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7 The Role of the Government in Promoting Industrialization and Human Capital Accumulation in Korea

Joon-Kyung Kim, Sang Dal Shim, and Jun-Il Kim

7.1 Introduction

Korea's economic growth performance in the past 30 years has been cited as an exemplary model of rapid economic development and has been termed an "economic miracle." Lucas (1993) even constructed a model for the occurrence of economic miracles based on the Korean growth example.

Korea started its process of economic development in the early 1960s with a small industrial base and little accumulated capital and technology. The postwar division of the country severed whatever industrial link existed between the north and south, and the Korean War (1950–53) almost completely destroyed the production facilities and infrastructure of the economy. In the 1950s, many foreign observers regarded the Korean economy as hopeless. Until the early 1960s, the economy depended on foreign economic aid, and its per capita income was less than $100, which lagged behind that of many African countries (including Ghana and Kenya), not to mention most Latin American countries. Korea, perhaps with Taiwan, is one of the few countries that grew from poverty to industrial strength comparable to advanced OECD countries.

Identifying the factors behind Korea's fast growth is a task of paramount interest to both policymakers and academic researchers. In academic circles, there has been a renewal of interest in identifying the factors that determine growth after the publication of Romer's paper (1986), which sparked a significant amount of research on "endogenous growth." According to the theory of endogenous growth, one of the key factors generating fast growth is human capital accumulation through learning by doing, or on-the-job training, as well as education. The accumulation of human capital can be accelerated through

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international trade, which expands and diversifies the production frontier and hence provides excellent opportunities for fast learning. Grossman and Helpman (1989, 1990) identified knowledge spillovers from advanced to developing countries as the most important gains from trade. Lucas (1993) stressed the importance of becoming a large-scale exporter, as it allows workers and managers to continue taking on new tasks, which enables sustained learning on the job.

Government assistance can also affect the speed of human capital accumulation. In order to maintain a high rate of learning, people need to change jobs, which necessitates the continuous introduction of new industries and new products, requiring different skills and technologies. But the creation of these new industries is subject to high risks. The government's assistance can encourage private industrialists to undertake new projects by reducing the risk they face. Thus, the diversification of the industrial structure with governmental assistance enables the learning process to continue without being subject to diminishing returns.

The role of governmental assistance has been given little attention in the endogenous growth theory literature. In practice, the most successful economies, such as those of the East Asian countries, were not only big exporters but were those whose governments extensively supported exports and industrialization. This paper attempts to identify the factors behind the rapid Korean growth and interpret the Korean experience within this framework, while giving special attention to the contribution that Korean government policies made in accelerating economic growth. It will also explore the negative side effects of such policies.

The paper is organized as follows: Section 7.2 will discuss the socioeconomic factors that contributed to the Korean work ethic and heightened educational zeal. Section 7.3 will discuss policy measures that were adopted from the 1960s to the 1970s to promote exports and industrialization. Section 7.4 evaluates the effectiveness of these policy measures in accelerating human capital accumulation and economic growth in Korea. It also discusses distributional issues and other side effects of such government interventions, which need to be addressed for the formation of future developmental policies.

7.2 Socioeconomic Factors and Human Capital Accumulation

The socioeconomic environment can affect human capital accumulation. Unlike countries like India, where there is a caste system which precludes a person from advancing in social status, the class distinction between the noble and ordinary people was largely destroyed in Korea during Japanese colonial rule (1910–45). The destruction of the traditional social hierarchy played a major role in motivating Koreans to invest in human capital.

Just before liberation in 1945, 90 percent of industrial assets were under

Japanese ownership, and the rest belonged to a handful of Korean landowners. Between 1949 and 1951, land was distributed to poor farmers through the Land Reform Bill and large landowners disappeared. As mentioned before, most of the industrial and capital base was devastated during the Korean War, resulting in the extreme poverty of all people. As a result, Korea saw an unusual equalization in assets and income in the 1950s and became a rare case among developing countries.

Korea has maintained one of the world's most competitive educational systems, in which access to higher education is determined by a uniform standard. With few exceptions, access is determined by the applicant's score on a national exam—unlike in Western countries where multiple standards such as family background, extracurricular activities, alumni connections, and leadership skills are considered.

Such an environment of equal status with fair competition created great potential for vertical mobility in society: the general public was given almost equal opportunity and strong incentives to move up the "status ladder" by investing in human capital or by entrepreneurial activities.[1] Of course, human capital accumulation and active business promotion at the individual level would have been unlikely if the government had initiated the economic development process within a socialist framework, rather than a capitalist one.[2]

7.3 Government Policies for Industrialization

7.3.1 Export Promotion

From the beginning of the first Five-Year Economic Development Plan in 1962, the Korean government has adopted an export promotion strategy rather than an import substitution policy.[3] The government strongly supported exporting firms with various incentive measures, including favorable treatment in the allocation of credit and in the taxation system.

The system of export financing played a critical role in supporting export industries until the mid-1980s when the Korean current account recorded a surplus. The essence of the system was the Bank of Korea's (BOK's) automatic rediscounting policy, which supplied credit via commercial banks to exporting firms who received letters of credit (L/C). The central bank's discount loans

1. This argument resembles the convergence results in neoclassical growth models in which poor economies with lower capital-labor ratios grow faster than rich countries, converging to the same steady state, other things being equal. In endogenous growth models, however, absolute convergence results are not obtained because steady state growth itself depends on saving rates and other model parameters.

