). Firms that cooperate can make huge profits and expand accordingly. Firms that do not cooperate, have a very difficult time getting loans, an especially harsh sanction given the extent to which businesses rely on bank loans in South Korea. Moreover, in view of South Korea's generally lower average interest rates and inflationary climate, the real interest cost of such concessionary loans in Korea has

often been zero or even negative. Most of Korea's concessionary loans are given by specialized banks and nonbank financial institutions, many of which are under the direct control of the Minister of Finance rather than the Bank of Korea (Cheng and Haggard, 1987).

In addition, there is no doubt that the conservative monetary policy in Taiwan has important indirect effects on the development of small businesses. Because the government created a stable economic environment, exporters could make plans for the future with confidence. In the relatively open credit market, it has been fairly easy for small, untried businesses to obtain financing. Moreover, realistic interest rates had limited the profits of business enterprises, resulting in slower rates of growth for individual firms; this has helped keep very large firms from crowding out small ones and has helped maintain competition. The result in Taiwan has been the proliferation of small businesses and restraints on their size. The economy is more of the grass-roots type, which benefits the masses.

CHAPTER FIVE

FOREIGN INVESTMENT AND TECHNOLOGICAL TRANSFER IN TAIWAN AND THE DIFFERENCES OF FOREIGN INVESTMENT POLICIES BETWEEN KOREA AND TAIWAN IN THE 1980S

South Korea and Taiwan are cited in the development literature as examples of a successful export promotion based on low-cost, labor-intensive production. Few studies have paid adequate attention to the policies adopted by either country to facilitate the recent transformation of their technological base. Yet, a full understanding of why South Korea and Taiwan have been able to prosper in the international marketplace and maintain appreciable growth even in the midst of recession and increased global competition requires that state-driven technological progress not be ignored. This chapter focuses first on the background and substance of recent government involvement within the framework of technology advancement for both countries in their respective economy. Insofar as the study is an international comparison between the two countries, section 2 assesses the unique relationship between the Taiwanese government and the business sector in general. Due to Taiwan's peculiar international status, there are unique conditions that deserve special mention. In addition, differences in policies between the two countries toward multinational and foreign investment are also

discussed.

5.1. Governments' Policies in Assisting Advances in Technology

The kind of efforts in South Korea and Taiwan to create a capable and responsive R&D infrastructure are common to all the Asian NICs. The purpose is to strengthen and increase indigenous scientific and technological resources in the face of rising domestic wages, the high cost of imported petroleum, shortages of skilled labor, and growing protectionism in the West among others. To some degree, the restructuring of technological advances also has been driven by the tightening of access to advanced technology by some multinational corporations (MNCs), who feel threatened by the success of the Asian NICs. While the trends seems to be toward globalization, it should not be forgotten that technological protectionism also is at work. Thus, 1980 was not only the year for which Korean government turns around its pervasive interventions, it also marked the beginning of a transitional phase for which comparative advantage will be based on an increasingly more skill-and technology-intensive base industry structure.

South Korea and Taiwan have followed a similar strategy since the 1980s, although particular instruments and degree of intensity may vary. Current policy focused on functional intervention in areas such as technology and manpower development--areas which are seen to be important for future export performance and in which classic externalities and market imperfections may be significant. A series of related policies have been implemented to improve the process of

importing and using technology. In particular, taxes on technology imports have been drastically reduced, and much of the red tape formally experienced by foreign suppliers and local recipients has gradually disappeared. A combination of economic policy instruments such as tax and financial incentives has been instituted to facilitate the diffusion of existing technology. For example, to stimulate R&D generally, the Korean government set a lower tariff rate on equipment imported for R&D purposes. The provision is important for technology intensive firms. The Korea government also allows firms to set aside a percentage of profits in a reserve fund that is exempt from taxation for a fixed period for eventual investment in R&D. As the government reformed tax credits and sweetened its incentive, the number of centralized corporate R&D laboratories rose from 3 in 1967, to 14 in 1976, to 52 in 1980, to 138 in 1984 (Amsden, 1989). Venture capital corporations have been established by the government to lend to technology-oriented start up firms. In addition, various state- sponsored agencies have been created to ensure that new knowledge and technology spread to relevant end-users. One good example is the Institute of Information Industry created in the late 1970s in Taiwan (Simon, 1992; Cheng and Haggard, 1987; Koo, 1985).

5.2. The Role of the State in Taiwan's Technological Advance

Although in principle market forces were allowed to guide operation of the economy, the Taiwanese government often found it necessary, and at times

desirable, to intervene if the private sector was not responsive or the local economy lacked the maturity to compete effectively in the international market. Two specific factors shaped the activities of the Taiwanese state.

The first was the continued predominance of small and medium-sized companies in Taiwan. Owing to their size, many were unable to more than imitate; they either lacked R&D resources or were unwilling or unable to assume the level of risk frequently associated with being a technological leader. Furthermore, small size either precluded investment in imported technology or reduced the bargaining position of companies vis-a-vis foreign corporations. As of 1983, of 706,500 business enterprises registered, 98.6 percent were classified as "small and medium," meaning that their annual business revenue was less than $40 million New Taiwan (N.T.) Dollars, equivalent to $1 million (Simon, 1992).

The second factor is the distant relationship between business (indigenous Taiwanese) and government (mainlander- Chinese), a consequence of the island's unique political history. This made the task of forging stronger links between the two much more problematic than in South Korea. With some exceptions, the private sector was not very responsive to the government's invitation to join forces. As a result, the State frequently had to play a larger direct role as an initiator than in South Korean, where financial policies could be used instead.

The state, through its economic influence, has been the initiator and facilitator of Taiwan's technological development through its industrial targeting policies, its identification of strategic industries, its ability to reduce costs, and its

willingness to increase rewards(Simon, 1992). The Taiwanese state has been able to stimulate market response and affect the R&D process itself. In 1978, national expenditures on R&D constituted 0.48 percent of GNP, or about U.S. $111 million (Simon, 1992). The government accounted for more than 56 percent of the total; the private sector contributed about 30 percent. More important, the private sector's spending on R&D was only 0.12 percent of sales, compared with 2.0- 3.0 percent in the United States and Japan. This again reflects the generally small size of Taiwanese firms and their tendency to ignore the potential value of a long-term commitment to research. By 1984, national expenditures on R&D had climbed to 1.0 percent of GNP, or U.S. $400 million, and the government's share had dropped below 50 percent. Preliminary government data for 1987 indicate a figure of 1.16 percent of GNP level, which would mean that between 1980 and 1987 R&D spending in Taiwan grew at an average annual rate of 12.1 percent, faster than in Japan (4.1 percent) but slower than in Korea (14.3 percent) (Simon, 1992). According to Taiwan's Ten-Year Science and Technology Development Plan (1986-1995), R&D expenditures are projected to reach 2 percent of GNP by 1995 (Frasman, 1986). Over time the government share of R&D spending has gradually declined as the private sector invests more, indicating its growing involvement in Taiwan's expanding R&D activities.

The most recent manifestation of government policy toward technological development is the establishment of the Hsinchu Science and Industry Park in the central part of the island.[1] Touted as Taiwan's Silicon Valley, the Hshinchu Science

and Industry Park represents movement into the next stage of economic development, where industries will be characterized by their skill and knowledge intensity rather than labor intensity. Whereas during the 1960s and 1970s the three export-processing zones were the keys to Taiwan's export expansion drive, Hsinchu Park represents the new emphasis on high technology. Investments in the park reflect the island's current target industries--microelectronics, computers, computer peripherals, information science, materials, automation, and robotics (Cheng and Haggard, 1987). The park is also the site of some of the first R&D by foreign firms on the island,[2] which now account for about 0.5 percent of Taiwanese R&D expenditures (Simon, 1992). Another fundamental purpose of Hsinchu Park is to capture the spillovers from foreign firms in terms of training and technology transfer. The authorities hope that domestic companies will view the presence of these high-technology firms as "opportunity creating," inspiring some of them to move into the new industries. These, in turn, the government hopes will become the future source of competitive advantage for the island.

5.3. Foreign Technological Transfer and Multinational Corporations (MNCs) in Taiwan

Taiwanese leaders have adopted a two-pronged strategy to promote the development of science and technology. One major goal has been to use technological upgrading to expand and extend the island's "interdependence" with key actors in the international economy. In essence, this policy seeks to increase the "reliance" of transnational firms on Taiwan as a foreign investment site and as

a source of sophisticated components. The other goal has been to increase the island's technological self-sufficiency through industrial and technological deepening. Economic and political concerns about the availability of adequate energy supplies, military equipment, and so forth, have led the state to a different attitude toward foreign investment and foreign multinational(MNC) than Korea's.

In addition to these unique political circumstances, not unlike two other Asian NICs (Hong Kong and Singapore), Taiwan opted for technology transfer through MNCs. Since most of the critical technologies being sought by Taiwan are owned or controlled by major multinationals, it is not surprising that relations in the technology arena have grown steadily over the last two decades. In general, the state has managed the processes of foreign investment and technology transfer in such a way as to maximize the flow of foreign technology into the local economy. Rather than viewing the acquisition of foreign technology as separate from other development-related initiatives, the state has sought to ensure that development objectives in the areas of employment, trade, training, and so forth, are all served by closer links with foreign firms, especially where exports are concerned. The approach to technology import was, in fact, conceived as part of a larger state-led strategy of economic development.

