Professor Wonhyuk Lim

SCHEDULE

Monday, 6 December 2010

11:05 p.m.	Arrival in Manila (KE 623) Check in at Discovery Suites

Tuesday, 7 December 2010

9:30 – 9:55 a.m.	Meeting with Mr. Juzhong Zhuang Deputy Chief Economist, concurrently Assistant Chief Economist, Economics and Research Department (ERD), ADB [Room 7212W]
10:00 – 10:25 a.m.	Meeting with Mr. Xianbin Yao Director General, Regional and Sustainable Development Department, ADB [Room 4112E]
10:30 – 11:30 p.m.	ERD Seminar on "Challenges in Industrial Upgrading: Lessons from the Republic of Korea" [ERD Conference Room 7217/18N]
12:00 – 1:30 p.m.	Lunch hosted by Mr. Juzhong Zhuang (with Mr. Yao and ERD Management) [ADB Executive Dining Room, Special Facilities Block]
2:00 – 2:30 p.m.	Courtesy call on Mr. Jaejung Song Executive Director for the Republic of Korea [Room 9144N]
3:00 – 4:00 p.m.	Meeting with ERD staff. This will be an open discussion to exchange and share research interests and topics. [ERD Conference Room 7217/18N]

Wednesday, 8 December 2010

12:25 p.m.	Departure from Manila (KE 622)

5

Joint Discovery and Upgrading of Comparative Advantage: Lessons from Korea's Development Experience

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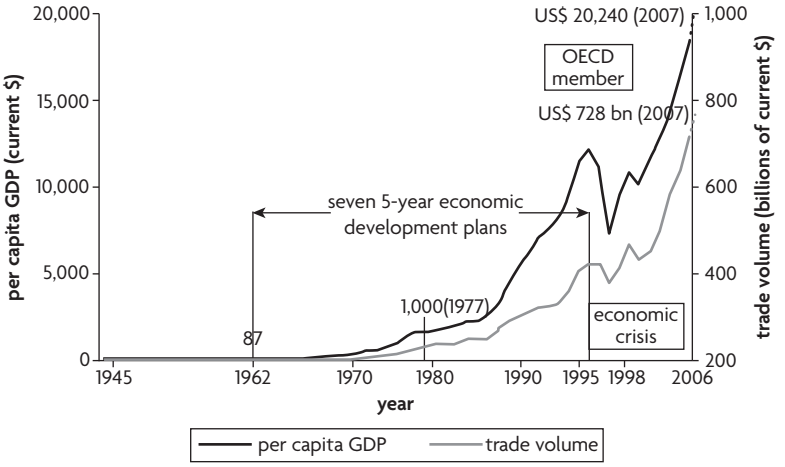
The Republic of Korea's development experience over the past half-century has been a source of inspiration for developing countries. Indeed, as the dramatic increases in Korea's trade volume and per capita gross domestic product (GDP), shown in figure 5.1 suggest, Korea may represent the face of hope "for all those countries who want to radically transform the social and economic conditions of their people in the course of a single generation."[1] One of the poorest countries in the world at the beginning of the 1960s, Korea became a member of the Organisation for Economic Co-operation and Development (OECD) in 1996. Even among successful countries characterized by sustained high growth,[2] Korea stands out with its impressive industrial upgrading and ability to recover quickly from shocks.

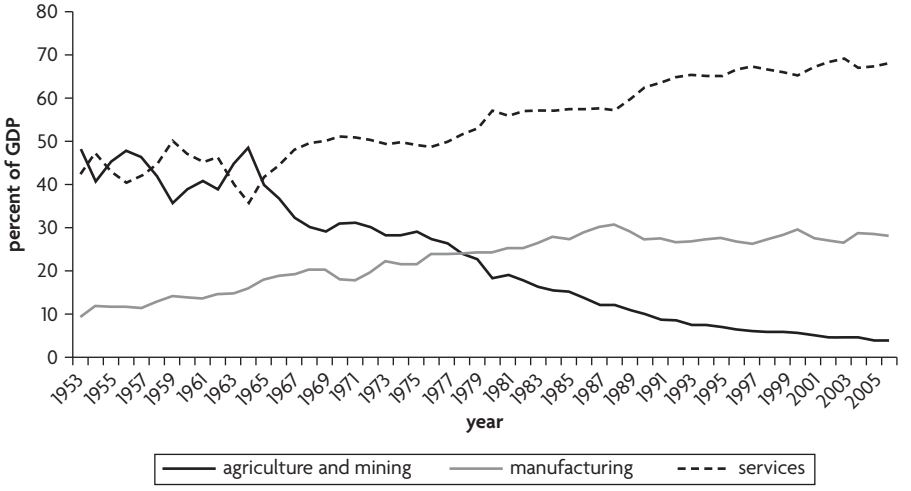
In fact, unlike some countries caught in "a middle-income trap," Korea managed to achieve export-led growth, not just export growth, by transforming its economic structure and systematically increasing the domestic value added or local content of its exports. As figure 5.2 shows, the share of manufacturing in Korea's GDP more than doubled as Korea was able to improve agricultural productivity and reallocate workers

Figure 5.1. Korea's Journey from Poverty to Prosperity



Source: Author.
Note: Korea's trade volume (right axis) and per capita GDP (left axis) are both given in current U.S. dollars.

Figure 5.2. Sectoral Composition of Korea's GDP

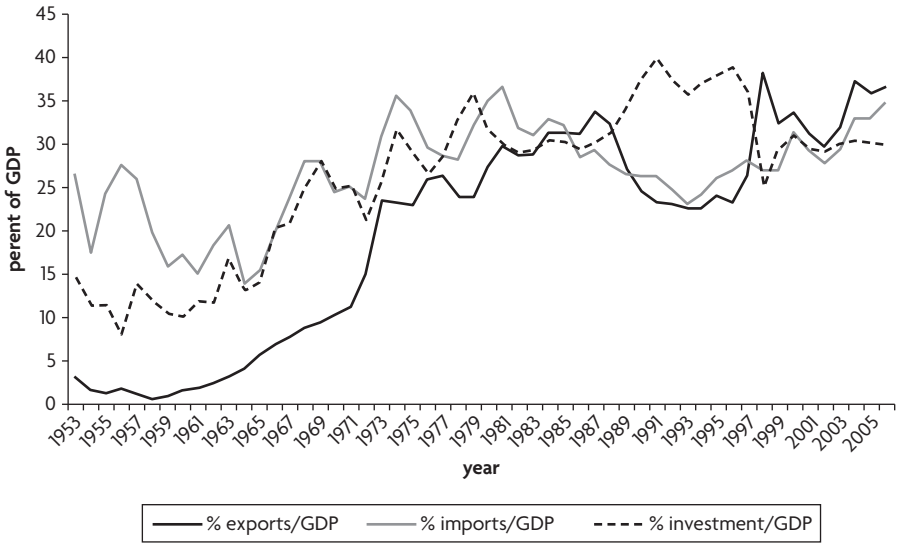


Source: Bank of Korea.

from the primary sector. Moreover, as figure 5.3 shows, Korea's exports and imports rose in step with investment, suggesting that incentives for these activities were strengthened in a similar manner.

Korea's development experience also has been a source of fascination and contention for economists. Both the neoclassical school and the

Figure 5.3. Korea's Exports, Imports, and Investment Relative to GDP



Source: Bank of Korea.

statist school have cited the example of Korea in support of their theories. Neoclassical perspectives typically trace Korea's economic success to a set of market-oriented macroeconomic reforms in 1964 and 1965 (Krueger 1979), whereas statist perspectives point to the pervasive distortion of microeconomic incentives ("getting the prices wrong") by the Korean government and argue that such government intervention promoted rapid economic growth (Amsden 1989; Rodrik 1995). As these competing explanations indicate, Korea's case has been a rather important single data point in development debates. While discussing the evolution of "big ideas" in development economics, Lindauer and Pritchett (2002) note that "because Korea grew so rapidly for so long, any big idea had to encompass Korea before it could become conventional wisdom."[3] Extracting "correct" lessons from Korea's development experience is thus not only a formidable intellectual challenge but also a high-stakes game.

Development is conceptualized in this chapter as the result of synergies between enhanced human capital and new knowledge involving complementary investments in physical and social capital. Three major challenges for development are innovation, coordination, and institution of performance-based reward system. There may be multiple paths

to development, depending on how the state, nonstate actors, and markets interact with each other to address innovation and coordination externalities. The respective roles of the state, nonstate actors, and markets in meeting these challenges may shift over time, reflecting changes in their capacity as well as historical and political economy factors.

This chapter places Korea's development experience within this conceptual framework. For Korea the discovery and upgrading of its comparative advantage through international benchmarking, public-private consultation, and peer-to-peer learning has been critical to its development. The memoirs from the architects of Korea's development, in fact, emphasize the role of performance-oriented leadership and suggest that export-oriented industrialization and human resource development, as encapsulated in the slogans "exportization of all industries" and "scientization of all people," capture the essence of Korea's approach.[4]

This chapter analyzes how Korea addressed innovation and coordination externalities while containing negative government externalities to promote development. The chapter first introduces a conceptual framework that emphasizes the centrality of innovation and coordination externalities and increasing returns for development. It then places Korea's development experience in context by looking at its initial conditions. The next sections focus on Korea's discovery of its comparative advantage and analyze the political economy of Korea's transition to export-oriented industrialization in the early 1960s[5] and look at Korea's efforts to upgrade its comparative advantage, especially in conjunction with its heavy and chemical industry drive in the 1970s. The chapter then discusses the problem of transition from an authoritarian developmental state to a democratic market economy since the 1980s and concludes with lessons for developing countries drawn from Korea's experience.