2. In 1960, North Korea dominated South Korea in terms of production capacity and per capita GNP. Such dominance, however, was reversed in the early 1970s.

3. Export promotion was largely dictated by the need to finance the imports required to build up industrial capacity.

Table 7.1 Export Loans by Domestic Money Banks (%)

	1961–65	1966–72	1973–81	1982–86	1987–91
Export loans by BOK (as a share of export loans by DMBs)	n.a.	75.4	90.1	65.8	45.3
Export loans by DMBs (as a share of total loans by DMBs)	4.5	7.6	13.3	10.2	3.1
Export loans by DMBs (as a share of total policy loans[a] by DMBs)	n.a.	n.a.	20.4	16.5	4.5
Export loan interest rate (A)	9.3	6.1	9.7	10.0	10–11.0
General loan interest rate (B)	18.2	23.2	17.3	10–11.5	10–11.5
B − A	8.9	17.1	7.6	0–1.5	0–0.5
Financial subsidy ratio for exports[b]	n.a.	1.6	0.6	0.5	0.2
Annual export growth rate[c]	40.3	37.7	35.1	10.5	16.4
Export/GNP	3.5	9.9	26.2	32.5	30.7

Source: Bank of Korea, *Economic Statistics Yearbook* (Seoul, various issues).

[a]The size of policy loans is estimated for earmarked credit such as export credits, National Investment Fund loans, housing loans, and credit for agriculture, fisheries, and small and medium-sized companies.

[b]The financial subsidy ratio is estimated by dividing the total amount of financial subsidy for exports by the total export value. The amount of financial subsidy is calculated by multiplying the size of export-related loans by the interest rate differential between the average borrowing rate for the manufacturing industry and interest rates for export-related loans.

[c]Annual export growth rate during 1953–60 was 8.2 percent.

were also extended to preshipment exports, as well as to imports of raw materials and intermediate goods for export use and to the purchase of export content from local suppliers.[4]

Table 7.1 shows that most of the export credit extended by domestic money banks (DMBs) were supported by the central bank. Between 1966 and 1986, the annual average ratio of BOK export credits to DMB export loans was 79.4 percent. In particular, the ratio reached 90.1 percent in the 1973–81 period. Table 7.1 also shows DMB export loans as a share of total DMB loans. Between 1961 and 1965, the annual average share was only 4.5 percent. The share increased to 7.6 percent in the 1966–72 period and further, to 13.3 percent, in the 1973–81 period. The share, however, has decreased significantly since the mid-1980s, when the current account surplus began accumulating.

The interest rate on export loans was also heavily subsidized. Until 1981, export loans were provided at rates of 6–10 percent even though general loan rates were 17–23 percent. After 1982, the differential disappeared (see table

4. In addition to this explicitly earmarked export credit program, the government guided the banks through moral suasion, directives, or communication to lend to exporters to support their fixed investment as well as working capital. See Rhee (1989) and Cho and Kim (1993) for a detailed description of Korea's export credit policy.

7.1). Given the facts that the availability of credit was what mattered and that the curb-market rates usually exceeded 30 percent, the preferential treatment given to exporters was far greater than that implied by the above-mentioned differentials alone.

It is interesting to see in table 7.1 that there is some positive correlation between export growth and export loan support, in terms of its availability and the extent of preferential treatment. Between 1961 and 1981, exports grew about 35–40 percent per annum and their share in GNP increased by more than seven times. However, the growth rate has dropped to the 10 percent level since 1982.

Such fast export growth in the 1960s and 1970s was not due solely to these export credit programs. The government also provided substantial tax incentives to exporting firms by reducing business and corporate taxes on export income by 50 percent and exempting tariffs on materials or intermediate goods imported as export content. Furthermore, exporters were exempted from tax investigations, which motivated business firms to restlessly participate in exporting.

In addition to these incentives, there was also a long list of governmental measures for export activity promotion at the microlevel. Since export marketing has substantial fixed costs in the beginning stages, the government established the Korea Trade Promotion Corporation (KOTRA) mainly to explore foreign markets. To assist Korean exporters in effectively filling foreign orders, the government also subsidized projects to improve the wrapping and design of products, the expansion of inspection facilities for export goods, the opening of foreign-language training centers, and traveling expenses for delegations to overseas expositions and trade shows.[5]

The government also initiated close consultation with the export industries and monitored the performance of supported firms through "monthly export promotion expansion meetings," chaired by the president. Ministers with trade-related duties, representatives from business, banking institutions, and shipping companies, and labor-union leaders participated in these meetings to review export performance broken down according to product and destination, and to discuss international market trends and emerging problems. For instance, if export performance was weak, the president urged relevant government officials and bankers to provide enhanced support to achieve a target volume of exports as planned. Through the process of consensus building in these meetings, export promotion policies were systemized (Kim 1990).[6]

Another salient feature of Korean export promotion policies was that the

5. These broad projects were financed from a sort of semitax on domestic exporter's imports, which was operated by the Korea Trader's Association (KTA).