During the 1970s, whereas South Korea basically eschewed foreign investment in favor of technology licensing and high foreign debt, Taiwan was not significantly apprehensive about foreign equity holdings in the industrial sector. In fact, the government attached great importance to links with multinational

corporations, which in some ways extended political issues into the economic and technology arenas. That is, relations with MNCs acted as a proxy for formal diplomatic relations. The participation in a "transnational system" provided the island with international legitimation. This is particularly significant in view of the fact that foreign direct investment has contributed only a modest amount to overall capital formation in Taiwan, averaging approximately 15 percent over the last three decades (Simon, 1992).

Since foreign technology was viewed by the Taiwanese government as a means to overcome domestic limitations to entering overseas markets, state policy has sought to link the selective acquisition of technology with the ongoing efforts of local firms to build up a highly complementary, indigenous science and technology capability. Rather than competing head on with firms from the industrial nations, as was the case with South Korea during the HCI program period, Taiwan's strategy has been to manufacture products and components that build upon products designed and offered by MNCs from advanced countries (Rhee, 1979). Thus, foreign investment and subcontracting became important vehicles for technology transfer to firms in Taiwan.

Moreover, the key to their ability to make effective use of foreign know-how was in the approach they adopted, an approach that once again reflects the smaller size and more limited resources of Taiwanese firms as compared to their South Korean counterparts. Capital and personnel resources were targeted to meet specific rather than general or ambiguous objectives (Simon, 1992). These

resources were drawn from a physical and educational infrastructure developed over many years on the island. It was in this sense in Taiwan the degree of dependence on outside sources was generally much greater than in South Korea.

The interest of foreign firms in Taiwan began to grow in the late 1960s as a result of the island's infrastructure, a series of investment statutes which made the island an attractive site, and the abundant and dependable labor force (well-educated, low paid, and disciplined) was particularly advantageous for assembly-type operations. Further interest was sparked by the formation of the Kaoshsiung and Nantze export processing zones, each offering very attractive incentives to international investment (Ranis and Schive, 1985).

Nevertheless, most of the initial foreign investment, especially in the export processing zones, resulted in little direct technology transfer[3]. Most of the projects were in the light industry category (such as toys, garments, consumer electronics, and food processing) and involved simple assembly. The zones operated like foreign enclaves, and there was minimal contact with the local economy except through the workers who moved in and out of the zones in response to new or better employment opportunities. Over time, however, it was the mobility of the labor force that proved to be one of the main vehicles for technology skills transfer, especially among middle managers and technical personnel. A number of people who worked in the zones went on to start their own companies or brought their skills into the local economy for use in domestic firms. Moreover, as the local economy matured and domestic industries were strengthened, the state gradually

permitted more intercourse between zone-based firms and the island's economy than appeared possible on the surface.

As foreign investment increased during the 1960s and 1970s, so did the number of formal technical cooperation agreements sanctioned by the state. Particularly as a result of government-imposed domestic content requirements, the technological modernization of Taiwan was set in motion. In some circumstances, the state required technological assistance as part of the approval process for establishing factories. As domestic industries became sophisticated, foreign firms did more local sourcing because it was cost-effective as well as good business practice to help upgrade local capabilities. The Taiwanese experience underlines the fact that the successful use of foreign technology depends on an effective set of policies for regulating the inflow of this technology. National controls, combined with enhanced domestic capability, greatly improved technology transfer in Taiwan.

5.4. Korean and Foreign Direct Investment During the 1960s and 1970s

There was no legislation in South Korea regarding foreign direct investment (FDI) until 1960. Before 1973 and after 1980, such investment was handled more liberally than in the intervening period characterized by rather restrictive conditions and tight control on the inflow of foreign capital. Since the second half of the Park regime, the Korean state has preferred foreign loans to foreign direct investment, raising its foreign debt to about U.S. $ 46.7 billion by 1988 (Koo, 1985). One reason for this preference lies in the political arena of the U.S. decision to reduce

its military presence in the 1970s. Since large lenders presumably are anxious to keep their investment secure, the logic was that foreign loans equal a commitment to defend South Korea.

Another feature of state policy until 1979 was to control the activities of MNCs in favor of local businesses by controlling all foreign direct investment. Policies for regulating the activities of foreign firms regarding direct investments also had been instituted to ensure that the activities of Multinational Corporations (MNCs) were consistent with the country's overall technological priorities. Majority foreign-owned firms were permitted only in exceptional cases such as entirely export-oriented investments, highly technology-intensive projects, projects for Korean residents abroad, or investments in the free trade zones (Caiden and Kim, 1991). Meanwhile local enterprises were protected from foreign investors in those areas in which the state wanted to develop local production capability, that is, virtually all manufacturing sectors. This policy presumably contributed to the emergence of the chaebols because these firms were able to expand rapidly under the umbrella of government's protection. The favored arrangement for technology transfers was joint ventures in which the local partner owned at least 50 percent of equity.

Table 5-1 Indicators of MNC Activities: Korea and Taiwan

Activity	Country	1974	1975	1976	1977	1978
% of GNP	Korea	2.8	3.2	3.4	3.4	3.8
	Taiwan	6.2	6.9	7.1	7.9	8.9
% of Total Manufacturing	Korea	16.7	17.4	16.6	16.0	17.8
	Taiwan	15.8	18.3	17.7	19.9	21.8
% of Total Labor Force Employed	Korea	1.0	----	----	----	5.4
	Taiwan	4.6	4.6	5.1	5.0	5.1
% of Labor Force in Manufacturing	Korea	9.0	9.0	10.1	10.5	----
	Taiwan	16.4	16.6	13.3	16.6	16.2
Exports as % of Total Sales	Korea	27.8	18.3	17.7	19.9	21.8
	Taiwan	61.7	57.9	62.6	61.4	61.7
Exports as % of Total Exports	Korea	16.9	15.2	17.8	18.6	18.7
	Taiwan	29.2	29.4	28.6	29.0	29.1

Sources: Lim (1985)

We can also see from Table 5-1 that MNC activities were not as important in Korea as they were in Taiwan. In Taiwan, MNCs contributed almost one tenth of GNP and exported well over half of their exports as percentage of total sales. Even though MNCs activity accounted for less than 4 percent of Korea's overall GNP in 1977, its impact in manufacturing was quite significant. MNCs accounted for 16 percent of total manufacturing output and over 10 percent of manufacturing employment. They also produced almost 19 percent of Korea's total exports. Nevertheless, it is also true that the Korean state was able to confine MNC to those industries and activities consistent with its own priorities of developing its indigenous business groups.

In summary in the past few years, the contribution of foreign investment to South Korean gross capital formation has been only 1.2 percent (Bello and

Rosenfeld, 1990) in comparison to 15 percent for Taiwan. The difference reflects the two countries' attitudes toward foreign capital. Taiwan has used MNCs as the main agents of technology transfer, whereas in Korea, the state invited the MNCs mainly to use them as the mediating agents of technology transfers for the purpose of reinforcing export promotion of manufactured goods. In the 1980s, the government began to encourage direct foreign investment in the high-technology industries, but even as the absolute quantity of direct foreign investment increased, it still amounted to a lower percentage of GNP in 1985 than in 1965 (Amsden, 1989).

CHAPTER SIX

DEVELOPMENT OF MACHINE TOOL INDUSTRY IN SOUTH KOREA AND TAIWAN

Despite its small relative size, the machine tool industry is of strategic importance to a country's economic growth. Machine tools are called "the machine of machines" because virtually every major manufactured product is produced by them or on machines built by them. The role of this sector in generating and diffusing innovations has made it of central concern to many governments in advanced nations as well as in some developing countries. This is particularly true in Taiwan and South Korea.

Chapter 6 examines the machine tool industry in Korea and Taiwan at the industry level, a departure from typical practice because most studies of government intervention in LDCs tend to be highly aggregative. In a relatively technical-intensive sector, the machine tool industry is one strategic industry subject to Korean style import substitution and protected from foreign competition by its government. Generally, intervention in the machine tool industry takes the form of tariffs, quotas, export subsidies credit, and so forth. Compared with Taiwan's progress, the growth and development of the South Korean machine tool

industry is not as vibrant as the one in Taiwan. Careful study of the machine tools industry, therefore, provides some supporting evidence that in South Korea, distortion created by state intervention is responsible for the relative delay in growth in that particular industry. However, some appreciation of the differences in policy management between the two may be gained by examining first the characteristics and then the structure of this particular industry.

6.1. General Characteristics of the Machine Tool Industry in Developed Countries

The machine tool industry is relatively small in most developed countries. Even in Germany, the largest producer, the output of this sector is insignificant in relation to the engineering industry as a whole. That output is consumed mostly by the engineering sector (ISIC classifications 381-385, including the machine tool industry itself). Thus, the demand for machine tools depends heavily on the investment behavior of engineering industries, which, in turn, depend on the domestic and export market for engineering products.

The high value-added per unit of output indicates two further important characteristics of the machine tool industry: it is very skill-intensive, and the fabrication process is highly complex. In both Japan and the United States, for example, the ratio of value-added to gross output in the industry was significantly high compared to the average in the electrical machinery branch, which, in turn, was much higher than the average for total manufacturing. Yet, as shown in Table 6-1 for Japan and the U.S., labor productivity is relatively low which reflects the

labor-intensive nature of the industry.