Conceptual Framework for Development

Development may be conceptualized as the result of synergies between enhanced human capital and new knowledge, involving complementary investments in physical and social capital.[6] Two breakthroughs distinguish "modern growth" characterized by sustained improvement in productivity and living standards: the emergence of a large group of people who absorb and assimilate knowledge to improve their human capital

and in turn use their improved human capital to apply and generate knowledge to raise productivity;[7] and the expansion of markets and hierarchies to facilitate specialization and coordinate productive activities, through the invisible and visible hands.[8] In short, innovation and coordination externalities and increasing returns are central to modern growth, which can overcome the Malthusian trap.

The critical importance of knowledge for development begs the question of how it should be produced, disseminated, and utilized. Not only is knowledge a public good characterized by nonexcludability and nonrivalry,[9] but it is something like an evolving organism that grows through accumulation, synthesis, and innovation. Institutions that encourage autonomy, diversity, and experiment are critical to sustained knowledge production and economic growth.[10] The public good nature of knowledge poses a policy challenge: Unless supported by the public sector, the private sector is likely to underinvest in the provision of knowledge, but excessive state intervention is likely to stifle autonomy, diversity, and experiment that are essential to the growth of knowledge. How can the public sector work with the private sector to overcome this dual problem?

Moreover, the importance of complementary investments suggests that coordination problems may be formidable, especially when markets are underdeveloped.[11] The standard "big push" line of argument calls for the state's coordinating role in promoting the concurrent development of upstream and downstream industries when these industries depend on each other to be viable. As Stiglitz (1996) and others have noted, however, coordination failure can be addressed through trade to some extent: It is possible to develop steel-using industries simply by importing steel without developing a steel-producing industry—and without the state coordinating investment in "a big push," even though transaction costs involved in ensuring reliable and timely supplies of inputs may constrain the effectiveness of international trade as a coordinating mechanism. Moreover, individual firms, such as large business groups, may be able to internalize coordination externalities to a certain extent. However, as long as there are essential intermediate inputs that cannot easily be traded or internalized, the state's coordinating role may be justified. To a large extent, education, research and development (R&D), and physical and institutional infrastructure may qualify as such nontradable and

noninternalizable intermediate inputs.[12] In particular, although the synergies between enhanced human capital and new knowledge are critical to development, investing in people by itself may not be enough. It has to be a part of a comprehensive and integrated program to facilitate economic transformation if it is to contribute to sustained growth instead of unemployment and emigration among the highly educated. Constrained by underdeveloped markets in the early stages of development, a country as well as a firm may have to rely heavily on nonmarket measures to reduce transaction costs and coordinate productive activities (Coase 1937; Williamson 1975).

Placed in this context, which emphasizes the role of innovation and coordination for development, the long-running "state-versus-market" debate in economics had better be restructured in a more pragmatic and less ideological direction.[13] Externalities in the provision of knowledge and coordination of productive activities *can* justify state intervention. The fundamental policy challenge is for the state to work with nonstate actors and markets to address innovation and coordination externalities while minimizing negative government externalities. Certainly, through incompetence and corruption, some governments may create more problems than they solve, but "getting the government out of the way" does not help resolve innovation and coordination externalities. It basically amounts to throwing the baby out with the bathwater. Instead of dismissing the state from the outset, it would be more constructive to examine what needs to be done to increase competence and reduce corruption on the part of the state as it deals with innovation and coordination externalities.

At the most basic level the state must set up a professional bureaucracy combined with an effective monitoring system to ensure that incompetence and corruption do not become a self-fulfilling prophesy. For instance, recruiting government officials through meritocratic examinations rather than personal ties would go a long way toward improving state capacity. It is also important to define basic principles in legal enforcement and policy implementation and strike a balance between rule versus discretion in achieving these principles.

A solution to the development challenge should include an incentive system that uses markets and institutions to provide rewards based on individuals' contributions to society in a competitive setting, in a way that

addresses information and incentive problems and achieves social cohesion. A performance-based reward system, under the principles of the protection of property rights and the equality of opportunity, has to be an integral part of this institutional framework. The reinforcement of successful experiments through the feedback mechanism of performance-based rewards can lead to dramatic changes over time. While a regime that facilitates resource mobilization can be effective in a catch-up phase of development, an institutional platform that fosters autonomy, diversity, and experiment is critical to sustained productivity-led growth.

Dynamically, the development of markets (and their supporting institutions) reduces at least some innovation and coordination externalities over time, and the importance of autonomy, diversity, and experiment in sustaining growth also restricts the extent and mode of state intervention. These restrictions should be shaped by three factors: the development of markets to coordinate productive activities, the level of state capacity (that is, competence and integrity) to address externalities, and the availability of nonstate actors (such as business groups) to internalize externalities. Clearly, as the capacities of the state, nonstate actors, and markets change over time, the implied normative restrictions on the extent and mode of state intervention should also change; however, path dependence may affect this dynamic and create a problem of transition (David 1985; Arthur 1994). There may be multiple paths to development (Rodrik 2007), depending on how the state, nonstate actors, and markets interact with each other to address innovation and coordination externalities.

Korea's Initial Conditions

Natural Endowment and Historical Context

Korea is a medium-sized, densely populated, resource-poor, and peninsular country in northeast Asia. If reunified, Korea would be the 84th largest country in the world with a total territory of approximately 220,000 square kilometers—slightly smaller than Britain. Reunified Korea would also be the world's 17th most populous country, with a population of more than 70 million—slightly larger than France. The Republic of Korea by itself, with a territory of 100,000 square kilometers and a population of 50 million, comes in at No. 108 and No. 25, respectively—similar to Portugal in size and to Spain in population. Although Korea is by no

means a tiny country by global standards, its location next to China, Russia, and Japan, makes it look like "a shrimp among whales" by comparison. Korea's poor natural resources and limited arable land only reinforce this conventional wisdom, even though resource abundance per se is not as important for development as access to inputs at international prices in an increasingly connected global economy.

Korea achieved national unity and established a centralized rule in the 10th century, a remarkably early date by any standard. Characterizing Korea's centralist tendencies as "the politics of the vortex," Henderson (1968, 2) noted: "Few if any traditions affecting an entity of this size have operated in so uniform an environment of race, culture, and language, within geographic boundaries so stable or a political framework so enduring. Few states eliminated local power so soon or so completely and sustained centralized rule in such unchallenged form so long." In this regard, Korea's traditional political and social structure was rather different from that of Europe or Japan, which operated in a feudal system. A pyramid-like structure, with the central government at the apex, characterized Korea's social organization for more than 1,000 years. While the state maintained centralized rule in traditional Korea, however, the monarch typically shared power with influential aristocrats or scholar-officials. What may be called "centralized oligarchy" rather than absolutist rule characterized the political structure of traditional Korea (Henderson 1968; Palais 1975).

In the economic sphere, the government traditionally allowed little room for merchants or other groups to pursue moneymaking ventures on their own. In fact, during the Yi (also known as Chosun or Choson) Dynasty (1392–1910), the social hierarchy consisted of Confucian literati, farmers, craftsmen, and merchants from top to bottom. The only legitimate route to the top of the social hierarchy was to pass state examinations and join the ranks of scholar-officials. These state examinations were highly competitive and meritocratic; in practice, however, it was difficult for the offspring of the non-elite to find the necessary time and resources to prepare for these examinations. Thus, in the traditional Korean context, with few alternative sources of power available, both economic development and stagnation had to be state-led (Cha and Lim 2000). Ideally, "the best and the brightest," selected through state examinations, could take advantage of Korea's homogeneity and centralization

to mobilize resources for development. Alternatively, the elite scholar-officials at the center could easily exploit mass society and engage in factional rent-seeking competition. In this case, the masses would have little choice but to acquiesce in resignation, revolt against the officials despite the odds, or leave the country in search of a better life.

Isabella Bird Bishop (1897), a traveler-writer who visited the Korean Peninsula as well as a Korean settlement in the Russian region of Primorsk in the 1890s, saw a dramatic contrast between the lives of the Korean people in the two places and came to appreciate that it was governance, not innate culture, that accounted for the difference. With a hint of racism, she wrote:

> The suspiciousness and indolent conceit, and the servility to his betters, which characterize the home-bred Korean have very generally given place [in Russia] to an independence and manliness of manner rather British than Asiatic. The alacrity of movement is a change also, and has replaced the conceited swing of the *yang-ban* and heartless lounge of the peasant. There are many chances for making money, and there is neither mandarin nor *yang-ban* to squeeze it out of the people when made, and comforts and a certain appearance of wealth no longer attract the rapacious attentions of officials, but are rather a credit to a man than a source of insecurity….
>
> In Korea I had learned to think of Koreans as the dregs of a race, and to regard their condition as hopeless, but in Primorsk I saw reason for considerably modifying my opinion. It must be borne in mind that these people, who have raised themselves into a prosperous farming class, and who get an excellent character for industry and good conduct alike from Russian police officials, Russian settlers, and military officers, were not exceptionally industrious and thrifty men. They were mostly starving folk who fled from famine, and their prosperity and general demeanor give me the hope that their countrymen in Korea, if they ever have an honest administration and protection for their earnings, may slowly develop into *men*.