6. The term "Korea Incorporated" was coined mainly because of this unique feature of Korea's export promotion policy implementation: banks acted as a treasury unit, the industrial sector as production and marketing units, and the government as a central planning and control unit (Cho and Hellmann 1993).

government's support to exporting firms was based on export performance. Exporters eligible to receive support were limited to those whose past year's exports exceeded a target amount.[7] To get more privileges, exporters had to work hard to compete with each other and foreign businesses. In this way, the Korean government maintained an efficient allocating device for picking winners and was able to reduce the risk of an "interventionist approach" (Cho and Kim 1993). Furthermore, this strategy compelled Korean firms to compete with foreign firms and brought tremendous externalities of accelerated learning on the job and, thus, a shortened learning curve.

There seems to be little controversy over the fact that these comprehensive export promotion policies contributed to the remarkable expansion of the Korean export sector by stimulating learning by doing. But one may remain doubtful whether the full extent of government subsidies used by Korean policymakers was necessary to kick off export growth.

7.3.2 Promotion of the Heavy and Chemical Industries

From the beginning of economic development, the Korean military government made deliberate efforts to upgrade the industrial structure by promoting the heavy and chemical industries (HCIs). It believed that the build up of the HCIs would lead to a "wealthy country and a strong army." The promotion of the HCIs was carried out despite many critical obstacles: (1) Korea lacked capital and Korea's market was very small, while the HCIs require huge capital investments with long gestation periods and they are sensitive to scale. (2) Technical skills necessary to efficiently produce HCI products were absent in Korea. The Korean government designated the steel industry, along with the petrochemical industry, strategic industries to be given top priority in the second Five-Year Economic Development Plan (1967–71).[8]

In the early 1970s, the promotion of the HCIs was further pushed to sustain export growth. The Korean industrial structure had rapidly transformed during the 1960s from an agrarian economy to a light manufacturing sector–dominated economy. But the government suspected that export-led growth would not be sustained when the light industries' production reached the "effective minimum scale" and their position of comparative advantage in the international market deteriorated.

The HCI drive was also largely motivated by national security concerns, magnified by the Carter administration's plan to completely withdraw U.S. ground forces from Korea and by the fall of South Vietnam to communist rule. In response, the Korean government announced in 1973 that it would promote the HCIs simultaneously with the defense industry.

7. The general trading companies introduced in 1972 had favorable access to various government supports. But their licenses had to be renewed every year. Those that had not exported beyond a certain amount found their licenses revoked. (Cho and Kim 1993).

8. Pohang Integrated Steel Mill (POSCO) and Wulsan Petrochemical Complex were built during the second Five-Year Plan.

The government's key strategy for developing the HCIs was raising factory sizes to international standards, in order to promote their competitive edge. Since the domestic market was too small for these large factories, the government decided that the HCIs were to be promoted as strategic export industries to solve marketing problems and to practice economies of scale (Kim 1990).[9]

The HCI policy was implemented through subsidized credit and special tax policies, selective protection, entry restrictions, and direct government involvement in industrial decision making. The government picked *chaebols* (conglomerates) or firms to enter specific industries.

Among various government supports, financing was the most critical factor since the HCIs required huge amounts of capital. With limited domestic saving, the government had to actively seek foreign capital. At that time, the ability of Korean entrepreneurs to attract foreign capital was very limited due to the low creditworthiness of domestic firms. The government, in response, took two big steps. It began to guarantee the reimbursement of all foreign loans, whether they were initiated by public companies or by private companies. Much more important, the government normalized relations with Japan, despite very strong anti-Japan sentiment and popular protest.[10] These measures facilitated large inflows of foreign capital and technology, especially from Japan.

Table 7.2 shows the allocation of foreign loans by industry. From 1959 to 1982, commercial loans were mostly allocated to the manufacturing industries, especially to the HCIs, while public loans went mainly to the service industry (mostly for infrastructure). During this period, 59 percent of all commercial loans were distributed to manufacturing industries, of which 73.8 percent were allocated to HCI-related projects, indicating that, without easy access to international commercial lending, the HCI plan which required mammoth investment could not have been implemented.

The government also established a special system called the National Investment Fund (NIF) in 1973 to facilitate the financing of long-term investment in plants and equipment for the HCIs. The sources of the NIF were a combination of domestic funds from private financial intermediaries such as commercial

9. In particular, the HCI build-up in parallel with the defense industry was a challenge because production capacity could stay idle in peacetime. In order to prevent unnecessary idle capacity, the Korean government devised a scheme to make use of portions of the capacity of private-operated factories in the HCIs to produce certain parts of weapons. In fact, the government designated 82 large- and medium-sized firms as part-producing factories. Behind this plan lay the government's basic principle that "any weapon could be turned into parts when taken apart," and "when any standard parts were assembled, they turned into weapons with good performance." In order to maintain the sound financial structure of parts-producing factories by not letting production capacity stay idle in peacetime, firms followed a rule that 20 percent of their total production capacity was to be for military use and the rest for civilian use (Kim 1990).

10. The construction of POSCO, which has grown to become the third largest steel company in the world, could not have begun without the reparation fund settled in the normalization treaty with Japan. See Cho and Kim (1993) for the details of the government's financial support of POSCO.