Table 6-1 Value Added for the Machine Tool Industry, Metal Cutting, Japan and the U.S., 1976

Country	Ratio of value added to gross value	Value added per employee (dollars)(VAPA)	VAPA compared to average mfg total (index)
Japan	49.3	13,243	0.81
U.S.	66.6	28,642	0.98

Sources: Based on Table 2.3, World Non-Electrical Machinery, in United Nations, An Empirical Study of the Machine Tool Industry, 1984.

One of the most pronounced structural characteristics of the machine tool industry is the predominance of small firms-- companies employing more than 200 persons are rather exceptional. Furthermore, large firms tend to diversify their production into other products. For example, in pre-unification West Germany ranged between 500 and 1,000 with small firms predominating. In 1978, there were 450 firms, and three-quarters of them had fewer than 25 employees; only 15 firms employed more than 500 persons (U.N., 1984). Furthermore, the degree of concentration is relatively low compared to other engineering industries. For example, in the U.S. the four largest firms account for around 20 percent of the total output of machines tools. Figures are similar in other leading countries.

Another industry characteristic is that most firms are highly specialized in the production of one type of machine tool and produce a small quantity of customized products according to orders received. Although the market for machine tools is small, product lines can be quite diverse. Consequently, scale

economies are not possible in the production of most types of machine tools. Still the most important trait associated with the industry is the extreme cyclicality of its income, profits, and cash flow.

As in the case of many other capital goods, demand for machine tools fluctuates widely following economic conditions; this requires flexibility in adjusting production in the industry. Somewhat longer than business cycles, oscillations in demand may run as long as 10 years from peak to peak, according to a study by the United Nations (U.N. 1984). The demand fluctuations in these cycles average between 25 and 35 percent, although in individual cycles the range can be much greater. The primary reason for cyclical demand is what might be termed an accelerator effect in purchases of major capital equipment. That is, relatively small changes in the demand for commercial products induce great changes in the demand for capital equipment. A major reason for cyclical industry sales traditionally has been the very duality of machine tools themselves. Only major business growth or product changes have spurred large orders of new machine tools. In addition, a very high percentage of customers are in the metalworking sector and are themselves confronted with cyclical markets. Thus, variations in demand for such major consumer durables as automobiles further contribute to the cyclicality of the machine tool market.

The industry is unusually sensitive to fluctuations in the general business climate. In general, orders for machine tools tend to decline in advance of a recession and to lag recovery. Yet, machine tool manufacturing building is in

many respects very poorly suited to a cyclical market. The relatively high skilled labor requirement, long production lead times, and high work-in-process inventories that characterize the industry pose great problems. Many of the major difficulties that beset the industry--ranging from capital formation to chronic manpower shortages--stem from these oscillations in demand.

Fluctuations create serious problems within the industry. For example, if employment must be cut significantly due to lack of demand, some of the highly skilled labor is irretrievably lost; then, when orders rise again, there is a serious shortage of skilled workers. Furthermore, the uncertainty in employment prospects makes recruitment and training difficult. The training period may take 4 or 5 years, which easily could extend beyond the life of a demand cycle. Therefore, machine tool firms tend to retain highly skilled workers on the payroll even during downturns, causing even slower productivity growth in the industry.

The machine tool sector also is technology intensive and needs the support of other industries for its raw materials and parts. As a country's technology develops, the requirements for the function and precision of machine tools become stricter and the demand for quality materials and parts becomes higher, which, in turn, affects other upstream industries. For example, some high-end machines tool are made from special steel to increase their precision. Consequently, industrial linkages are important determinants of comparative advantage in the machine tool industry.

Finally, moderate growth prospects, relatively low profits, and high capital

costs historically have characterized the machine tools industry. The instability of the machine tool market places this sector in the moderate to high-risk investment category. Coupled with low profits and fluctuating cash flow, high risk makes the capitalization of new equipment or production processes extremely difficult. The average rate of profit in the U.S. industry was 4.4 percent of sales after taxes as of 1978 (UN, 1984). In peak periods, however, the rate of profits among machine tool builders is comparable to (or even higher than) that in other manufacturing industries which makes up for the low rate during downturns.

6.2. Characteristics of the Machine Tool Industry in Developing Countries

Machine tool producers in developing countries tend to be less specialized and more vertically integrated than their counterparts in the advanced nations (UN, 1975). This is true in other industries as well. Pack and Westphal (1986) note the absence of specialization and the failure to develop subcontracting networks in the mechanical engineering industries in several less developed countries. Huq and Prendergast (1983) observe the same phenomenon for machine tools. This is easily explained, since capital goods industries normally begin with production for the domestic market, the size of which depends on the size of the economy in question and the level of development of machine-using industries in general. Market demand for any single product may be insufficient to allow reasonable levels of utilization of expensive equipment, and the firm tries to maximize its use by adding products to its range. High levels of vertical integration also occur, due

to the inability of plants to source locally such inputs as castings and engineering fabrications of sufficiently high quality. This means that additional production facilities have to be provided in plant, which reinforces the tendency for firms to expand output through a wider range of products.

The lack of horizontal specialization in the machine tool sector in developing countries, thus, may be attributed to the small market for particular products and to the low level of development of the domestic engineering industry. Growth in the international market might be expected to create opportunities for product specialization and a reduction in the degree of vertical integration through the use of specialized shops. Such shops can produce inputs at lower cost because they supply a number of customers and therefore can use more specialized machinery and achieve higher rates of capacity utilization. There are efficiency gains to be achieved through specialization.

Such changes have been observed by Amsden (1984) in the case of the Taiwanese machine tool industry. In 1974 Amsden found few signs of horizontal specialization in Taiwan, but by 1982 the situation had changed dramatically. A well- articulated system of subcontracting and satellite shops along Japanese lines had evolved. Some machine tool firms had begun to subcontract a substantial proportion of value-added of parts and components while continuing to produce the main body of machine tools. Others had begun to concentrate exclusively on the manufacture of parts and components for export and local markets.

6.3 The Rising Share of Machine Tool Exports in the World Market

The two most essential determinants of plant location in the machine tool industry are sufficient demand and comparative advantage. The latter is determined, in turn, by several other factors, including the accumulation of technology, the availability of manpower, domestic R&D capability, the availability of economically and technologically suitable inputs, and the existence of auxiliary industries. Because most of these factors are present only in a limited number of developed countries where the engineering industry is highly developed, the production and export of machines tools are highly concentrated in these few developed nations. Also, their well-developed engineering industry provides a large domestic market. Until the 1960s, technological superiority determined almost exclusively the comparative advantage of a country in machine tool production. This was especially true for the U.S. Since then, however, changes in comparative advantage have encouraged an increasing share in world output as well as in world export of machine tools by a few extremely export-oriented developing countries, such as Taiwan and South Korea.

Several factors have contributed to the rise in share of non-U.S. producers in this trade. First, throughout the late 1960s and early 1970s, the U.S. dollar was overvalued relative to other currencies, and foreign competitors had a distinct advantage over U.S. machine tool builders. Secondly, the long lead time for orders and delivery from U.S. machine tool producers may have stimulated imports in some years. That is, strong demand for machine tools in the U.S. market in

1973-74 and 1978-80 resulted in a huge delay in deliveries. The implicit price of machinery includes the foregone earnings or profits which could have been generated while waiting for the machinery to be delivered, and the cost to buyers of waiting for delivery can be substantial. As noted earlier, this is the inevitable result of market instability and the difficulty of matching production capacity to demand fluctuation. U.S. manufacturers, thus, were at a competitive disadvantage vis-a-vis foreign competitors. The success of some foreign exporters entering U.S. markets during this time may have had something to do with being able to deliver orders promptly. Third, they could deliver promptly because a producer requires only a short lead time to make standard products, and some of these foreign firms produced standard machine tools for inventory without having a specific customer in mind. Despite the high financing costs of carrying inventory, this strategy apparently helped some foreign competitors gain market share.

6.4 The Machine Tool Industry of Taiwan

During the 1960s and 1970s, there was rapid growth in the size and technological sophistication of the machine tool industries in developing nations, especially the Asian NICs. In Taiwan the sector rose from a negligible exporter in 1973 to the fourth largest source of U. S. imports in the 1980s behind Japan, West Germany, and the United Kingdom (U.N. 1992). The achievement was remarkable, especially considering how new the industry is in Taiwan. Begun after World War II, Taiwan's machine tool industry was retarded by the small size of the

local market and by the low technical level of its customers (Amsden, 1977). Table 6-2 gives the names and the founding date of the ten leading machine tool firms in Taiwan.

Table 6-2 The Top Ten Machines Tool Industry Firms in Taiwan

Position	Company	Date of Establishment
1	Leadwell CNC Machine MFG. Corp.	October 1980
2	Taichung Machinery Works Co., Ltd.	October 1980
3	Yeong Chin Machinery Industries Co., Ltd.	April 1968
4	Dah Lih Machinery Industry Co., Ltd.	October 1980
5	Far East Machinery Co., Ltd.	October 1949
6	Falcon Machines Tools Co., Ltd.	April 1978
7	Yang Iron Works Co., Ltd.	January 1945
8	Chin Fung Machines Industries Co., Ltd.	February 1948
9	Tong Tai Machines & Tool Co., Ltd.	January 1969
10	Chiao Fu Machine Industrial Co., Ltd.	June 1984

Source: S. D. H. Tsai (1992, P. 154) The Development of Taiwan's Machine Tool Industry. Wang N.T. (ed.) Taiwan's Enterprises in Global Perspective (1992) M.E. Sharpe, Inc.