The exploitation of the peasants and the failure to mobilize resources for the nation's modernization set the stage for the Japanese colonial occupation of Korea (1910–45). The Japanese initially attempted to develop Korea as a supplier of rice and a buyer of Japanese manufactured products. Subsequently, as Japan set its sight on China in the 1930s, it developed the northern part of Korea as an industrial base to

support its invasion. According to Suh (1978), Korea's agriculture, forestry, and fishery sector grew annually at 2.1 percent from 1910 to 1940; whereas the mining and manufacturing sector grew at 9.5 percent over the same period. The two sectors taken together (that is, excluding construction, utilities, trade, and services) grew at 3.2 percent. Overall, Korea's per capita commodity product grew annually at 1.6 percent from 1910 to 1940.

Under the Japanese colonial rule, Korea heavily depended on trade. Most of Korea's trade during the colonial period was with Japan. In the 1930s Japan accounted for 84.5 percent of Korea's total trade volume and Manchuria under Japanese occupation, another 10.5 percent (National Statistical Office 1995). The basic pattern of trade was for Korea to export food and raw materials and import finished goods, because the colonial industrialization mostly focused on light manufacturing for domestic consumption. The share of food and raw materials in Korea's exports decreased slightly from 86.3 percent in 1910 to 80.8 percent in 1940; whereas the share of finished goods in Korea's imports increased slightly from 56.3 percent to 62.4 percent over the same period (Song et al. 2004).

Post-1945 Chaos and Crony Capitalism of the 1950s

The end of the Japanese rule in 1945 was followed by the de facto partition of the Korean peninsula by the American and Soviet forces along the 38th parallel. The nation became the battleground for an internationalized civil war from 1950 to 1953, pitting South Korea and the United States against North Korea and China, with the Soviet Union in the background.

Syngman Rhee, the first president of the Republic of Korea, rose to power within this political context. A Princeton Ph.D. and longtime exile in the United States, Rhee had pro-independence and anticommunist credentials but lacked a domestic power base. He initially allied himself with the Korea Democratic Party, which was created by wealthy landowners and businessmen. After he formed his own Liberal Party, however, he took a variety of measures to weaken his potential competitors and consolidate his power base. For instance, the land reform launched in 1949, in response to a previous effort in the Democratic People's Republic of Korea, was designed in part to reduce the political power of landowners (J. Kim 1975). In fact, Rhee's use of policy instruments to

gain political support played a dominant role in a succession of economic decisions during his presidency (1948–60).

The end of the Japanese colonial rule meant that the "enemy properties" of the Japanese and their collaborators had to be either nationalized or sold off and that the rules governing trade and foreign exchange had to be modified to deal with the vacuum created by the severing of relations with Japan. Furthermore, given the lack of domestic capital and technology, policies designed to attract foreign investment had to be implemented. In this regard, Korea's economic situation after liberation was similar to that of Central and Eastern European countries after the collapse of the Soviet Union in the late 1990s. In addressing these policy challenges, however, Rhee took a rather myopic approach. Instead of formulating a broad-based development program, he chose to use the discretionary allocation of state-controlled resources to secure and sustain his political supporters.

After the outbreak of the Korean War, the United States reassessed Korea's geostrategic importance and provided generous assistance. In fact, foreign aid financed nearly 70 percent of total imports from 1953 through 1962. The aid was equal to nearly 8 percent of gross national product (GNP). Net foreign savings, as measured by the current account deficit, averaged 9 percent of GNP over the same period (Mason et al. 1980).

Rhee used the discretionary allocation of foreign exchange and aid goods, import licenses, and government contracts as instruments to consolidate his power base. U.S. aid goods provided raw materials for Korea's "three-white" industries of the 1950s: sugar, cotton yarn, and wheat flour. Rhee's politically motivated "industrial policy" created huge profit opportunities. The cost of producing a sack of wheat flour was estimated at 350 hwan,[14] but a select group of domestic manufacturers were able to charge 1,200 hwan a sack, and shortages sometimes pushed prices to 5,000 hwan (S. Kim 1965, 27–30). As long as U.S. policy toward Korea was dictated by geostrategic imperatives, Syngman Rhee could rely on the continued flow of U.S. aid to sustain his regime (Haggard 1990).

The sale of vested properties ("enemy properties") provides another good example. The government set the terms of the privatization in favor of the politically well-connected, and in return for their windfall

gains, business leaders made contributions to Rhee's Liberal Party. The Rhee government typically set the assessed value of the vested industrial properties at 25–30 percent of the market value.[15]

The Rhee government also intervened heavily in foreign trade, especially in the first half of the 1950s. As part of its foreign exchange control program, the government instituted an extensive system of import restrictions, designated a group of products as desirable exports, and gave their exporters licenses to import restricted items. Thus, a particular group of exports were linked to a particular group of imports (Cha 2002). Unfortunately, this system had the effect of discouraging businesses from discovering promising new exports because the list of desirable exports designated by the government mainly focused on primary products such as tungsten and sea laver (seaweed). The government intervention in trade was reduced after it agreed with the United States in August 1955 to bring the official exchange rate in line with the market rate. The adjustment of the exchange rate was not sufficient to persuade businesses to develop promising exports, however; instead, as the link between exports and imports was phased out, businesses focused on importing manufactured products, which offered a higher level of profitability than exports (Cha 2002).

In the end, what passed for an economic system in Korea in the 1950s was primarily shaped by Rhee's use of policy instruments to secure and sustain his power base. The sale of vested properties resulted in windfall gains for favored business leaders and an undue concentration of economic power. Technocrats genuinely concerned with economic development received little support (H. Kim 1999).

When a student protest in April 1960 finally put an end to the Syngman Rhee government, Korea was in a dismal state. It was an aid-dependent country whose per capita income was one of the lowest in the world. As table 5.1 shows, Korea's per capita GDP in 1960 was lower than such Sub-Saharan African countries as Senegal—to say nothing of most countries in Asia and Latin America. The savings rate was less than 10 percent of GNP. The government derived over half of its revenue from U.S. aid; tax collection was less than 10 percent of GNP, which was low even by the standards of developing countries. Manufacturing constituted only slightly more than 10 percent of GNP. The unemployment rate was around 8 percent.

Table 5.1. Comparative Growth Experience, 1960–2004

Country	Per Capita GDP in 1960 (2000 US$)	Per Capita GDP in 2004 (2000 US$)	Average Annual Growth Rate (%)
Ghana	412	1,440	2.84
Mozambique	838	1,452	1.25
Senegal	1,776	1,407	–0.53
Korea	1,458	18,424	5.76
Malaysia	1,801	12,133	4.34
Philippines	2,039	3,939	1.50
Sri Lanka	866	4,272	3.63
Taiwan	1,444	20,868	6.07
Thailand	1,059	7,274	4.38
Argentina	7,838	10,939	0.76
Brazil	2,644	7,205	2.28
Mexico	3,719	8,165	1.79
United States	12,892	36,098	2.34

Source: Penn World Table 6.2: Variable: Real GDP Per Capita (Chain).
Note: Data for Brazil, Malaysia, Mozambique, Senegal, and Thailand is for 2003 rather than 2004.

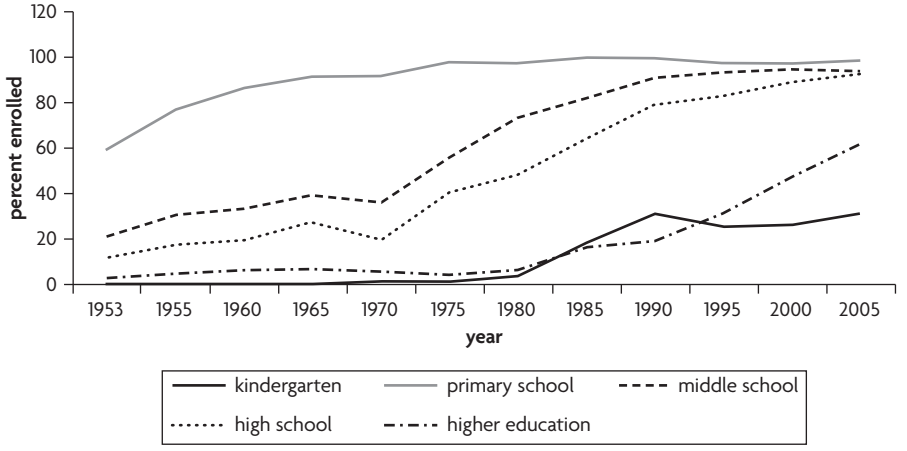
In fact, in a cross-country study on economic development, Perkins (1997) notes that Korea had a rather unusual economic structure in the early 1960s. The share of agriculture and mining in Korean GNP was close to 50 percent, nearly 15 percentage points higher than the average of other countries of comparable size and per capita income. The share of manufacturing was unusually low, nearly 20 percentage points below the average. Even more remarkable was the extremely low share of exports, which amounted to only 3 percent of GNP, when the average was about 15 percent. This was a dramatic departure from the 1930s and the early 1940s, when Korea's exports amounted to about 30 percent of GNP. The Rhee government's myopic policy was largely responsible for turning a trading nation into an aid-dependent near-autarky. Overall, Korea appeared to face bleak prospects.