Table 7.2 **Composition of Public and Commercial Foreign Loans by Industry (on the basis of arrival; %)**

	Agriculture, Forestry, and Fisheries	Manufacturing		Service	Total
		HCIs	Light Industries		
1959–66					
Public loan	7.5	11.7	8.3	72.5	100.0
Commercial loan	22.3	43.4	31.4	2.9	100.0
1967–71					
Public loan	42.2	6.8	1.6	49.4	100.0
Commercial loan	3.6	31.6	23.9	40.8	100.0
1972–76					
Public loan	18.2	6.1	0.0	75.8	100.0
Commercial loan	2.2	42.4	23.7	31.7	100.0
1977–82					
Public loan	17.0	1.5	0.3	81.2	100.0
Commercial loan	0.6	46.0	10.6	42.8	100.0
1959–82					
Public loan	19.0	3.0	0.4	77.6	100.0
Commercial loan	1.6	43.6	15.4	39.5	100.0
Total	9.6	24.9	8.5	57.0	100.0

Source: Cha (1986).

banks and insurance companies and government funds, but predominantly the former. During 1974–81, the NIF mainly supplied equipment loans to facilitate construction of the HCIs, specifically the steel, petrochemical, and shipbuilding industries.[11] As shown in table 7.3, the share of NIF equipment loans to HCIs in total equipment loans supplied from the banking sector reached 70 percent at the end of 1970s. Since the mid-1980s, as the construction of the HCIs was mostly completed, the share of NIF equipment loans gradually declined to 11.4 percent at the end of 1991. The NIF also provided a sizeable amount of equipment loans to the electric power industry in order to meet the sharp increase in demand for electricity related to the construction of the HCIs.

Along with massive credit supports, the government overhauled the education and training systems to promote and secure engineers and skilled workers for the HCIs. Training centers, technical high schools, and engineering col-

11. After 1982, most of the NIF loans were supplied to many unspecified firms for the purchasing of domestically produced machinery and postshipment export financing. This change in allocation was caused by the following two factors: First, the need to support factory construction diminished as the HCI plants were mostly completed by the early 1980s, while it was still necessary to support sectors that marketed HCI-related products. Second, as the government's direct promotion of "strategic" firms and industries with preferential credits gave way to more indirect and functional support of unspecified firms after the early 1980s, the mode of NIF operation also changed from firm- and industry-specific support to function-specific support (Cho and Kim 1993).

Table 7.3 **Share of NIF Loans in Total Loans by the Banking Sector (%)**

	HCIs		Power and Gas Industries
Year	Total Loans	Equipment Loans	Total Loans
1974	6.1	25.3	10.8
1976	16.6	54.2	38.2
1978	25.1	70.6	52.7
1980	21.4	67.3	59.9
1982	21.2	64.1	67.3
1984	20.3	55.9	49.5
1986	15.2	36.7	30.7
1988	12.3	26.6	24.7
1990	7.1	14.8	18.1
1991	4.9	11.4	8.1

Sources: Bank of Korea, Overview of the National Investment Fund (Seoul, 1989); Bank of Korea, Monthly Bulletin (Seoul, various issues); Korea Development Bank, Monthly Bulletin (Seoul, various issues).

Note: Loans reported are those oustanding at the end of each year and include loans from the DMBs and the Korea Development Bank.

leges were expanded both in quality and quantity. Specifically, the government imposed vocational training requirements on private sector firms to expand the supply of skilled labor for the HCIs. As a result, the number of in-plant vocational trainees drastically increased in 1976, reaching an annual level of almost 100,000. Large numbers of workers continued to be trained from 1977 to 1980, averaging about 70,000 annually (see table 7.4). The government also introduced a skills licensing system to encourage every Korean worker to possess at least one skill. In addition, for each field of engineering the government actively recruited outstanding Korean scientists abroad and established a modern laboratory where research on the improvement of production technologies was conducted in collaboration with industry researchers and university professors. Industrial parks were built to house the HCIs because (1) HCIs have strong forward and backward linkages among themselves, (2) they require large-scale social overhead capital for water, electricity, and transportation networks, and (3) some of the factories produce a great deal of pollution (Kim 1990).

These concerted efforts by the government helped to institute a rapid change in the industrial structure toward the HCIs. As shown in table 7.5, the share of the HCIs in GDP was only 11.9 percent in 1970, but increased to 26.3 percent in 1980, which exceeded the share of light industry, and the HCI share further increased to 31.3 percent in 1988. The HCI drive also contributed in stimulating import substitution of HCIs. The import coefficient dropped from 36.9 percent in 1970 to 23.7 percent in 1980, and further decreased to 21.6 percent in 1985. Furthermore, the share of HCI products in total exports rose substantially from 12.8 percent in 1970 to 51.4 percent in 1988. These results indicate

Table 7.4 Vocational Training in Korea (thousand persons)

Year	Public Vocational Training	In-Plant Vocational Training
1967	1.5	3.9
1968	7.9	8.1
1969	9.7	8.8
1970	11.5	13.6
1971	15.6	14.7
1972	16.1	11.3
1973	25.1	14.5
1974	27.1	13.2
1975	32.6	42.7
1976	28.8	96.8
1977	14.9	58.7
1978	19.2	73.0
1979	28.6	91.0
1980	31.1	66.2
1981	26.3	48.4
1982	28.1	30.1
1983	24.7	21.0
1984	22.8	20.8
1985	22.6	23.9
1986	22.9	19.0
1987	22.6	14.2
1988	20.7	18.2
1989	20.1	15.0
1990	24.4	25.7
1991	26.0	43.3

Source: Lee (1992).

that Korea has achieved a sort of miracle by developing a full set of industries (the light industries, HCIs, and defense industry) in the short period since 1962, the year of the light industry take-off.