The industry is composed of a large number of small aggressive companies, most of them located around Taichung, in the central part of the country. The industry, heavily dependent on exports, is dominated by about 50 companies (1992). They have mostly concentrated on the production of parts and components and on assembly of standardized machines with lower technological requirements. According to a U.N. study (U.N. 1992) the influx of non-numerically controlled (non NC) lathes from Taiwan into the U.S. market has virtually eliminated U.S. production of that product.

Two important factors in the success of Taiwan's machine tool industry were

its strong technical background and the critical components supplied from Japanese manufacturers. Even more important is the active participation of industry in the world market. The significance of exports can be seen in Table 6-3 which shows a trend of steadily increasing export ratios, although imports have become more important. Starting from an obscure beginning the industry started selling to other Third World countries in Southeast Asia, such as the Philippines and Thailand, and gained further experience with these markets during the Vietnam War in the 1960s. New business was sought aggressively from industrialized countries, especially the U.S., in the 1970s and 1980s. This vigorous participation enabled the industry to grow tremendously because import and export movements formed an essential technical and financial part of its evolution.

Table 6-3 Export and Import Ratio of the Taiwan Machine Tool Industry, 1974-81, in Thousands of N.T. dollars

Year	Value of Production	Export Value	Import Value	Value of Demand	Export Ratio	Import Ratio
1974	1,272	560	1,267	1,979	0.44	0.64
1975	1,347	622	1,197	1,923	0.46	0.62
1976	1,750	1,237	1,550	2,062	0.71	0.75
1977	2,711	1,974	1,531	2,269	0.73	0.67
1978	4,538	3,553	2,247	3,232	0.78	0.70
1979	7,131	5,364	3,177	4,943	0.75	0.64
1980	8,323	6,115	4,630	6,271	0.73	0.65
1981	9,453	8,031	4,674	6,096	0.85	0.77

Sources: Taiwan Association of Machinery Industry, 1987

Finally, an important factor to be mentioned is the comparative price advantage of machine tools produced by Taiwanese manufacturers. While there

are few data available on the cost of materials or of capital, we can still review relative labor compensation rates, the major cost faced by the principal world competitors. Generally speaking, unit labor costs would be a better measure of labor cost than compensation per hour because the former take productivity into account. Such data do not exist, so wages and salaries must be used. Table 6-4 gives information on comparative wages and salaries for nine countries in 1978. A quick glance shows that these are substantially lower in Taiwan than elsewhere. For example, the average Taiwanese salary for mechanical engineers were 69 percent of that in Korea, 57 percent in Singapore, 33 percent in Japan, and 14 percent in West Germany. In the case of skilled worker the Taiwanese salaries were 53 percent of that prevailing in Korea, 81 percent in Singapore, 14 percent in Japan and 13 percent in West Germany. (See Table 6-4)

Table 6-4 Comparative Wages and Salaries in Eight Asian Countries and Germany, Mid-year 1978, Mean Monthly Salary in US Dollars

Professional Group	Taiwan	Korea	Hong Kong	Singa-pore	Thai-land	Indo-nesia	Malay-sia	Japan	Federal Republic Germany
Industrial engineer	358	639	618	821	437	752	652	1587	2884
Mechanical engineer	407	587	627	710	460	786	677	1244	2884
Electrical engineer	322	509	590	803	492	299	762	1025	2884
Accountant	482	1192	904	923	299	733	949	1521	1923
General manager	1051	1049	923	189	498	1513	2672	3413	5495
Prod. manager	729	889	2097	809	1784	851	1050	2488	3745
Section chief	461	590	498	669	851	439	786	3745	3222
Executive secretary	435	318	219	392	439	496	404	3222	1465
Typist	184	344	503	175	425	214	133	1360	1099
Junior clerk	150	493	153	214	133	173	180	756	1190
Foreman	369	318	114	135	173	241	390	785	1328
Skilled worker	167	311	198	203	241	137	181	1500	1282
Semiskilled worker	115	206	189	86	76	96	129	1161	1145
Unskilled worker	93	146	158	133	51	65	84	982	915
Tool maker	245	330	303	102	135	482	304	665	1465
Cleaning worker	120	208	170	108	77	53	82	550	824

Note: In addition to the monthly base salary, most companies also pay regular bonuses ranging from one to twelve months of salary, varying by company and by country. In order to make the monthly base salary information meaningful in terms of actual cost, this survey has increased the monthly base salary to include any bonuses paid, that is annual wage for 12 months plus bonus monthly base salary, but extraordinary bonuses, commission payments, and so forth have not been included.

SOURCE: Amesdan (1984).

6.5 The Machine Tool Industry of Korea

The Korean machine tool industry also originated after World War II, and it remained very small until the mid-1970s. In terms of the value of production it was only marginally smaller than Taiwan's, but recall (Table 2-1) that Korea's GNP is far larger than Taiwan's. The fast growth in the production of machine tools was based on a very rapid increase in the home market. In the second half of the 1970s, as part of the HCI program, the Korean machine tool industry went through a period of explosive growth. Unlike Taiwan, Korea is still a net importer of machine tools, as can be seen from Tables 6-5 and 6-6.

Import substitution played a large part in the Korean expansion of machine tool production; the export ratio was very low, only 12 percent in 1974 (Jacobsson, 1984). By 1991, Korea had become the largest consumer of machine tools among the developing countries, as can be seen in Table 6-7. There were 673 machine tool plants in 1988, with 20,746 workers (U.N., 1992), but the majority of these plants were quite new and had low employment levels. About 100 companies of longer standing account for more than half the production. The largest were built in a new industrial area developed by the government in Changon, near Pusan. After 1988, labor disputes slowed the growth of the domestic industry, and combined with a strengthened currency, resulted in growing demand being handled primarily by imports.

Table 6-5 Machine Tool Exports from Developing Economies, 1990-1991

Rank in 1991	Country	Exports (million dollars)		Percentage Share		Percentage Change 1990-1991
		1990	1991	1990	1991	
1	Taiwan	640.3	657.1	3.02	3.46	2.6
2	China	250.3	215.0	1.18	1.13	-14.1
3	Hong Kong	136.6	167.7	0.64	0.88	22.8
4	Korea	86.9	89.4	0.41	0.47	2.9
5	Brazil	37.8	54.0	0.18	0.28	45.9
6	India	28.8	25.0	0.14	0.13	-13.2

Source: American Machinist, vol. 136, No. 2 (February 1992), pp. 59-65.

Table 6-6 Machine Tool Imports by Developing Economies, 1990-1991

Rank in 1991	Country	Imports (million dollars)		Percentage Share		Percentage Change 1990-1991
		1990	1991	1990	1991	
1	Korea	851.1	880.0	4.01	4.63	3.4
2	China	544.0	564.0	2.56	2.97	3.7
3	Singapore	322.1	362.3	1.52	1.91	12.5
4	Taiwan	294.2	291.4	1.39	1.53	-0.9
5	Mexico	258.0	250.0	1.22	1.31	3.1
6	Hong Kong	151.8	164.4	0.71	0.86	8.3
7	India	114.3	100.3	0.54	0.53	12.2

Source: American Machinist, vol.136, No.2 (February 1992), pp.59-65

Table 6-7 Largest Consumers of Machine Tools Among Developing Economies, 1990 and 1991

Rank in 1991	Country	Consumption (million dollars)		Percentage World Share		Percentage Change 1990-1991
		1990	1991	1990	1991	
1	S. Korea	1,549.3	1,581.4	3.41	3.85	2.1
2	China	1115.4	1,186.6	2.45	2.89	6.4
3	Taiwan	597.6	615.8	1.31	1.50	3.0
4	Brazil	481.5	386.0	1.06	0.87	-26.1
5	India	328.3	305.3	0.72	0.74	-7.0
6	Singapore	281.7	296.4	0.62	0.72	5.2

Source: American Machinist,vol, 136, No 2 (February 1992),pp.59-65

6.6 Computer Numerically Controlled Machine Tool

The rapid technological change in the machine tools industry has altered the nature of competition in the industry. The first numerically controlled lathe was produced in the early 1950s. The information needed to produce a particular part was put on a medium, such as a tape, and fed into the numerical control unit, which in turn controlled the operation of the machine tool. By simply changing the tape, the same machine tool can quickly be changed to production of another type of product. This technological revolution combined the flexibility and automation of both electronics and machine engineering. The cost and unreliability of the first numerical control unit hindered the wide diffusion of the technology until minicomputers were introduced in the 1970s. These greatly increased the reliability of numerically controlled machine tools and were first marketed around 1975.

The use of microelectronics also meant a drastic reduction in price, a tremendous simplification in programming, and the spread of electronics to a range of functions not previously automated, such as tool changing and diagnostics. Computer Numerically Controlled lathes (CNC lathes) began to be produced in a volume hitherto unheard of as an alternative to conventional machine tools. One manifestation of the growing commercialization of numerical controlled machine tools was the increase in price competitiveness shown in Table 6-8. The price ratio of CNC lathes to conventional lathes dropped from 8.3 in 1974 to 2.9 in 1981.