In hindsight, however, a closer examination of Korea's situation in the 1950s reveals some strengths that would become critical to its subsequent development. First, crony capitalism or not, Korea had a vibrant private sector where entrepreneurs were seeking profit opportunities to expand their businesses. In fact, many of Korea's family-based business

groups, known as the *chaebol,* were established in this period.[16] Second, Korea had a fairly cohesive and egalitarian society characterized by high social mobility and cultural and ethnic homogeneity. Although corruption was widespread, the state had a basic bureaucratic apparatus to maintain social stability. In addition, although the national division at the end of World War II had led to the Korean War, Korea did not suffer from ethnic fragmentation or tribal rivalry that would beset many newly independent countries. Moreover, the collapse of the traditional hierarchy, combined with the leveling effect of the land reform and war, basically placed all Koreans at the same starting line and encouraged them to believe that they could advance in society if they dedicated themselves to education and hard work. That had tremendous implications for human resource development.

The most important development, however, was the great improvement in education during the 1950s (see figure 5.4). Korea's primary school enrollment rate had been only around 45 percent at the time of liberation from the Japanese colonial rule in 1945. With the introduction of universal primary education in 1950, Korea's primary school enrollment rate increased from 59.6 percent in 1953 to 86.2 percent in 1960. The high-school enrollment rate increased from 12.4 percent in 1953 to 19.9 percent in 1960. The illiteracy rate dropped from 78 percent in 1945

Figure 5.4. Korea's School Enrollment Rate



Source: Ministry of Education.

to 28 percent in 1960 (McGinn et al. 1980). Although investing in people by itself was not enough to promote growth in the absence of complementary industrial and trade developments, it provided the basis for Korea's subsequent takeoff.

Discovering Korea's Comparative Advantage

Changes in Political Economy in the Early 1960s

The early 1960s saw two dramatic events in Korea's political economy: the student revolution of April 1960 and the military coup of May 1961. These two events highlighted the government failures of the past and ignited a passionate national debate on development and modernization. In the changed political atmosphere, whoever came to power had to present a new vision for the nation and back it up with a strategic plan. Although it remained to be seen whether this new vision would indeed work, the sense of hopelessness that pervaded the 1950s was replaced by rising expectations.

On April 19, 1960, students staged demonstrations against the Syngman Rhee government in protest of election irregularities and corruption. The use of force against student protesters encouraged citizens to take their side, and within a course of a week Rhee had to step down to prevent further bloodshed. The student revolution, based on a long tradition of protest by young students and scholars, showed that the Korean people were fed up with crony capitalism.

The new, democratically elected Chang Myun government (August 1960–May 1961) tried to cope with various political demands following the student revolution and to formulate a coherent program to promote economic development. It prepared a five-year economic development plan as well as a blueprint to establish a senior ministry in charge of economic development that would have planning and policy coordination as well as budgetary functions (H. Kim 1999). In addition, the Chang government sharply devalued the Korean currency in January and February of 1961 to bring the official exchange rate close to market rates (Frank, Kim, and Westphal 1975). The Chang government also reestablished the practice of recruiting civil servants through meritocratic examinations. Under the previous Rhee government, civil service recruitment had been based on political and personal connections

(Lee 1999). The new merit-based bureaucracy, with a strong work ethic, would prove critical to Korea's subsequent economic development (Hasan 2008).

However, the Chang government's efforts to build growth-promoting institutions were short-lived. On May 16, 1961, General Park Chung Hee seized power through a bloodless coup. An ambitious and complex figure, Park had served as a Japanese army officer and, after Korea's liberation, he organized communist sympathizers in the Korean Army before he converted to the cause of anticommunism. In the Revolutionary Pledges of May 16, Park and his followers declared that they were determined to "focus all energy into developing capability to confront communism, in order to realize the people's long-standing wish for national unification." Park's overriding concern was the communist regime in the Democratic People's Republic of Korea, which had successfully carried out a series of reconstruction and development programs after the Korean War. Park acknowledged that the Republic of Korea was facing a formidable adversary who was winning the economic war, which he felt took precedence over military or political war (C. Park 1963). In fact, in the early 1960s the North's per capita income was estimated to be double that in the South, and it was feared that the income gap was growing between the two sides. Park believed that rapid economic growth and improved living standards would provide the best antidote for communism and decided to channel all national energy into economic modernization. Other issues, such as political liberalization and national unification, were pushed aside.

Although Park and his followers had only rudimentary knowledge of economics, they believed that the state should take a leading role in development. To monitor the economy on a daily basis, Park established an economic secretariat in the presidential mansion. Implementing an idea that had been around for some time, he also created the Economic Planning Board (EPB) in July 1961 through a merger of several policy-making functions of different ministries. The EPB took over the budgetary function from the Ministry of Finance and the collection and evaluation of national statistics from the Ministry of Internal Affairs. The EPB was charged with the task of formulating and implementing five-year economic development plans, and in 1963 it became a bona fide superministry headed by a deputy prime minister (H. Kim 1999).

In addition to these institutional innovations that centralized economic policymaking, the military government took several measures to strengthen the role of the state in resource allocation. After the April 1960 student revolution, prominent businessmen were accused of having grown rich through political connections with the Syngman Rhee government. Taking over the task of dealing with these "illicit wealth accumulators," the military government accused them of tax evasion and other illegal business practices, demanding and receiving their equity shares in commercial banks in lieu of fines. This drastic measure paved the way for the government to exert direct control over commercial banks.

The government also created a number of "quasi-governmental organizations" to facilitate communications with business and labor. Various business associations were used as channels for government-business interaction and were granted special favors such as the right to allocate import quotas among member firms. Membership in these business associations was mandatory. As for labor, all labor unions were disbanded following the 1961 coup, and the restructured Federation of Korean Trade Unions was forced to take a moderate stance.

In a little more than a year, the military government thus established various levers of control. Although the size of the state—as measured by the share of government spending in GNP— remained relatively small, the power of the state was overwhelming. Park and his followers clearly had in mind an economic system that was dominated by the state. The question remained as to what kind of state-led system it would be.

Transition from Inward-Looking to Export-Oriented Industrialization

The military government initially tried to pursue inward-looking industrialization under the principle of "guided capitalism." According to the First Five-Year Plan (1962–66) released by the Supreme Council in July 1961, the government would take charge of investment in manufacturing. According to this plan, Korea would earn hard currency by exporting *primary* products and undertake massive investment projects in such *basic* industries as steel and machinery.[17] The plan insisted that such a development strategy based on the idea of "industrial deepening" was the only way to achieve economic self-reliance (Kimiya 1991).

Intended or not, these economic policies bore a striking resemblance to those adopted by Latin American countries (Bruton 1998). In the 1950s Korea had operated a de facto import-substitution regime, marked more by cronyism than developmentalism. Now it seemed that Korea was about to adopt a development-oriented import-substitution regime. A series of "historical accidents," however, prevented this outcome and led the military government to switch to an export-oriented system. Strong economic pressure from the United States and decisive reaction from the fiercely nationalistic Korean leaders played a critical role in this dramatic transition.

Once the United States had recognized the new military government in Korea, the U.S. authorities were supportive of the development-oriented Park and his followers, but they became increasingly alarmed as the military government pursued an ambitious program of "industrial deepening." The American experts advised the Korean government to invest in infrastructure and make the most of human capital and existing factories instead of carrying out massive projects in heavy industries. The military government, however, pushed ahead with its industrial deepening program, trying to obtain capital for such projects as an integrated steel mill (Kimiya 1991).

In June 1962 the Korean government even implemented a currency reform program without prior consultation with the United States. Through a compulsory deposit-for-equity swap measure, a certain portion of existing deposits were to be converted into equity shares in a new Industrial Development Corporation, which would then use these captured domestic savings to invest in heavy industries. The military government would guarantee an annual dividend return of 15 percent on these shares. The Americans were not amused. Critical of the antimarket nature of this measure and insulted by the lack of consultation, the U.S. government forced the Park government to lift the freeze on deposits by threatening to postpone economic assistance (C. Kim 1990).

The U.S. aid leverage was strengthened by a poor harvest and a foreign-exchange crisis in Korea in the second half of 1962. The U.S. officials took full advantage of the situation to demand major economic reforms and also to press the military leaders to stick to their commitment to restore an elected regime by 1963. To secure an adequate supply of grain for the coming months, the Korean government had little choice

but to acquiesce to these demands (Mason et al. 1980). In December 1962 the Korean government revised the First Five-Year Plan to reflect major changes in economic policy,[18] but the lessons were not lost on the Korean policy makers. Reassessing the import-substituting industrialization strategy that they had initially favored, Park and his followers began to search for radically different policies that would save them from ever being trapped in such a vulnerable position again.