Such a drastic transformation of industrial structure could be regarded as an engine of Korea's high sustained economic growth. It introduced new products in the market and generated technology spillovers to other industries, which accelerated the process of human capital accumulation. Since the HCI drive was pursued with a view to building strategic large-scale export industries, the manufacturers could enjoy scale economies and enhanced technology spillover.

The effect of the HCI drive on growth, however, is not free from controversy. Prevalent criticisms include inappropriate scale choices, excessively capital-intensive investments in targeted sectors, and the retardation of trade and financial liberalization. Nonetheless, the HCIs became the leading export sector in Korea starting in the mid-1980s and large-scale industrial firms with international reputations—POSCO, Samsung, and Hyundai—were developed within

Table 7.5 **Trend of Development of the HCIs (%)**

Industry	1970	1975	1980	1985	1988
		Industrial Structure			
Agriculture/fishery	17.0	12.8	8.3	7.7	6.3
Mining	1.1	0.9	0.8	0.7	0.6
Manufacturing	40.3	50.4	51.0	50.0	52.7
Light	28.4	29.5	24.7	21.7	21.4
HCIs	11.9	20.9	26.3	28.3	31.3
Petrochemical	5.9	10.8	12.6	11.4	10.0
Basic metal	2.0	3.4	5.1	4.9	5.3
Metal/machinery	4.0	6.7	8.6	12.0	16.1
Power/gas/construction	9.8	7.7	10.2	10.4	9.3
Service	31.8	28.2	29.7	31.2	29.4
Total	100.0	100.0	100.0	100.0	100.0
		Import Coefficients[a]			
Light	9.2	10.6	7.3	7.0	8.5
HCIs	36.9	29.5	23.7	21.6	22.5
Petrochemical	23.5	19.7	14.9	17.0	19.1
Basic metal	35.1	27.6	18.9	17.6	20.4
Metal/machinery	50.5	41.7	35.8	26.9	25.1
		Composition of Exports			
Light	49.4	45.6	35.2	30.0	29.1
HCIs	12.8	29.0	38.3	47.5	51.4
Petrochemical	5.4	9.2	9.9	12.4	11.0
Basic metal	1.5	4.0	8.1	5.8	5.1
Metal/machinery	5.9	15.8	20.3	29.3	35.4

Source: Bank of Korea, *Input-Output Tables* (Seoul, various issues).

[a]Import coefficient = (total import/total supply of goods to the market) × 100.

such a short period in part because of the drive. Many also think that, if Korea had not built the HCIs in the 1970s, it may not have been able to take full advantage of the appreciation of the Japanese yen and the world economic boom in the second half of the 1980s.

7.3.3 Government Risk Sharing with Private Industries

Risks and uncertainties have far-reaching implications for economic growth as private firms are not able to invest in high-risk projects. In the absence of a well-functioning financial market which allows the pooling of risk involved in capital investment, one bad draw from a random experiment will drive the investor off the scene. The Korean experience suggests how risk sharing between the government and private firms can affect the process of rapid industrialization and product diversification.

The Korean government has acted as an active risk partner for all industrial firms chosen to participate in strategic projects. In practice, the risk-sharing scheme was established by the state's control over finance. The government

Table 7.6 **Financial Indicators in the Manufacturing Industry (%)**

Year	Ratio of Debt to Equity[a]	Ratio of Interest Expenses to Net Sales	Ratio of Net Profits to Net Sales
1963	92.2	3.0	9.1
1964	100.5	4.9	8.6
1965	83.7	3.9	7.9
1966	117.7	5.7	7.7
1967	151.2	5.2	6.7
1968	201.3	5.9	6.0
1969	270.0	7.8	4.3
1970	328.4	9.2	3.3
1971	394.2	9.9	1.2
1972	313.4	7.1	3.9
1973	272.7	4.6	7.5
1974	316.0	4.5	4.8
1975	339.5	4.9	3.4
1976	364.6	4.9	3.9

Source: Bank of Korea, *Financial Statements Analysis* (Seoul, 1981); quoted from Kim (1991).
[a]Total liabilities/net worth.

owned all major banks, set their interest rates at levels far below market rates, and tightly controlled the allocation of their loans and foreign loans.

As mentioned before, the government fully guaranteed private firms' repayment of foreign borrowing. It revised the Foreign Capital Inducement Act in 1965 to allow government-controlled banks to provide debt guarantees without the approval of the National Assembly. In this way, large inflows of foreign capital were promoted without political interruption, and risky ventures that could not be undertaken by private companies alone could be undertaken with government support.