Table 6-8 Price Ratios of CNC Lathes and Conventional Lathes in Japan, 1974-1981

Year	Conventional Lathes Price Per Unit (1)	CNC Lathes Price Per Unit (2)	(3) (2)/(1)
1974	2.07	17.20	8.32
1975	2.98	14.46	4.85
1976	2.43	11.75	4.83
1977	2.25	9.82	4.36
1978	2.59	11.10	4.28
1979	2.25	9.55	4.24
1980	2.75	9.57	3.48
1981	3.08	8.93	2.89

Source: Jacobsson (1984).

As a consequence of the rapid substitution of CNC lathes for conventional lathes, CNC products have accounted for a growing proportion of total machine tool sales in the world market. The demand for the conventional lathes has shrunk

not only in relative but also in absolute terms. This is a serious problem for Taiwanese [1] and South Korean producers, who generally specialized in producing the simpler engine lathes. For example, Taiwan, which had an export ratio of 85 in 1981 (see Table 6-3), exported 7,598 engine lathes in that year. Similarly, in 1982 Korea exported 1,558 engine lathes (Jacobsson, 1984). It is also in the engine lathes submarket that the NICs have gained a significant share of the U.S. market.

Some leading lathe producers in the Third World are attempting to move into CNC lathes, but the shift is not easy, especially in comparison to the original market situation. That is, those who decided to produce conventional lathes faced low technological barriers to entry which meant learning time was short. For example, several Taiwanese firms were not established until the 1970s (refer to Table 6-1) and quickly gained a market. The technological knowledge required of manufacturers was also less demanding in terms of design skills. They could and very often did copy other firms' models, and duplication greatly lowered R&D costs. Since most of the firms made standardized products, no specialized distribution networks were needed, and the existing network for other capital goods could easily do marketing and distributing for these firms.

In contrast, the barriers to entry into the CNC lathe market are far higher. Since the design of the mechanical part is much influenced by the development of the control unit, the design process is much more sophisticated than for conventional machines. Mechanical know-how is less important than the ability to

find electronic and electrical solutions. The development of the CNC machine also depends on the sophistication of the domestic engineering industry for new production technologies. Finally, producers must develop a close technological linkage with their suppliers as well as their users. Thus, for NIC firms, radical technical advances are required, design and sales personnel must be increased, and production and marketing capacities have to be strengthened accordingly. The switch in production entails considerable risk.

Table 6-9 shows that materials and components are the main cost (64 percent) in the production of CNC lathes. The content of the material also differs; rather than inputs that are primarily domestically produced and that have high labor content, such as foundry items, many materials must be bought from internationally specialized firms. Most important, the direct labor content of CNC is considerably less than for conventional machines.

Table 6-9 Production Cost Structure for CNC Lathes Produced in Very Small Batches Inputs

Cost Item		Percent of Total Cost
Material Cost:		64%
(a) Imported	46	
(b) Domestic	18	
Capital Cost:		17%
(a) Fixed capital	14	
(b) Work in progress and Inventories	3	
Labor Cost:		17%
(a) White Collar	8	
(b) Operators	7	
(c) Administration	2	
Miscellaneous		2%

Source: Jacobsson (1983).

The comparative advantage of producers in such NICs as Taiwan and South Korea due to labor costs becomes less significant in the production of CNC machine tools. Among the inputs acquired externally, the most important is the CNC control system, which, in the case of lathes according to Jacobson's estimates (1984), can account for 20-50 percent of total production cost. The same conclusion is reached by the U.N. study (U.N. 1984) which states that wage costs lose much of their significance in determining the overall production cost in a shifting to CNC machines.

There seems to be no serious technological disadvantage for an NIC-based firm trying to produce low-cost CNC lathes by outsourcing control units. The situation is different however, for a firm seeking a position at the more advanced

end of the spectrum. For these products, which include combining robotics with machine tools, outsourcing is becoming risky because of the rapid change in production design. It is vital to have in-house electronic R&D skills or at least a close linkage with an outside electronics firm. Potential entrants also must compete with the Japanese firms[1] which offer very low prices, short delivery times, and good service and maintenance. The ability to compete with the Japanese is the single most important factor for an NIC based firm to consider when analyzing its viability as a CNC lathe producer.

6.7 Government Policy and Entry into CNC Machine Tool Production

Both the South Korean and Taiwanese governments have specified CNC lathes as a strategic product. Both have shown a willingness to design polices that assist leaders in the machine tool industry to enter or consolidate entry into this market. State policy in both countries has been concerned primarily with achieving international competitiveness in designated priority industries, and exports are continually stressed by both. The magnitude of the intervention is different, however. Although complete data are not available, it appears that intervention in South Korea is much greater than in Taiwan, in part, because of the different needs of the industry (refer to Table 6-6). The difference also reflects greater overall state involvement in South Korea than in Taiwan.

6.7.1. The Case in South Korea

The South Korean government has played a major role in the development of the country's machine tool industry. Not unlike other sectors during the early industrialization period, the central features of its policies have been (1) the availability of long-term loans with subsidized interest rates; (2) import limitations on items that could be produced locally, and (3) financial assistance to firms that bought Korean-made machinery tools (Frasman, 1986). The government's interest in assisting in the machine tool industry was underscored in the 1981 Basic Plan for the Advancement of the Machinery Industry, which again emphasized import restrictions and credit polices. In general, all CNC lathes below a certain size must be acquired from domestic sources. Since the size limit is large, this means that the vast majority of CNC lathes cannot be imported. The import substitution policy to encourage development of the machine tool industry clearly suggests that the government has exerted more influence in South Korea than in Taiwan.

In the credit arena, the Korean government channelled large amounts of capital into the machinery industry in the latter 1970s. The most dramatic example of government intervention is the case of the now largest producer of CNC lathes in South Korea (and in the Asian NICs), a firm established from scratch in 1977, and granted a government loan of more than U.S. $40 million (Jacobsson, 1984). Other firms also received credit, but not on the same scale. Finally another difference between South Korean and Taiwanese policy regarding the machine tools industry is that in Taiwan a government agency decides whether to allow

imports; in South Korea the Machine Tool Makers Association has this power.

This brief case study of the machine tools industry illustrates two salient points. First, Korean government intervention in this industry has been decisive at the broadest level in terms of shaping overall machinery industry activity and at the subindustry level in terms of deciding such issues as firm entry, product specialization, pricing, and access to technology. Second, these government initiatives succeeded in creating an international competitive machine tools industry, largely as a result of the government's ability to create a closed and profitable domestic market from which to support its export campaign.

6.7.2. The Case in Taiwan

In the early industrialization period in Taiwan, there was very little direct government influence on the machine tool industry. The nominal tariff rate was very low, around 10 percent, and the effective tariff was about the same. Some subtle import controls on machine tools existed, but these were almost certainly less stringent than in South Korea. On the whole, the Taiwanese machine tool industry grew gradually and autonomously, starting from an initial choice of product/market mix with low barriers to entry. The indirect influence of government macroeconomic policy on this process probably was greater. Of particular importance to export success was the stability in the real exchange rate ensuring stable relative prices of foreign and domestic goods. This effectively reduced risk and allowed entrepreneurs to base their strategies on expansion in foreign

markets. Finally, price stability meant that domestic demand for machine tools grew constantly and did not fluctuate greatly, which contributed to the industry's smooth development.

As in other sectors, the Taiwanese machine tool firms, even the largest, tend to be significantly smaller than their South Korean counterparts. This has provided a rationale for the state provision of certain technology inputs. Around 1980 the government changed its policy of nonintervention in the machine tool sector in light of its ambition to develop a high technology industry as part of the national policy to build up the so-called strategic industries--the machinery, electronics, and information industries. These were first identified in the Ten-Year Plan of 1980-1989 (Frasman, 1986) and were further examined by a conference of experts in 1981, where a number of criteria were used to select industries.[2] In 1982 the government implemented the Strategic Industry Program, a selective intervention with approximately U.S. $250 million at its disposal. The money is allocated to individual firms for the manufacture of about 115 types of products. The explicit purpose of the fund is to absorb some of the risks associated with new and advanced product lines. It can be used to finance up to 65 percent of the costs of a new project, including skill formation.

The primary form of state technical assistance to the industry has been through the state-owned Industrial Technology Research Institute (ITRI) and one of its arms, the Mechanical Industrial Research Laboratories (MIRL), which has a machine tools center. The Machine Tool Center was established in MIRL in 1977

to conduct research on numerically controlled machine tools. In 1983, MIRL employed about 120 mechanical and about 100 electronic design engineers and had an annual budget of around U.S. $15 million (Frasman, 1986). In terms of R&D policy, MIRL plays a role similar to that of the Korean Advanced Institute of Science and Technology (KAIST), although MIRL's center for machine tools is substantially larger. One of MIRL's many activities was to design two CNC lathes suitable for smaller lathe firms to produce when they are just entering the CNC market.