Park Chung Hee certainly knew that it would take a monumental effort to overcome aid dependence. Deploring that Korea had to depend on U.S. aid for 52 percent of the supplemental budget in 1961, Park (1963) noted: "Though nominally independent, the real worth of the Republic of Korea, from the statistical point of view, was only 48 percent. In other words, the U.S. had a 52 percent majority vote with regard to Korea, and we were dependent to that extent…. It showed, dramatically, that our government would have to instantly close down if the U.S. aid were withheld or withdrawn." Park (1963) added: "From 1956 to 1962, we have received, on the average, some 280 million dollars of economic aid each year and some 220 million in military aid. In addition, we have run a current account deficit of 50 million dollars. In other words, excluding our military sector, 330 million dollars should be earned annually to keep the Korean economy on a self-sufficient footing. Then, there is the additional problem of feeding the growing population, increasing at an annual rate of 2.88 percent or 720,000 newborns." In 1962 Korea's total exports were only US$54.8 million. Thus, to secure a sufficient level of hard currency, Korea would somehow have to find a way to increase exports more than six times over. In the end the Park government would go far beyond the orthodox policies prescribed by the Americans and adopt drastic measures to promote exports in its effort to secure economic and political independence.

The Park government implemented three interrelated sets of economic policies that came to define the Korean model of development. First, the government accommodated the U.S. demands and instituted a set of macroeconomic reforms designed to stabilize the economy. Second, the government adopted drastic measures to share the investment risks of the private sector, providing, in particular, explicit repayment guarantees for foreign loans extended to private sector firms. Third, Park himself spearheaded the effort to boost exports, offering various incentives based on

market performance. The resulting government-business risk partnership, for which the export market performance of private firms was used as a selection criterion, defined the core of what later came to be known as "the Korean model."

The macroeconomic reforms ensured that Korea's state-led development model would be a market-based one. Building on the stabilization policies of 1963–64, the government devalued the Korean won from 130 to the dollar to 256 to the dollar in May 1964. Moreover, the previous multiple exchange rate system, which had applied different rates according to the type of goods and their uses, was converted to a unitary floating foreign exchange system to reflect the actual value of the won. In addition, partial import liberalization and duty drawback, designed to allow Korean firms to purchase intermediate goods at world prices, gave an additional impetus for exports. Also, to protect depositors from inflation and to encourage domestic savings, the government raised the ceiling on the one-year time deposit rate from 15 percent to 30 percent on September 30, 1965 (C. Kim 1990).[19]

These orthodox macroeconomic policies were accompanied by unorthodox measures that introduced distortions into microeconomic incentives. The key issue in the early 1960s was financing. As table 5.2 shows, the domestic savings rate was less than 10 percent, and Korea had to attract foreign capital to finance more than half of its investment needs. Consequently, Korea adopted proactive measures to facilitate foreign financing and earn hard currency through exports.

The Park government knew that Korea lacked the domestic resources to carry out its ambitious economic development program, but unlike Latin American countries at the time (or Southeast Asian countries in the

Table 5.2. Investment and Savings in Korea, 1962–1981
(percent)

Category	1962–66	1967–71	1972–76	1977–81	1962–81
Annual GNP growth	7.9	9.7	10.2	5.7	8.4
Investment/GNP	16.3	25.4	29.0	31.0	25.4
Domestic savings/GNP	8.0	15.1	20.4	25.5	17.3
Foreign savings/GNP	8.6	10.0	6.7	5.6	7.7
Foreign savings/investment	52.8	39.4	23.1	18.1	30.4

Source: Economic Planning Board.

1980s), it was not willing to depend heavily on foreign direct investment.[20] Seeking to tap into foreign capital while limiting the influence of foreign multinationals, the government decided to rely on foreign loans, which would allow Korea to take advantage of the domestic-international interest rate differential and be the residual claimant on its investments—if it successfully paid back the loans.[21]

Because domestic firms at the time lacked the credit in the international market to raise capital on their own, however, the government decided to guarantee private sector foreign borrowing.[22] The government thus took it upon itself to resolve the information asymmetry problem for international financial institutions, which at the time were certainly not willing to spend the time and energy on examining the credit worthiness of Korean firms. This state guarantee became effective *after* Korea established a track record of earning hard currency through exports and paying back foreign loans; a state guarantee by a country with a poor credit rating obviously would not have much weight. The state guarantee was extended to foreign financial institutions providing loans to Korean firms, *not* to the owner-managers of these Korean firms, but subsequent developments in the 1970s blurred this distinction (Lim 2000).

In taking this measure, the Park government signaled that it was willing to form a risk partnership with the private sector. That was a significant shift for the government from its earlier disdain for Korea's business leaders, but the government apparently concluded that combining state monitoring with private entrepreneurship would be the most effective means of carrying out the economic development plans. Through direct monitoring and performance-based support, the government tried to contain the potential costs of state-backed debt financing. All foreign loans had to be authorized by the government and were allocated according to the policy priority of investment projects. Korean companies seeking foreign loans had to apply for approval from the Economic Planning Board. The Ministry of Commerce and Industry provided its opinion to the EPB on the technological merits of projects seeking loans. The Ministry of Finance, for its part, reviewed the financial status of borrowing firms. Through the Deliberation Council for Foreign Capital Mobilization, the EPB then determined the appropriate amount of foreign loans for each application, based on policy priorities.

With a view toward securing economic and political independence, Korea also introduced a number of export promotion measures. To provide institutional support in the area of foreign marketing and technology imports, the government established the Korea Trade Promotion Corporation (KOTRA) in 1962 while an elaborate network of exporters' associations provided more industry-specific services (D. Kim 2008). The short-term export credit system had been streamlined as early as 1961. The essence of the new system was the automatic approval of loans by commercial banks to those with an export letter of credit, which allowed businesses to have access to trade financing without having to put up collateral.

The government also gave exporters various tax deductions, wastage allowances, tariff exemptions, and concessional credits. For example, exporters were entitled to automatic import rights and to easy customs clearance. They also were allowed to import more inputs than was essentially needed as "wastage allowance" to a certain level. Given that the value of imports was still very high, this helped to increase the profitability of exports. The interest rate on export loans was also subsidized from the mid-1960s to the beginning of the 1980s (Cho and Kim 1997). The role of Korea's export subsidies should not be exaggerated, however. According to Frank, Kim, and Westphal (1975), the average effective rate of subsidy on total exports in the second half of the 1960s was basically offset by the degree of currency overvaluation. More important, this subsidy, consisting of internal tax exemptions, custom duties exemptions, and interest rate reductions, took the form of a performance-based reward in a competitive setting rather than a handout with no strings attached. For instance, eligibility to receive export credit support was limited to only those whose past year's exports exceeded the target amount specified in the loan contract.

Strong export performers even received medals and national recognition on Export Day, which was established in 1964 to commemorate the day when Korea's annual exports exceeded US$100 million for the first time (C. Kim 1990). Traditionally at the bottom of the social hierarchy, merchants were now presented through this annual event as patriotic entrepreneurs contributing to the nation's modernization.

After Korea's annual exports reached US$100 million, the minister of commerce and industry asked Park Chung Hee to chair monthly export

promotion meetings, and after a few trial runs in 1965, the president chaired these meetings on a regular basis from January 1966. Attended by high-ranking government officials and business representatives, monthly export promotion meetings provided a forum to monitor progress and devise institutional innovations and solutions to emerging problems. At each monthly meeting, the minister of commerce and industry gave a progress report on export performance by region and product relative to the targets set out in the annual comprehensive plan for export promotion.[23] The minister of foreign affairs gave a briefing on overseas market conditions. Government officials and business representatives then tried to identify emerging bottlenecks and constraints that impeded export performance and devise solutions to these problems. Subsequent meetings monitored progress. Export insurance was one of many institutional innovations that were introduced as a result of recommendations from monthly export promotion meetings (Shin 1994). In short, these meetings between the government and private sector provided opportunities to secure sustained attention from top leadership, monitor progress on a long-term vision, and detect and mitigate constraints as they emerged. Government officials had to come prepared to respond to queries from the president and business representatives. These meetings provided a real-time forum to demonstrate their competence—or lack thereof.

In addition, the Export Promotion Special Account Fund was established within the Korea International Trade Association in 1969 as a public-private initiative to secure nongovernment funding for export promotion activities. It provided support for collective activities such as the dispatch of delegations to international trade fairs, improvement of design and packaging, and establishment of quality certification facilities. A small levy was imposed on imports to provide the funding (C. Kim 1990).

On the huge electronic billboard mounted on top of its building, KOTRA posted the daily and year-to-date export figures. The government opened an Export Information Center, ran an Export Idea Bank to solicit new ideas, and undertook studies to explore promising export products and markets. In these ways the government, industries, and related support institutions came together to promote exports (Shin 1994). With the booming world economy, these efforts resulted in Korea's

exports increasing at an average annual rate of 35 percent in real terms from 1963 to 1969.

Exploitation of Latent Comparative Advantage

Although the adoption of export-oriented industrialization in the 1960s was dictated more by historical accident than foresight and design, it proved an efficient choice given Korea's endowment structure at the time. In 1965 the primary and secondary school enrollments in Korea were similar to the rates in countries with three times its per capita income (World Bank 1993). Korea's efforts to improve education since 1950, combined with lagging industrial and trade development in the 1950s, had created a huge education-income gap. Cheap and high-quality labor could be readily employed to produce a high rate of return on investment in labor-intensive manufacturing, if Korea could only tap into foreign capital and technology to compensate for the shortage of domestic resources and exploit its latent comparative advantage.