Furthermore, the government, by controlling financial markets, did not hesitate to bail out whatever strategic firms were financially insolvent. In an economy like Korea's, where the initial accumulation of capital was poor and rapid investment expansion had to be financed by bank credit and foreign loans, firms had highly leveraged financial structures: during the period of initial take-off (1963–71), the Korean manufacturing sector's debt ratio increased more than four times, from 92 percent to 394 percent (see table 7.6). In such a credit-based economy, financial crises would occur with major economic downturns unless some risk-sharing schemes between creditors and borrowers existed.[12]

The most dramatic example of the government's direct involvement in risk sharing with business firms is the Presidential Emergency Decree of August 1972, which declared a moratorium on the payments of corporate debt to curb-

12. In Japan, the "main bank" system helped risk sharing between creditors and borrowers.

market lenders. All corporate loans from the curb market were converted to long-term loans to be paid on an installment basis over a five-year period with a grace period of three years, at a maximum interest rate of 16.2 percent, when the prevailing curb-market rate was over 40 percent per annum. In addition, approximately 30 percent of the short-term high-interest (15.5 percent per annum) commercial bank loans to businesses were converted to long-term loans to be repaid on an installment basis over a five-year period at an 8 percent annual interest rate with a three-year grace period.

Behind this drastic measure was strong pressure from business firms amid the worldwide recession at the end of the 1960s. The situation was aggravated extremely by the devaluation of the Korean currency by 18 percent in 1971. This devaluation, which was prompted by the sharp slowdown in export growth, caused a sudden increase in the cost of foreign debt servicing and created severe financial constraints on firms, especially those who had borrowed heavily from abroad.[13]

The August 1972 decree sharply reduced the interest burden of many debt-ridden firms. The ratio of interest expenses to sales volume for manufacturing firms dropped from 9.9 percent in 1971 to 7.1 percent in 1972 and then to 4.6 percent in 1973 (see table 7.6). As the financial situation of the corporate sector improved, so did the problem of nonperforming loans of banks.[14]

The decree firmly demonstrated that the government would take measures to relieve financial distress when necessary. The government's commitment to risk partnership largely motivated private entrepreneurship and allowed the credit-based economy and its highly leveraged firms to explore risky investment opportunities with long-term objectives in mind.

The decree, however, also had adverse effects. It raised social equity issues as the wealth of the depositors in the curb market and banks was transferred to the corporate sector, especially large firms. The fact that there was no profit-sharing arrangement in return for the wealth transfer created discontent among the public, although this dissatisfaction was suppressed under the authoritarian regime. The problem of moral hazard for corporate firms and banks was no less serious. The government's excessive risk partnership with selected firms caused these firms not only to overinvest but also to depend heavily on the government's protection and support, leading them to give insufficient attention to their investment appraisals. The efficient development of the banking system was also hampered, because as long as the government was willing to rescue firms, banks had little incentive to screen projects and monitor firms.

13. The amount of the debt service increased from $160 million in 1970 to $230 and $455 million in 1971 and 1972, respectively.

14. The economy recovered quickly. Total investment grew by 40 percent, and export growth was almost 100 percent in 1973. The real growth of the economy in the first quarter of 1973 increased to 19.3 percent from 6.4 percent for the same period in 1972.

7.4 Appraisal of Korean Industrialization Policy

We have seen that the remarkable economic growth of Korea was largely a result of rapid human capital accumulation driven by on-the-job training. Government policies greatly contributed to accelerating this process. Export promotion has led to substantial technological spillover, which in turn stimulated learning by doing. Specifically, the promotion of the HCIs as strategic export industries expanded the spectrum of the product mix of the economy and provided domestic producers with an excellent ground for practicing scale economies, which enabled economic growth to be sustained. The government's active risk sharing with private firms significantly contributed to this successful implementation of these policies.

Korean economic success is also a result of strong market competition among private firms. As is well known, the Korean system of resource allocation has used government interventions more extensively than any other successful mixed economy, including other newly industrialized countries. Target industries and firms in Korea were selected by the government rather than by the market. Such government intervention can cause distortive allocations and foster moral hazard problems. But, as exporting firms were competing in the international market, they had strong incentives to remain cost effective. The potential inefficiencies that may arise from the government's extensive interventions were reduced because those selected firms needed to pass market tests to survive in the international market. In addition, the government tried to link the amount of assistance to the performance of individual firms in the market. This practice of picking winners has helped to avoid adverse incentives that may arise along with the provision of governmental assistance.

Although the Korean approach in the 1960s and 1970s has been effective in achieving rapid expansion of industrial investment and development of private entrepreneurship, it was not costless. The government's excessive risk sharing and assistance to target industries raised social equity issues. It also put a heavy burden of nonperforming loans on the banking system. The seriousness of such adverse effects, which had been boiling beneath the surface, was recognized by the government by the end of 1970s. It prompted the government to shift its policy stance from unbalanced to balanced growth.

In early 1980s, the government first reduced the scope of its financial support for exporting industries. Interest subsidies on export loans, mainly for large firms, as well as the number of qualified large firms eligible for policy loans were reduced. On the other hand, the support for previously disadvantaged sectors such as small and medium-sized companies (SMCs) and housing were substantially increased.[15] In particular, the emergence of a current account surplus and the political democratization during the second half of the

15. The government tightened the required ratio of the SMC loans out of banks' total loans (see table 7.7) and introduced the National Housing Fund (in 1981) to finance investment in housing for low income class households.

Table 7.7 **Domestic Money Bank Required Ratio of SMC Finance (%)**

Bank Type	1965	1976	1980	1985	1986	1992
Nationwide commerical banks	30[a]	30[b]	35[c]	35	35	45
Local banks	30[a]	40[b]	55[c]	55	80	80
Foreign bank branches				25	25	25

[a]Ratio in terms of total loans outstanding.