There is a substantial subsidy in the technology inputs provided by MIRL. It has been estimated that firms only pay about one third of the manpower costs involved. Furthermore, the signing of a contract with MIRL usually guarantees a firm access to subsidized loans from the Bank of Communication, and by mid-1983 fifteen machine tool firms had borrowed a total of U.S.$10 million. The Bank of Communication thus bears part of the risk and therefore encourages investments that might not be undertaken otherwise (Frasman, 1986).

CHAPTER SEVEN

ECONOMIC REFORM IN THE 1980S

The production structure of both South Korea and Taiwan has become much more complex. The economies have grown to such size and sophistication that it is increasingly difficult to manage them through government planning. Meanwhile, internally, the costs and distortions of state-led industrial policy and government intervention have become clearly manifest, most obviously in South Korea, but in Taiwan as well. Consequently, a new generation of neoclassical economists in each country has called for reform. At the same time, international political forces also have come into play.

Externally, South Korea and Taiwan face pressures mainly from two directions. First, trading partners wanted them to open their markets, eliminate various "targeting" practices, and change their trade and industrial policies. Second, there were pressures from other Third World Countries in Asia. By the early 1970s, such low wage nations as India and Sri Lanka were seeking to expand exports, producing labor-intensive products that threatened to erode the competitive advantage of South Korea and Taiwan (Turner and McMullen, 1982).

Slowed economic growth, international and external political pressures have

led a growing number of economists in the state bureaucracies to question the utility of state-led policy and intensify debates over reform. It is claimed that increasing competition and interdependence at various levels call for economic deregulation and greater reliance on market forces, with minimal government involvement. Reform measures include trade liberalization, foreign investment and technology transfer policies and the promotion of free competition. In addition, the neglect of the service sector, particularly the financial service sector, is also seen as a constraint on further development (Cheng and Haggard, 1987).

7.1. South Korea: From Planning to a Market Economy, 1979-1988

The Park regime pushed the HCI plan aggressively after 1977; the economy began to overheat. Recognizing that inflation and the squeeze on small businesses would contribute as much to political opposition as would slow growth, Park finally changed course. A stabilization plan, Comprehensive Measures for Economic Stabilization (CMES),[1] was announced in April 1979 (Cheng and Haggard, 1987). It was intended to restructure the economy so that continued high growth would be more balanced. This required a dramatic change in the government's direction of the economy.

Implementation was delayed by the second oil shock, Park's assassination in October 1979, and the ensuing political upheaval. In 1980 South Korea experienced its first year of negative growth (-4.8 percent) since the Korean War, according to the Bank of Korea. Debt crisis and worldwide economic recession in

the early 1980s compelled the country to reconsider its development strategy and pushed it toward a stability-oriented course. When the new government of Chun Doo Hwan came into power, policy makers were determined to remedy the economic ills of the 1970s.

Chun Doo Hwan sought to establish a distinctive path that would distance his administration from the political and economic failures of the recent past. The first priority was to stabilize prices through sound fiscal policy and tight money controls. Chun also gave new prominence to monetarist technocrats who saw the most important development task as the achievement of macroeconomic stability. This required the reversal of long-standing inflation. The stated objective was economic stability, as well as growth, as opposed to the popular catchphrase of the 1970s, " growth first and distribution later."

Comparatively speaking, South Korea was remarkably successful in achieving price stabilization. The consumer price index dropped from an average annual growth rate of 17.9 percent (1974 to 1978), to 14.1 percent (1979 to 1980), and then to a mere 2.9 percent (1983 to 1984) (Bank of Korea). In the pursuit of these objectives, South Korea has chosen to rely on market mechanisms more than before and has managed to sustain vigorous economic growth. It has recovered its international competitiveness in industrial products and has improved its balance of payments. The details of these efforts are examined below.

7.1.1. Trade and Industrial Reforms - Case of South Korea

As noted earlier, a policy of liberalization of import liberalization and fewer restrictions on foreign investment was given added urgency by the growth of protectionist sentiment abroad and the desire to induce greater technology transfer at home. South Korea's active commitment to opening domestic markets is reflected in both lower tariffs and dramatic reductions in the number of restricted import items. In 1983 a five-year tariff reform package was passed with the aim of increasing the import liberalization ratio to 88 percent by 1985 and 95 percent by 1988 (Cheng and Haggard, 1988). The overall average tariff rates were cut almost in half between 1983 and 1989, from 23.7 percent to 12.7 percent. This dropped to 7.9 percent by 1993. Restricted items number only 41 out of a total of 8,270, showing import liberalization rates for agricultural and fishery products are 74.7 percent and 34.2 percent, respectively (Rhee, 1989).

However, in the wake of the liberal package, the government has employed an "adjustment tariff" of up to 60 percent on top of the general tariff for the purpose of protecting goods now subject to automatic approval. Indirect controls also have been put in place of strategic purposes.

South Korea also has sought to liberalize its policies on foreign direct investment; these policies have been the most restrictive of the four East Asian NICs. In the past, the government exercised tremendous administrative discretion over the entry of foreign firms with regard to local participation, management control, and every other aspect of the foreign firms' behaviors. Liberalization has

involved two policy thrusts: (a) a commitment to easing entry and (b) a dismantling of special incentives to foreign firms. In 1984 the move was made from a positive list system, whereby foreign investment was allowed only in designated industries, to a negative list system, whereby all foreign investment is automatically approved unless otherwise specified. Restrictions on the repatriation of principal and the remittance of dividends were lifted.

With respect to the HCI sectors, seven different categories of laws and acts regulating industrial licensing of technology have been abolished to eliminate administrative barriers to entry. Despite strong protests from big business, the government also has curtailed credit to South Korea's largest firms, even though their financial difficulties are due in no small part to past government policies. Lending priorities now give greater emphasis to small and medium-sized firms and to light industry. Tax laws were amended in 1982, abolishing preferential rates for heavy industry and creating a more uniform structure. At the same time, a number of extremely generous tax exemptions extended to foreign firms have been either abolished or scaled back with the aim of equalizing the incentives offered to foreign and local firms.

7.1.2. Government Interference and Implication of Low Interest Rates and Financial Reform

Financial liberalization in South Korea in the 1980s should be seen as part of an overall reorientation in economic policy. The financial system has played an important role in both the distortion and reforming processes and, in so doing, has

itself been changed substantially in structure. As noted in previous chapters, the banking sector had been the most pervasively controlled part of the financial system. The nation's commercial banks did not enjoy full autonomy in extending loans, nor were interest rates on bank loans and deposits freely determined. Rather than based on financial or economic soundness, credit pricing and allocation decisions were for a long time made by bureaucrats, based on national policy considerations. Banks had to be in compliance with financing the heavy industry investment of the HCI drive and carried the major burden of the consequences. Financial repression, direct controls and the national monetary policy were all added to the increased inefficiencies in banks' financing, and deprived banks of autonomy in their fund operations and liquidity management.

The domination of the financial sector by the government has stymied its development in several ways. When the interest rates are fixed below their free market competitive level by the Monetary Board, it had swept away the intermediation function of interest rates. Holding interest rates below the real cost of the financial capital proved to be detrimental to domestic savings mobilization. It also led to a chronic excess in credit demand and made credit rationing mandatory. By minimizing the spread between lending and deposit rates, the Monetary Board had also neglected the profitability of the banks. In the second half of the 1970s, the government used the banking system both to finance directly and to guarantee foreign financing of investment in the heavy and chemical industries. The explicit and implicit backing of industrial investment decisions by

government led to excessive risk-taking and undisciplined financial techniques on the part of both borrowers and lenders. Since banks could not offer commercial loans based on the feasibility and creditworthiness of investment projects, they inadvertently assisted in promoting some of the overheated investments of HCI drive while firms easily became highly leveraged.

In addition at the end of the 1970s, with huge idle capacities, some of the enterprises had difficulty servicing their debt, and the banks accumulated non-performing debt. Bad debts draw heavily on the balance sheets of Korea's five large commercial banks[2]. It has estimated that if assets of banks are written at a realistic level, these banks are technically insolvent. Another weakness of the commercial banks is underdeveloped managerial skills and financial techniques. Bankers rarely had an opportunity to make decisions. Concepts like management efficiency and good decision-making were alien to them. Profitability became an acceptable motive for them only recently.

7.1.3. Financial Reform Measures

Korea proceeded slowly with the deregulation of the banking system where the principal constraint was the weak financial position of commercial banks. The government continues to use financial instruments but has relinquished direct control in favor of indirect control. Steps include increased autonomy for banking institutions, internationalization of the capital market, and promotion of direct foreign investment. In 1983 the government gave up its holdings in the five major

commercial banks in the country. It maintained a presence in the financial sector through continued control of " specialized banks"[3] and regulatory powers, including limitations on test industrial groups' holdings in the new banks and oversight of banks' lending practices. Fiscal reforms eliminated a number of special discretionary funds the government had used to help target industries; thus, the privatization of the commercial banking sector also was intended to signal a move away from targeted lending.

The Korean market also was made more open to the operation of foreign banks. In 1983 a new commercial bank was launched as a joint venture between seventeen South Korean banks and the Bank of America. Initial steps were made toward lifting a number of restrictions on foreign banks and the inability to issue negotiable certificates of deposit (CDs). These reforms have proceeded slowly, but, nevertheless, there has been a move away from the highly interventionist stance the government previously had taken toward the financial sector.