In fact, what Korea did in the 1960s was to correct for both government and market failures of the past, which had made it virtually impossible for firms to exploit comparative advantage. The student revolution of 1960 and the military coup of 1961 dramatically reduced corruption and rent-seeking in Korea. The government's decision to provide repayment guarantees to foreign financial institutions on their loans to Korean companies helped to address imperfections in the international capital market. In addition, the government alleviated coordination problems by making inputs available at international prices for exports and providing essential infrastructure such as electricity. In other words, international trade helped to mitigate the need to promote a concurrent development of downstream and upstream industries. Compared with coordination externalities, innovation externalities constituted much less of a problem in the early stages of development because Korea could readily import mature technologies embodied in machinery and equipment. With the government addressing coordination challenges as well as governance problems, Korean firms could invest and export to take advantage of unexplored profit opportunities.

Although the government did identify labor-intensive manufactures as holding a great promise for exports, on the whole, export promotion policies in the 1960s did not target specific industries or firms when

providing incentives. Overcoming the initial export pessimism ("Who would buy our products?"), Korea let comparative advantage operate and focused on labor-intensive industries.[24] It imported raw materials and capital goods and used its cheap, high-quality labor to manufacture exports such as textiles and footwear, instead of rushing to promote basic industries as the Park government had initially wished to do— against Korea's latent comparative advantage in the early 1960s.

The adoption of the new economic system based on export-oriented industrialization encountered little resistance. The influence of policy makers attached to Syngman Rhee's corruption-prone system had been drastically reduced in the wake of the 1960 student protest and the 1961 coup. The politicians associated with Syngman Rhee's regime were thrown out of office and put on trial. The military government, while not totally free from corruption, certainly could not advocate a return to crony capitalism and had to formulate a coherent program of economic development to shore up its legitimacy. Initially, some members of the military government argued for an "industrial deepening" strategy, but they were removed from the top posts after the United States raised strong objections. In the end the technocrats and business leaders advocating an export-led growth strategy had few competitors in policy-making circles in the Park government. The performance-based reward mechanism inherent in the export-oriented industrialization strategy added to its legitimacy, reinforcing successful experiments and phasing out unsuccessful ones in producing goods and services for the global market. The new Korean economic system proved a popular choice in political economy terms as well. In this regard, it is important to note that for a nation that has a comparative advantage in the labor-intensive sector, as Korea did in the 1960s, export orientation can improve the welfare of workers. An accidental product of strong U.S. pressure and nationalistic Korean response, the economic system could thus secure wide support.

Upgrading Korea's Comparative Advantage

If Korea's transition to export-oriented industrialization in the early 1960s had mostly to do with discovering its latent comparative advantage based on the large existing education-income gap, Korea's subsequent

development had more to do with upgrading its comparative advantage with a view toward increasing the domestic value added or local content of its exports. Although international trade helped Korea to overcome the limits of the small domestic market, Korea was well aware that outward orientation by itself was not enough to sustain growth. Starting in the second half of the 1960s, Korea made conscious and concerted efforts to move into higher value added areas along the value chain by making complementary investments in human capital and infrastructure.

Rural Development and Industrial Upgrading

In drafting the Second Five-Year Economic Development Plan (1967–71), Korea tried to build on the accomplishments of the First Five-Year Plan and devise solutions to emerging problems in order to secure sustained growth. In the mid-1960s, Korea still sought to achieve basic food security. At the same time, as an industrializing economy, Korea had two sets of new concerns: a widening urban-rural income gap, and a low level of local content in its exports.[25]

During the Second Five-Year Plan period, Korea addressed the urban-rural income gap by launching the New Community Movement, or Saemaul Undong. Previous rural development programs had focused only on changing the mindset of farmers or providing material incentives, and after the failure of these one-sided programs, the government decided, in 1970, to take a comprehensive and integrated approach (Goh 2005). The core elements of the Saemaul Undong included community empowerment under the principles of "diligence, self-help, and cooperation"; peer learning and inspiration; and performance-based support from the government. In 1970 the government provided each of 33,000 villages with 335 bags of cement, each weighing 40 kilograms, and let each village decide how to use the cement for the good of the community. Mobilizing voluntary local labor, some villages built bridges and others reinforced river embankments; however, a number of villages did not do much with the free cement. In 1971 the government provided 500 bags of cement and 1 ton of reinforced steel to only those villages with substantive accomplishments in the first year. Subsequently, the government provided more incentives such as electrification to those villages that had demonstrated their willingness to make in-kind contributions to improve their communities. In addition, the government arranged

study tours and training sessions so that villages could benchmark other villages with similar endowments. This peer-learning mechanism, combined with the community empowerment and performance-based reward system, was critical to the success of the Saemaul Undong. It served as an effective scaling-up mechanism. In addition, to improve rural income, the government linked the Saemaul Undong with other programs. The green revolution introduced new improved varieties of rice and other crops; whereas, the "white revolution" provided vinyl houses (greenhouses), which made it possible to grow vegetables out of season. A dual grain price system, through which the government procured rice at higher prices than it subsequently sold the rice for, further supported rural income, even though it increasingly became a fiscal burden. Thanks to these efforts, Korea was able to eliminate its urban-rural income gap by the mid-1970s and maintain social cohesion (J. Park 1998; K. Chung 2009).

In the second half of the 1960s Korea also launched an outward-oriented "industrial upgrading" program. Compared with the aborted, inward-oriented "industrial deepening" program in 1962, the new program recognized the link between industry and trade and explicitly adopted a science and technology agenda. In pursuing industrial upgrading, Korea systematically studied what had to be done to fill the missing links in the domestic value chain and move up the quality ladder, and made conscious and concerted efforts to aim for international competitiveness from the outset. In this regard, Korea was different from many developing countries that ambitiously rushed to promote upstream industries without requisite skill accumulation and economies of scale. After exploiting its comparative advantage to develop labor-intensive downstream industries, Korea sought to indigenize intermediate inputs imported from foreign upstream industries through technology acquisition, human resource development, and construction of optimal-scale plants aimed for the global market. For instance, in the chemical-textile value chain, Korea systematically built the links backward from export of textiles to production of synthetic fibers, to development of basic petrochemicals.

Moreover, instead of settling for a dual economy structure consisting of export enclaves and protected domestic markets, Korea consistently tried to increase the links between high-productivity sectors and the rest

of the economy to maximize positive spillovers. Tariff exemption on imported intermediate inputs was operational for all of Korea through the duty drawback system. Even when Korea established export processing zones to attract foreign direct investment, resident companies were encouraged to outsource processing and establish links with local companies. Thanks to these efforts, the local content of products processed in the Masan Export Processing Zone, for example, increased from 28 percent in 1971 to 52 percent in 1979 (Esquivel, Jenkins, and Larrain 1998).

Heavy and Chemical Industry Drive

For Korea a new urgency for industrial upgrading was added in the early 1970s when the United States announced that it would reduce its forward-deployed troops in Asia in the wake of the Vietnam War. The Korean government launched an ambitious campaign to build up its military capability.[26] The policy makers felt that Korea must develop heavy and chemical industries if it was to have the ability to manufacture its own weapons (O 2009; C. Kim 1990).

The heavy and chemical industry (HCI) drive was formally launched in January 1973 with the objective of firmly establishing "a self-reliant economy" and achieving US$10 billion in exports and per capita income of US$1,000 by 1981. A master plan for the HCI drive was drafted with annual and sectoral targets (table 5.3). It envisaged that heavy and chemical industries would account for more than 50 percent of manufacturing value added and contribute US$5.63 billion to exports, while light manufacturing and primary industries would add US$3.67 billion and US$0.70 billion, respectively, in 1981.

Among heavy and chemical industries, six were selected as leading industries: iron and steel, nonferrous metals, shipbuilding, machinery, electronics, and chemicals. Machinery in particular was regarded as a

Table 5.3. Targets for the HCI Drive

Target	1972	1976	1981
GNP per capita ($)	302	488	983
HCI share in manufacturing value added (%)	35.2	41.8	51.0
HCI share in manufacturing exports (%)	27.0	44.0	60.5

Source: HCI Promotion Planning Board, cited in K. Kim (1988).

critical industry not only for its high value added and extensive links with other industries but also for its contribution to defense industries. For a reference, Korean officials noted that when Japan reached US$10 billion in exports in 1967, the machinery industry accounted for 43 percent of industrial production (K. Kim 1988).

The amount of capital required to implement the HCI drive from 1973 to the target year of 1981 was estimated to be around US$9.6 billion (table 5.4). In December 1973 the government established the National Investment Fund (NIF) to finance long-term investment in heavy and chemical industries. In 1974 the NIF interest rate was set at 9.0 percent, whereas the prevailing three-year interest rate on bank loans was 15.5 percent. In real terms the NIF provided loans at a significantly negative rate. The banks also supported the HCI drive by providing policy-oriented loans on favorable terms. This was a dramatic departure from the second half of the 1960s. The interest rate could no longer operate as an effective price signal in the resource allocation process (Lim 2000).