[b]Ratio in terms of increase in total loans.

[c]Ratio in terms of increase in total loans in won.

Table 7.8 **Loans to SMCs and 30 Largest *Chaebols* by Domestic Money Banks (%)**

Loan Destination	1983	1985	1988	1989	1990	1991
Loans to SMCs	33.1	31.5	48.1	50.1	55.5	56.8
Loans to 30 largest *chaebols*	n.a.	n.a.	23.7	20.7	19.8	20.4

Source: Bank of Korea, internal memorandum.

1980s spurred social demand for equity, which forced the government to further assist the SMC sector while abolishing policy loans for large corporations.[16] This step led to a sharp increase in the portion of bank loans to the SMCs as a percentage of total bank loans, from 33.1 percent in 1983 to 56.8 percent in 1991, while gradually reducing the share of bank loans to the *chaebols* (see table 7.8).

Such a reversal of policy to one with more a political than an economic orientation was caused by the absence of a prearrangement for sharing the returns realized from privileges bestowed to selected sectors by the previous government. The presumed strategy was to enlarge the pie first and distribute it later. But the strong authoritarian government (1961–79), which was able to promote growth actively, collapsed before the completion of a fair distribution of the pie. Because the democratic government was faced with difficulties in redistributing the returns, it allowed privileges to new interest groups with strong voices. Such rent-seeking behavior by interest groups discouraged competition in the market and directed resources away from productivity growth. Furthermore, it significantly undermined the traditional values and work ethics

16. Since 1988, large corporations have been completely excluded from export credit programs. At the same time, reflecting severe public criticism against the economic concentration within the *chaebols*, the government began to strictly restrict *chaebols*' financing and investment. For instance, the basket control of the credit system (credit ceilings) on large business groups was introduced in 1987 to limit the share of bank loans going to the nation's 30 largest *chaebols*. On the other hand, the BOK applied a preferential rate of rediscounting the SMC bills, and the government established a structural adjustment support program for the SMCs in 1988 to promote R&D and business transformation of the SMCs.

which have been crucial for the accumulation of human capital. These two adverse effects eventually led to a significant erosion of international competitiveness of the Korean economy starting in the late 1980s.

Lucas (1993) claimed that the quicker the introduction of new products into the economy, the quicker the process of learning by doing. The Korean experience strongly suggests that a government can play an important role in sustaining human capital accumulation through learning on the job and economic growth. Such dynamic gains in growth, however, may be at least partially offset by distributional problems that arise in the industrialization process unless a profit-sharing or ownership-sharing scheme is prearranged. From a long-term view, a second-best welfare-enhancing scheme would be to design industrial policies along with an adequate tax policy for income redistribution at the outset. Kim (1988) showed that in the presence of credit market failures, lump-sum taxes-cum-transfers along with governmental direct financial support for private firms can generate an economic growth rate that is higher than it would be without collective efforts by the government and the private sector.

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Comment

Chia Siow Yue

This is a very interesting paper, containing many insights on the Korean economic miracle. The paper aimed at identifying the factors behind Korea's rapid economic growth, relating the Korean growth experience to endogenous growth theory, and evaluating the role of government policies, particularly export promotion and industrial policies.

My comments focus on a number of areas. First, there appears to be considerable overlap between this paper and Chong-Hyun Nam's paper (chap. 6 in this volume) on the role of trade and exchange rate policy in Korea's economic growth. To minimize overlap, perhaps the authors could focus less on export promotion policies and more on policies pertaining to human capital accumulation and investment. And it would have been enlightening if the authors had provided some quantitative evidence on the sources of economic growth in Korea and had shown the importance of human capital accumulation and economies of scale as stressed by endogenous growth theory. Nam's paper showed that, using Denison's growth-accounting approach, more than half of the economic growth in Korea could be explained by increases in labor and capital factor inputs. He did not estimate the contribution of human capital accumulation, as distinct from labor, but found that economies of scale accounted for about 20 percent of economic growth.

Second, discussion on the factors explaining Korea's economic success could be expanded to provide greater insight, in view of the widespread interest in the economic performance of Asia's newly industrialized economies (NIEs), and possible lessons for the developing world. The paper left unclear the role of extensive government intervention in Korea's success, nor was there evaluation of the appropriateness of various government policies pertaining to industrial targeting, manpower development, and technology acquisition and development.

Third, the authors attempted to correlate human capital accumulation and international trade and concluded that Korean economic growth was well explained by sustained human capital accumulation plus strong export promotion. What remains unclear is the role of foreign direct investment and technology imports. Also, what explains the Korean zeal for education? Part of the incentive structure for human capital accumulation, as described by the authors, is the government's role in providing vocational training as well as imposed training requirements on private firms. The emphasis on vocational training is reflected in the high percentage of trained craftsmen among blue-collar workers. Secondary school enrollment is an inadequate indicator of human capital accumulation, as it omits the role of training and falls short of measuring the efficiency of the formal educational system. Based on years of schooling alone, the Philippines should have a better record of economic

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growth performance among East Asian countries. Labor efficiency also depends on the educational curriculum, on-the-job and off-the-job training, labor-management relations, and work ethics. It is to be noted that the Asian NIEs placed high priority on vocational, technical, science-based education and training to produce an efficient industrial work force. Commentators have also drawn attention to the absence of industrial strife as a factor contributing to labor productivity and competitiveness in the Asian NIEs. Education expenditure ratios probably underestimate human capital accumulation, as they ignore forgone labor earnings of students and private expenditures by families to supplement the educational services provided by formal schools, such as on private tuition.