The state also has lifted restrictions on competition among different types of financial institutions, resulting in a dramatic upsurge in the nonbank private financial sector. This includes investment and insurance companies and direct credit markets for corporate bonds and commercial paper. In fact, the shift in financing channels from the highly controlled banks to the less regulated nonbank financial institutions seems to have contributed more to the liberalization of the financial system and the integration of financial markets than did the government's limited efforts at deregulation and the transfer of ownership of the commercial

banks. These institutions, which were not subject to the restrictions governing the commercial banks, attracted large amounts of financial savings and provided much of the new financing to support the growth of the Korean economy. As a result, South Korea is characterized by a segmented financial system that embodies a dynamic non-banking sector and a passive banking sector burdened with large sums of non-performing loans.

7.2. External and Internal Imbalances in Taiwan's Economy, 1980-1988

Liberalization in Taiwan has been gradual which does not necessarily mean it is less urgent than in Korea. Since Taiwan's principal import barrier is high tariffs, in 1983 the government began to reform its customs system and to increase the openness of markets. For example, in 1986 the two highest duty categories were lowered from their respective averages of 48 percent in 1978 and 30 percent in 1983 to 31.77 percent and 22.83 percent, respectively (Hwang, 1991).

The movement toward liberalization in Taiwan has been gradual, especially in the financial area, and has created a number of rigidities of varying degrees of seriousness. These, in turn, have constrained or prevented the timely and commensurate response of investment, output, and other areas of the economy to the demand signals from domestic and international markets. In the following pages, a brief description is given of Taiwan's financial sector during the 1980s.

Due to the government's conservative monetary policy and restrained

intervention, Taiwan achieved an export-led economy with high savings and financial deepening. In the early 1970s, however, difficulty emerged in terms of macroeconomic stabilization or inflation control. There are many reasons for Taiwan's overall economic imbalance during the 1980s. Among them, structural changes in the economy, with the accompanying external and internal imbalances, are the most important.

7.2.1. External Imbalance and Exchange Appreciation

In 1980, Taiwan's balance of trade was approximately equal, with exports and imports each making up 48.5 percent of GNP. In the following two years, however, the rate of exports did not change, but imports dropped sharply. By 1982, Taiwan's trade surplus had reached 7.1 percent of GNP. This trend continued into 1985 and 1986, when the rate of imports again dropped and exports expanded. In 1986, exports comprised 54.3 percent of GNP, imports made up only 33.1 percent, and there was an unprecedented trade surplus of 21.2 percent of GNP (Table 7-1). On the export side, from 1980 to 1982 the Taiwanese dollar depreciated relative to the U.S. dollar and then remained stable. In addition, domestic prices fell. The Taiwanese dollar started to rise in 1986, but the Japanese yen and German mark appreciated further, which actually weakened its effective exchange rate, and the development of domestic import-substitution industries restrained the need for foreign inputs, which comprised 90 percent of the country's imports.

Table 7-1 External Imbalances in Taiwan, 1980-1988

Year	Exports GNP (1)	Imports GNP (2)	External Imbalance (1)-(2)
1980	48.5	48.5	0.0
1981	47.7	44.8	2.9
1982	46.7	39.6	7.1
1983	49.2	39.8	9.4
1984	52.9	38.2	14.7
1985	51.0	33.4	17.6
1986	54.3	33.1	21.2
1987	55.1	35.6	19.5
1988	55.7	45.7	10.0

Source: Council for Economic Planning and Development, Taiwan Statistical Data Book, 1988.

As was shown in Table 2-1, the import volume in Taiwan is much lower than in South Korea; the opposite is true for export volume. A possible explanation is that import substitution for parts in manufacturing has been much more extensive in Taiwan than in South Korea. It is widely known that Taiwan started with parts industries, while South Korea started with large-scale assembly industries (Rhee, 1987).

Whether or not trade imbalances are justified by the economics of international specialization, they attract intervention. In particular, the Taiwanese imbalances generated pressure from the United States for increased trade "reciprocity." Despite several large trade missions which resulted in contracts of more than U.S. $1 billion, no serious dent was made in a trade imbalance with macroeconomic roots. By mid-1986 the locus of attention had shifted to exchange rates. The U.S. Treasury argued that the New Taiwan dollar should be allowed

to strengthen (Cheng and Haggard, 1987). Furthermore, the trade surplus along with the pending appreciation of the N.T. dollar translated problems into other areas, particularly the exchange market.

The value of Taiwan's currency remained quite stable during the 1979-85 period. The foreign exchange system was officially changed from a fixed to a flexible regime in February 1979. When the trade surplus in the 1980s brought a large amount of foreign exchange into Taiwan, the question of how fast and by how much the New Taiwan(N.T.) dollars should be appreciated became the dilemma for officials of the Central Bank. On the one hand, market forces principle dictates that currency should be allowed to appreciate to whatever extent and with whatever speed the market bears. On the other hand, the plea for a stable exchange rate put very strong pressure on the government. General concern about the potential adjustment costs to the trade sector from any drastic change in the exchange market prompted the Central Bank to intervene and adopted a partial liberalization policy that allowed the N.T. dollars to appreciate "gradually" and "smoothly". Consequently, market expectations were not fully satisfied and further appreciation of the N.T. dollar was anticipated. This induced huge speculative capital inflows into the economy and fueled the problems created by the trade surplus. This overall imbalance of payments then transmitted ripples into other areas of the economy.

A direct result of intervention in the foreign exchange market was a drastic increase in the money supply, which left the local capital market awash in liquidity.

This, in turn, fueled inflation in the stock market during 1987-1988 and overheated the local real estate market. At the height of the stock market boom January to September 1987, the weighted stock index in Taiwan rose from 1,150 to 4,459, an increase of more than 300 percent; this translated into a return of 33 percent per month, or 400 percent return per year (Liu, 1992). The steady capital inflows and continuous government intervention in areas such as foreign exchange control of the banking sector and financial system have strengthened the degrees of efficiency loss and greatly distorted resources allocation in the Taiwanese economy. The implications for the economy are evidenced by the internal imbalance between saving and investment, described in the following section.

7.2.2. Internal Imbalance and the Investment Slump

As shown in Table 7-2, from 1980 to 1985 Taiwan's savings rate remained fairly stable at 33 percent; in 1986 it rose to 38.7 percent, and in 1987 it was up to 40.4 percent. From 1980 to 1986, Taiwan's investment ratio fell annually, from 34.3 percent to 15.8 percent. With regard to domestic investment in the 1970's, the government was successful in completing the basic social infrastructure. Seven large harbor projects, two railways, an airfield, a nuclear power plant, and a major expressway claimed a large share of Taiwan's total investment resources over the 1970s. In 1975 and 1976 they accounted for 20% of total government investment. As is apparent from Table 7-3, during 1980-1988 the investment of private and public enterprises and government all decreased, with the greatest

drop in the investment of public enterprises.

As described previously, the investment slump was in no small part due to government intervention in the financial market. Given the prevalent expectation of future exchange rate appreciation, there was little incentive to invest abroad, even with favorable real interest rate differentials between domestic and foreign securities. In addition, the abnormally high rate of return in stocks and real estate channeled large amounts of resources into unproductive and speculative activities instead of productive investment. The result was not only poor domestic resource mobilization through the financial system but also poor overall efficiency of resource allocation in the economy.

Table 7-2 Internal Imbalances in Taiwan, 1980-1988

Year	Savings GNP (1)	Investment GNP (2)	Internal Imbalance (1)-(2)
1980	33.0	34.3	-1.3
1981	32.0	30.5	1.5
1982	30.4	25.2	5.2
1983	32.1	23.0	9.1
1984	33.7	21.3	12.4
1985	33.5	17.6	15.9
1986	38.7	15.8	22.9
1987	40.4	19.2	21.3
1988	34.7	23.6	12.1

Source: (Council for Economic Planning and Development, Republic of China). Taiwan Statistical Data Book, 1988.

Table 7-3 Capital Formation in Taiwan in the 1980s, by Sector, in Percent

Year	Gross Capital Formation GDP	Changes in Stock GDP	Gross Fixed Capital Formation/GDP			
			Total	Government	Public Enterprises	Private Sector
1980	34.3	3.2	31.1	4.6	10.6	15.9
1981	30.3	2.1	28.2	4.3	9.2	14.7
1982	25.2	-1.1	26.3	4.5	8.9	12.8
1983	23.0	-0.01	23.1	3.8	7.3	12.0
1984	21.5	0.0	21.5	3.6	5.6	12.3
1985	17.9	-1.2	19.1	3.6	4.8	10.7
1986	16.2	-2.3	18.5	3.6	4.5	10.4
1987	19.6	-0.02	19.8	3.7	4.4	11.6
1988	23.6	3.2	20.4	4.1	4.2	12.1

Source: (Council for Economic Planning and Development, Republic of China). Taiwan Statistical Data Book, 1988.

7.3. Financial Reform in Taiwan

The Taiwanese state has dominated the financial sector throughout the postwar period and largely retains its tight control most of the time. Banks are mostly government owned. Their staffs are appointed by the government and tend to come from the Ministry of Finance or the Central Bank rather than from the financial community. The structure of interest rates and bank portfolios are subject to government control. Furthermore, a series of financial scandals in 1985 not only led to the resignation of two cabinet ministers but also revealed a number of structural weaknesses in the banking sector: an overly bureaucratic state-owned banking system, a lax and politicized regulatory structure, and a private financial sector simultaneously hamstrung by overregulation and engaged in various illicit dealings (Shea and Kuo, 1985; Wade, 1985).