Instead of relying on the market mechanism, Korea sought to address coordination and innovation externalities through integrated, forward-looking plans, even as it tried to aim for international competitiveness from the outset under the slogan of "the exportization of all industries." To promote heavy and chemical industries, the government essentially

Table 5.4. Investment Requirement Estimates for the HCI Drive
(US$, millions)

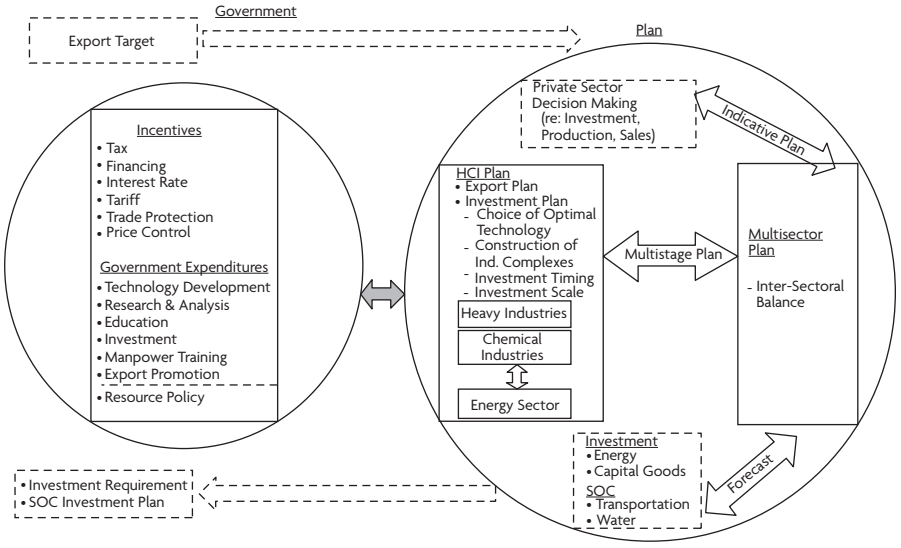
	Foreign Capital	Domestic Capital	Total	Percent Share
Iron and steel	1,502	674	2,176	22.7
Nonferrous metals	222	123	345	3.6
Machinery	1,049	1,137	2,186	22.8
Shipbuilding	416	352	768	8.0
Electronics	593	599	1,192	12.4
Chemicals	1,523	662	2,158	22.8
Subtotal	5,305	3,547	8,852	92.3
(Percent share)	(59.9)	(40.1)	(100.0)	
Others	468	273	741	7.7
Total	5,773	3,820	9,593	100.0
(Percent share)	(60.2)	(39.8)	(100.0)	

Source: HCI Promotion Planning Board, cited in K. Kim (1988).

had to secure scale economies, make massive complementary investments, and develop technical manpower with requisite skills. Figure 5.5 shows an integrated conceptual diagram for the HCI drive.

On scale economies Korea had to make a strategic choice. It could play safe and develop heavy and chemical industries for the small domestic market and risk inefficiency resulting from suboptimal scales and entrenched protectionism. Alternatively, it could promote these industries for the global market and risk capacity underutilization and financial distress. Korea chose the latter option because, despite considerable risks, it promised a dynamically efficient growth trajectory if Korea managed to develop technological prowess before the financial burden became overwhelming. To minimize time and exploit scale economies in establishing capital-intensive industries, the government decided to rely on a select group of state-owned enterprises and chaebol with a successful track record such as POSCO and Hyundai. The government provided them with extremely generous financial support, restricted entry into targeted industries, and used direct monitoring rather than competition to ensure good performance. It felt that scale economies called for

Figure 5.5. Conceptual Diagram for the HCI Drive



Source: Y. Kim 2003.
Note: SOC = social overhead capital.

regulated monopoly or oligopoly in these industries until demand became large enough to support effective competition (O 2009).

To provide infrastructure such as water, electricity, and transportation and to secure backward and forward links, the government enacted the Industrial Complex Development Promotion Law in December 1973 and set up a machinery complex in Changwon, a petrochemical complex in Yeocheon, and an electronics complex in Gumi. Bed towns providing housing facilities for workers were also constructed. National universities located near these industrial complexes were called upon to specialize in related engineering fields. Before the term was in wide use, "a cluster approach" was evident in the HCI drive.

Last but not least, Korea greatly expanded technical and vocational training, strengthened science and engineering education, and set up government labs to conduct R&D. To support the HCI drive, the government drafted a manpower development plan. Demand for technical manpower was projected to increase from 410,000 in 1969, to 1,090,000 in 1975, and to 1,960,000 in 1981. In particular, demand for technicians, who graduated from technical high school and obtained at least three years of job experience, was projected to increase from 340,000 in 1969, to 980,000 in 1975, and to 1,700,000 in 1981. Engineers, who graduated from engineering college, made up the remainder of the technical manpower demand. Table 5.5 shows the projected demand and supply of technicians from 1977 to 1981.

To supply high-quality technicians, the government established a number of technical high schools and provided incentives such as employment guarantees. The curriculum emphasized practical training, and students were supposed to acquire technical certificates before graduation. The National Technical Certification Law of December 1973 introduced a system based on the German model.

As table 5.6 shows, there were four types of technical high schools: mechanical, model, specialized, and general. To maximize their impact using limited resources, Korea established mechanical technical high schools as "centers of excellence" in each province. The most prominent among them was Kum-Oh Technical High School, arguably the best of its kind in Asia in the 1970s. Using Japanese ODA grants, the school secured practical training machinery and equipment for a total of 1.2 billion yen from December 1971 to September 1974. It also sent Korean teachers to

Table 5.5. Projected Demand and Supply of Technicians
(thousands)

Category		1977–81	1977	1978	1979	1980	1981
Demand			1,179	1,280	1,412	1,548	1,700
Supply needed	Total	843	158	147	161	179	198
	High-quality technicians	280	49	48	54	61	68
	Technicians	280	49	48	54	61	68
	Basic technicians	283	60	51	53	67	62
Supply method	High-quality technicians						
	Technical high schools	259	46	52	52	53	53
	Vocational training	77	14	15	15	16	17
	Subtotal	336	63	67	67	69	70
	Technicians						
	Vocational training	365	59	54	72	79	81
	Basic technicians						
	On-the-job training	283					

Source: HCI Promotion Planning Board, re-cited from K. Kim (1988).

Table 5.6. Technical High School Management System

Type	Management Objectives	Number of Schools	Number of Students
Mechanical	To train high-quality skilled workers to improve precision in the machinery and defense industries	19	13,920
Model	To train technicians for overseas construction work To serve as a model for general technical high school education	11	9,360
Specialized	To train high-quality technicians who could adapt to specialized industries (such as electronics, chemical, construction, iron and steel, railway)	10	5,750
General	To train technicians from various fields that could adapt to general industries	55	56,300
Total		95	65,290

Source: HCI Promotion Planning Board, cited in K. Kim (1988).
Note: As of 1979, there were 4 national, 50 public, and 41 private technical high schools.

Japan for training and invited eight Japanese teachers to cover such subjects as casting, welding, machining, forging, and heat treatment for the first three years. Offering full scholarships, the school recruited top middle school students nationwide based on their academic records and recommendations from principals as well as test scores and interviews.

Korea also set up model technical high schools to train technicians for overseas construction work in the Middle East. In response to the oil price shock at the end of 1973, Korea, instead of subsidizing consumption, raised energy prices and instituted various energy conservation measures and made a decisive shift away from oil to coal and nuclear power. At the same time, Korea went ahead with the massive planned investments in heavy and chemical industries and seized upon the new construction opportunities in the Middle East to offset the increased oil import bill (Hasan 2008). Model technical high schools guaranteed their students well-paid jobs in the Middle East and exemption from compulsory military service. Specialized and general technical high schools served as additional sources of technicians.

Although some policy makers initially questioned if the Korean people had the right national character to succeed in sophisticated industries that required precision and attention to detail, young students at Kum-Oh and other technical high schools soon showed that they could develop the requisite skills. They led Korea to place first in the International Vocational Olympics from 1977 to 1991. Park Chung Hee frequently visited technical high schools to provide personal encouragement to young students, calling them, quite appropriately, "the flag-bearers for the nation's modernization."

As for the supply of engineers, Korea sought to improve university education through specialization. Universities were called upon to select one specialized engineering field, related to a nearby industrial complex if possible, and invest intensively in that field to produce engineers with both theoretical and practical knowledge. For instance, Busan University, near the Changwon Machinery Complex, specialized in mechanical engineering; Gyeongbuk University, near the Gumi Electronics Complex, invested heavily in electrical engineering; and Jeonnam University, near the Yeosu Chemical Complex, promoted chemical engineering.