Fourth, Lucas was cited as emphasizing the dynamic gains from trade in accelerating the learning process through continuing introduction of new tasks for workers and managers; the speedier the introduction of new products and industries into the economy, the speedier the learning and growth. Is there an optimal learning path? Would accelerated industrial upgrading through industrial policy lead to premature obsolescence of skills? Does the age profile of Korea's industrial work force affect worker attitudes toward industrial restructuring and commitment to training? How prevalent is job hopping in Korea and do high labor turnovers affect management's commitment to providing training?

Fifth, the authors rightly drew attention to the advantages of the export orientation strategy in opening up larger markets for Korean firms, so that they benefitted from scale economies, while access to technology and a more competitive environment promoted efficiency. The discussion on export promotion policy is enlightening in showing the extent to which the Korean government used macro- as well as microtools. The latter may be unique to Korea among East Asian economies, extending to measures of export targeting by product and country and to conferring decorations and medals on outstanding performers. A key to the success of export subsidies in inducing Korean firms to improve performance is the direct linkage of subsidies to export performance, thus ensuring that subsidies go to the most efficient rather than the least efficient exporters. For a more complete picture of the export promotion policies pursued by Korea, the authors may wish not only to focus on the system of subsidized credit allocation, but also to make reference to the roles of the preferential tax system and exchange rate policy.

Sixth, the authors pointed out that the policy of promoting heavy and chemical industries (HCIs) in the early 1970s was greatly motivated by national security concerns and described the comprehensive financial and market support measures to divert resources to the HCIs, resulting in the rising shares of HCIs in GDP, import substitution and exports, and the technological spillover to other industries. Critics of East Asian industrial policy have drawn attention to the high cost of the HCI program to Korea. The negative experience with the HCIs and growing concern with economic concentration and social equity as

well as external pressures have led the Korean government to reorient its industrial policy away from industry- and firm-specific credit and tax measures and support of *chaebols* to function-specific measures such as support of R&D and support of small and medium-sized enterprises.

Seventh, the authors emphasized the importance of risk sharing between government and private enterprises and highlighted the role of the Korean government in guaranteeing the foreign debt repayments of the private sector and bailing out financially insolvent firms. Apart from the issue of economic concentration and social equity, the poser is how Korea managed to provide such support for its industries and firms without undermining its economic performance, while many countries have gotten into serious economic difficulties for doing likewise.

Finally, will the convergence postulated by the neoclassical growth model lead to a slowing down of the Korean growth rate? Will political democratization and the greater demand for social equity in the 1990s hasten the process of slowdown? The authors noted that noneconomic factors have dominated Korean economic decision making, with rent-seeking behavior by new interest groups and erosion of work ethics undermining Korea's international competitiveness. They advocated the design of industrial policies with a pie-splitting arrangement at the outset. The unanswered question is how the pie sharing is to be decided. Perhaps the authors could elaborate in what they meant by the "design [of] industrial policies along with adequate tax policies for income redistribution at the outset."

Comment

Hak K. Pyo

Kim, Shim, and Kim's paper reviews the past development policies taken by the Korean government in the context of new growth theory. In the first part of the paper, the authors emphasize the positive role played by the Korean government in accelerating human capital accumulation and promoting knowledge spillover through export promotion. In the second part, they discuss risk sharing between the government and firms in Korea and sectoral balance and redistribution policy during the period 1982–92 and attempt to draw the implications of this changing policy direction to the future course of economic growth in Korea. The paper concludes by arguing that industrial policies need to be designed along with a pie-splitting arrangement at the outset.

The linkage of the first part to endogenous growth models is straightforward. However, the paper lacks a statistically meaningful analysis of how the Korean government initiated investment in both education and export industries in the

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early period of economic development with scarce resources. The question remains as to why only Korea and Taiwan succeeded while many other developing countries failed. What was the nature of Korea's endowed human capital at the beginning of economic development?

In addition, the authors need to update their literature survey with both new growth-theoretic empirical studies such as Sengupta (1991, 1993) and more recent growth accounting results on Korean data such as Kim and Park (1988) and Pyo et al. (1993). An empirical analysis of human capital accumulation and on-the-job training at the industry level or firm level would greatly strengthen the authors' argument.

The main problem I find with the paper is its second part. The linkage of the analysis to endogenous growth theories is ambiguous and confusing. The authors need to explain how risk sharing between the government and firms and the redistribution policy recently pursued by the Korean government would fit into the framework of *new growth models*. There are neither theoretical explanations nor empirical references in the paper.

For example, the authors claim that the government should establish at the initial stage a transparent system of fair distribution of returns realized from the selected projects. I cannot find any endogenous growth theory which addresses this dilemma—the government selecting projects while ensuring a fair distribution scheme. At the end of the paper, they also argue that government support should be financed from the budget, minimizing as much as possible the risk of rent seeking by interest groups. They need to explain why budget financing necessarily minimizes the risk of rent seeking and, if so, how it fits into the framework of endogenous growth theories.

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