Due to the huge capital inflows initially induced by the trade surplus and then by the speculative activities the imbalance in trade has been transmitted throughout the economy. In the meantime, global financial deregulation in the 1980s prompted increasing demands for financial deregulation in Taiwan. Interest rate liberalization was the first step in deregulation of the money market. From November 1980 to September 1982, the official interest rate was adjusted ten times to move it closer to the market-determined money market rate (Liu, 1992). Interest rate liberalization was successfully completed by July 1989 with the revision of the Banking Law, and the interest rates on various financial instruments are now determined by market forces.

Since 1982 the government has launched a series of piecemeal reforms of the financial sector. Without the dramatic change in policy strategy adopted in South Korea, Taiwan has tried to reinforce the long-established commercial banks, on the one hand, and foster open markets with respect to domestic finance, on the other. These efforts include a venture capital scheme, a market for bankers' acceptances, steps toward the creation of offshore banking units, and a trust fund that would allow foreign capital to take equity positions in Taiwanese companies. In 1983 the Ministry of Finance allowed foreign banks to take time deposits for up to six months in local currency (Cheng and Haggard, 1987). More important reforms of the financial sector were posited only as long-term goals in 1989. Movement toward the creation of an independent private banking sector and the timing of privatization of the banking system remain unclear; substantial progress still remains to be seen.

CHAPTER EIGHT

SUMMARY AND CONCLUSION

The government of South Korea changed the direction of its economy in the 1980s and reoriented its financial policies. The intent of the shift was to liberalize the financial system in general and the banking sector in particular. The rapid growth in that sector in the 1980s is due to several factors, the most important of which may have been the increase in real interest rates through reduced inflation. The high interest rate also seems to have encouraged domestic savings. In addition, increased competition among financial institutions as a result of privatization and relaxed entry barriers contributed to rapid growth. Less government intervention also led to improvement in the overall efficiency of credit allocation. Consequently, the pattern of growth in the Korean financial sector in the 1980s resembles that in Taiwan and Japan in the 1960s and early 1970s.

In Taiwan there has been some effort to foster the short-term money market, especially through free market interest rates. This has facilitated the development of markets for commercial papers, bank acceptance, and CDs. As a result, the corporate sector's liability has become diversified. Yet, there have not been significant changes in the financial system in Taiwan. Market efficiency still

needs to be enhanced, and market competition needs to be further encouraged; most of the major banks in Taiwan were still government owned as of 1989 and competition within the banking industry was relatively weak. Taiwan also faces strong pressure for deregulation of, and improved efficiency in, the banking system, especially through further development of nonbank financial institutions and the securities market.

The relatively slow progress of liberalization in the 1980s in Taiwan compared with that in Korea may reflect the different internal and external environments it faced. Taiwan, as a net international creditor, probably was less compelled to liberalize the financial system in order to facilitate domestic resource mobilization than was Korea, which became a large debtor in 1980. Whereas the immediate problem in Taiwan was the need for an appropriate monetary managing system, in South Korea the debt crisis, mis-allocation of capital, and inefficiencies of financial institutions added the urgency of financial liberalization.

Since 1986, South Korea faced a problem similar to Taiwan; its current account showed a large surplus after a long period of deficit. Consequently, South Korea also faced great pressure to liberalize foreign exchange and capital account transaction. If the trade surplus continues to be large, there soon must be a move toward liberalizing the domestic financial market. This will result in more pressure for further financial system reform, since without a competitive and liberalized domestic financial system, opening the domestic financial market might be very costly. Both countries now face the challenge of setting up appropriate monetary

and financial policies that not only allow them to secure continuous price stability but also lead to a more competitive and efficient financial system.

There is no doubt that as the industrial sectors mature, a more diversified and competitive financial system is needed. The common challenge faced by South Korea and Taiwan forces the rethinking of the positioning of the state's role in the economy. The more liberal model of structural adjustment calls not only for changing discrete policy but also for dismantling the state's capacity for intervening in the economy. Yet, the strategic view of the state role that has characterized economic growth in both countries is not likely to be abandoned quickly, in part because it has proven quite successful in the past. Liberalization of the old system and movement into new sectors and markets entail uncertainty and risk. Such a major restructuring will not occur quickly. Institutions are notorious of resisting to change. Bureaucratic interests and perceptions are also at stake.

This study has demonstrated the decisive role of each government in affecting the direction and speed of the industrialization process. The analysis also reveals two important implications. First, in light of the results achieved by both countries, success in sustained growth and transformation depends more on domestic capacity to modify economic policies than on the initial conditions of development. Second, the differences between the two countries' experiences on trade, industry policy adjustments, and reforms were characterized by each country's relative emphasis in scope, timing, speed, and other parameters of policy

management. The speed and direction of adjustment is significantly affected by the domestic environment; the domestic political variable is one of a set of important variables that condition the whole process.

With the scale of the economy growing larger and the industrial relationship becoming more complicated and diversified, the market will have to increasingly replace government planning as the mechanism for allocating resources. Experiences of the last four decades in South Korea and Taiwan indicate a relatively better performance from the market. The magnitude of non-market failure has been known to outweigh the market failure and is being demonstrated in this study. The economy has to be ruled by the free interplay of economic agents in the market to enhance efficiency. At the same time, more attention has to be paid to promoting equity among various sectors and groups.

FOOTNOTES

CHAPTER 2. Gross National Product and The Coefficient of Variation: Growth and Stability

1. Unlike the military government in Korea, the KMT has an elaborate ideology based on Dr. Sun Yat-sen's eclectic teachings. Embodied in what was later called the Three Principles for the People (nationalism, democracy, and livelihood, which inspired the Chinese revolution), this ideology was an ingenious blend of Western social and political thought and Chinese traditional philosophy. Among many other enlightening effects on the traditional Chinese, the ideology introduced the concept of the government's responsibility and accountability to its people, the value of political, social, and economic equality, and the importance of participatory democracy.

2. A relatively better market performance from the standpoints of static and dynamic performance. The former stands for allocative efficiency at a given point in time. The latter deals with economic growth and expansion over time.

CHAPTER 3. The South Korean Experience of the 1960s and 1970s

1. Each plan gave priority attention to specific targets for growth rates of GNP, agriculture, industry, trade, investment, savings, social development, social welfare and so on. The technocratic and bureaucratic elites in the state apparatus carried out policies with strong administrative power. The Park regime also reshuffled existing laws and enacted new ones. These included legislation on interests rates and taxes, foreign capital and direct investment, and on setting up industrial estates.

CHAPTER 4. Business Concentration in Taiwan and South Korea

1. In Korea control of chaebol is concentrated in the hands of owner-founders. Unlike the Japanese zaibatsu which have their own banks, the chaebols rely heavily on government-controlled credit institutions.

CHAPTER 5. Foreign Investment and Technological Transfer in Taiwan and the Differences of Foreign Investment Policies Between Korea and Taiwan in the 1980s

1. Criteria for selection into the park are based on a company's design, development, and manufacturing capabilities. According to current policies, the primary objective is to introduce companies to the plans and skills to improve products already developed in the industrialized countries rather than those seeking to develop brand-new technologies. Of the 99 firms in operation, 31 are engaged in computers and peripherals, 9 in optoelectronics, 17 in telecommunications, 24 in integrated circuits, and 4 in bioengineering (Simon, 1992).

2. Perhaps the best testimony to this is the recent establishment of R & D facilities on the island by such Japanese firms as Matsushita, Hitachi, and Sharp.

3. According to Reuber(1973), foreign vertical investment is oriented to export promotion on the basis of advantage assets of the dependent country, such as cheap labor and raw materials, whereas foreign horizontal investment is geared to import substitution on the basis of advantage assets of the dependent country, such as market demand. Thus, MNC subsidiaries focus on the local assembly of various goods in the case of the former, and they integrate local production into the centers in the case of the latter. In terms of "productive life cycle" theory (Vernon, 1966), the latter is more useful in technology transfers than the former.

CHAPTER 6. Development of Machine Tool Industries in South Korea and Taiwan

1. Machines with numerical controls, generally Japanese, now make up a substantial part of capacity in the industry and constitute about one fourth of exports.

2. These include linkages with the rest of the economy, technology intensity, energy consumption, value-added and domestic and export market potential in degree of pollution. Further details for the machinery industry were put forward in the four-year development plan for 1982-1985.

CHAPTER 7. Economic Reform in the 1980s

1. The wide-ranging reforms of CMES were set to achieve three interrelated objectives: continued high growth, price stability, and equity in income distribution. This involved a gradual reduction of fiscal and monetary incentives for export

promotion and agricultural subsidies, a reduction in rural housing loans, and a realignment of investment schemes for heavy and chemical industries.

2. Bankers estimated that the total bad debts of the five NBC are at least twice that of their total capital, which includes paid-in capital, reserves and surplus.

3. These included (1) The Export-Import Bank, which has financed the export of ships and heavy machinery; (2) the Korean Development Bank, which has played a role in the bailout and consolidation of ailing companies; and (3) the Korea Exchange Bank, a key player in the area of trade finance.

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