In the area of R&D, the government had already established the Korea Institute of Science and Technology in 1966 and the Korea Advanced Institute for Science and Technology in 1971. In addition, it passed the Technology Development Promotion Law in 1972, providing tax and other incentives to encourage private sector R&D. It also established five industry-specific government research institutes in shipbuilding, electronics, machinery, metal, and chemical industries according to the

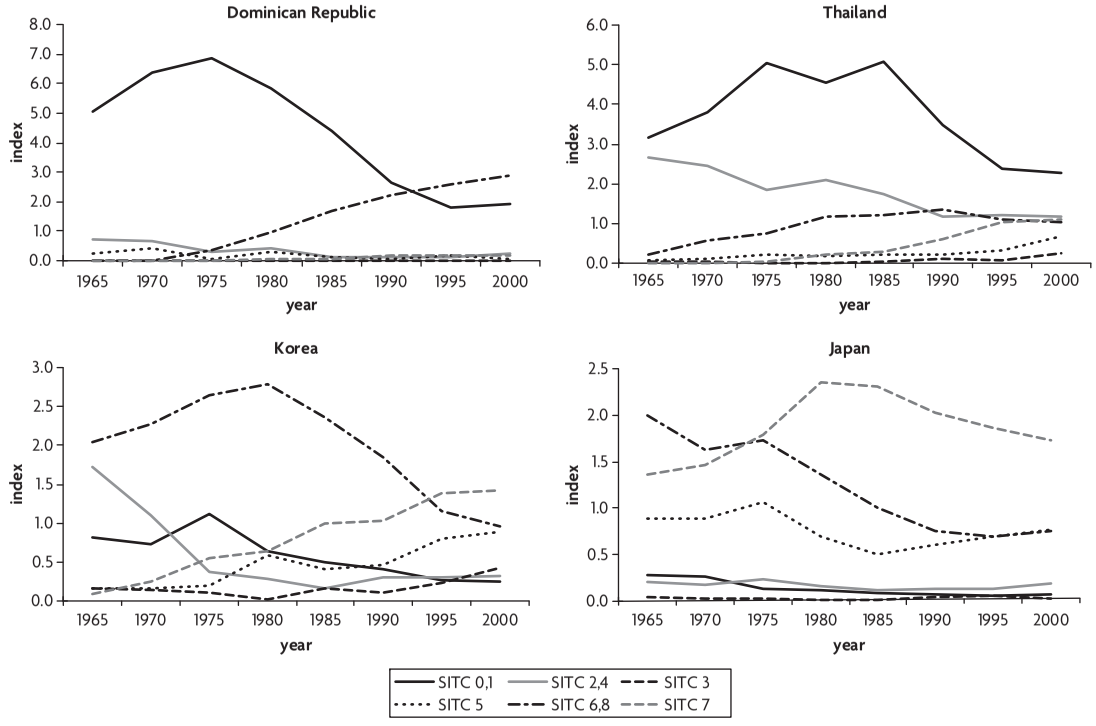
Specialized Research Institute Promotion Law of December 1973. Subsequently, science parks were constructed, and by the end of 1979, four specialized research institutes were located in Seoul, one in Gumi, two in Changwon, and nine in Daeduk. As for the defense industry, the government aggressively expanded the Agency for Defense Development by recruiting all available Korean manpower at home and abroad. Because the United States was reluctant to share defense technologies, Korea had to resort to extensive reverse engineering.[27] Through these efforts, the government sought to address innovation externalities critical to sustained growth.

As is frequently observed, industrial targeting and upgrading entails a great deal of risk taking; however, lack of conscious efforts to target and upgrade industries has its share of risks as well. For example, as figure 5.6 shows, the Dominican Republic had a large and increasing comparative advantage in sugar in the early 1970s, when its per capita GDP was on par with Korea's. Its heavy dependence on sugar, however, left it vulnerable to commodity price swings and lack of improvement in productivity. Although its garment exports began to take off in the 1980s thanks to free trade zones, the local content of these exports has been limited. Thailand had a strong comparative advantage in rice and other raw materials in the early 1970s. It subsequently developed the garment and electronics industries, taking part in the regional division of labor in Asia. However, the pace of its industrial upgrading and human resource development has been rather slow.

Korea had a strong and increasing comparative advantage in light industries when it made its strategic decision to promote heavy and chemical industries in 1973. After benchmarking advanced industrial nations with natural endowments similar to Korea's, such as Japan, Korea recognized that it had a potential comparative advantage in machinery and equipment industries and began to remove obstacles to achieving this objective, such as lack of technicians and engineers with requisite skills in sophisticated industries.

The Korean government had to call off the HCI drive when serious macroeconomic imbalances and political problems forced it to adopt a comprehensive stabilization program in April 1979 (Stern et al. 1995). Although this was two years before the target year of 1981, the government by then had invested US$8.3 billion, or 86 percent of the planned

Figure 5.6. International Comparison of Revealed Comparative Advantage



Source: J. Kim 2009.

Note: Revealed comparative advantage is computed from the data obtained from world trade flow database constructed by Feenstra et al. (2005). A figure greater than 1 implies that the industry's share in the country's exports is higher than the world average and that the country has a comparative advantage in that industry. SITC 0, 1 = food and beverages; SITC 2, 4 = crude materials; SITC 3 = mineral fuels; SITC 5 = chemicals; SITC 6, 8 = Manufactures; SITC 7 = machinery and equipment.

amount, in heavy and chemical industries. Foreign capital financed 39 percent of this investment. Over the 1973–79 period, heavy and chemical industries accounted for 36.5 percent of facility investment in the manufacturing sector. Steel and petrochemical industries accounted for two-thirds of the HCI investment (K. Kim 1988).

Although capacity underutilization was a major problem at the end of the 1970s, the HCI drive built the foundation of many of Korea's leading industries such as steel, shipbuilding, machinery, electronics, and petrochemicals. It greatly strengthened backward and forward linkages among these industries, as well as related industries such as automobiles, to increase the local content of exports. It also enabled Korea to develop its own defense industry. Last but not least, the HCI drive set the stage for Korea's transition to an innovation-driven economy by expanding technical and engineering education and establishing a nucleus of R&D labs.

Technology Absorption, Assimilation, and Innovation

When Korea exploited its latent comparative advantage in labor-intensive industries in the early 1960s, it could readily import mature technologies embodied in machinery and equipment. As Korea subsequently sought to fill the missing links in the domestic value chain and move up the quality ladder, however, it had to adopt proactive technology acquisition strategies to indigenize intermediate inputs it imported. The relatively minor role of foreign direct investment in Korea's industrialization meant that Korea had to acquire technologies through other means.[28] Combining foreign and local technological elements, Korea progressively developed local capabilities (Dahlman, Ross-Larson, and Westphal 1985).

Although technology acquisition strategies varied across industries, successful Korean companies systematically built their capabilities by absorbing, assimilating, and improving upon the acquired technologies.[29] For example, Korean companies in light industries such as apparel and footwear initially acquired technologies through original equipment manufacturing (OEM) arrangements, as foreign OEM buyers provided everything from raw materials to design, production know-how, and quality control. Many Korean companies then moved on to original design manufacturing by mastering process engineering and detailed product design skills. Eventually, some companies successfully made a

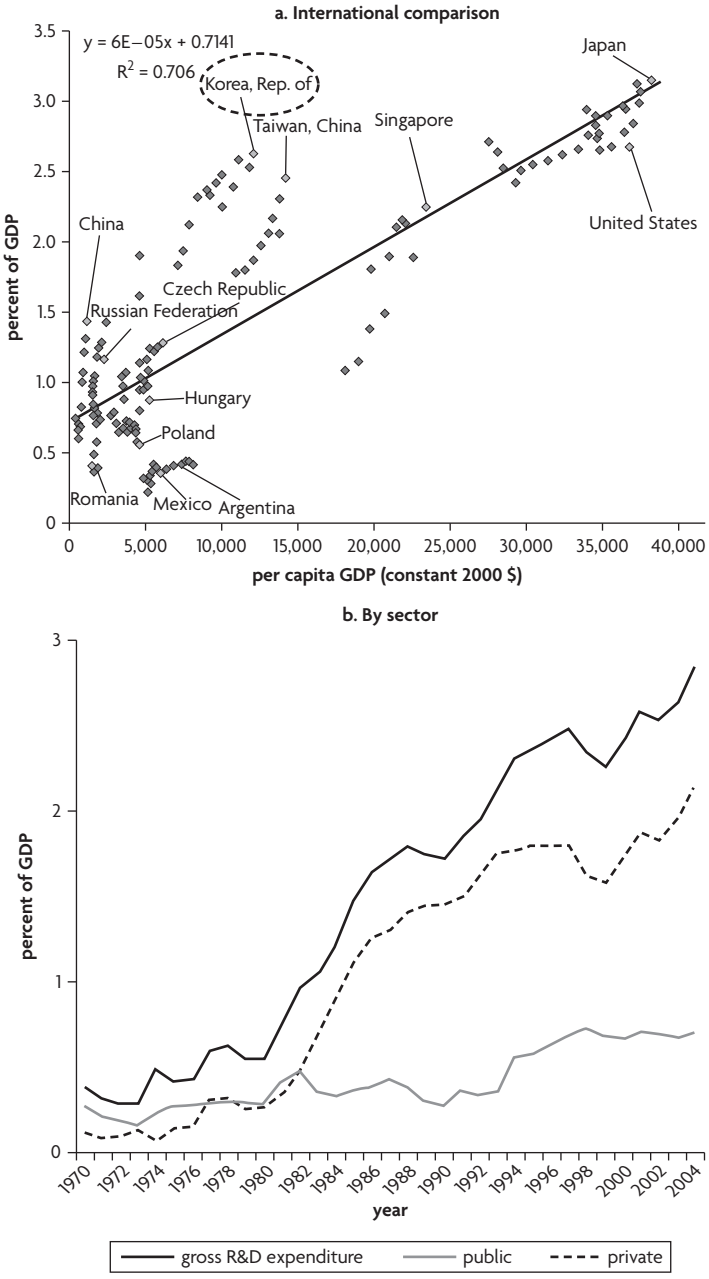
transition to original brand manufacturing by conducting their own R&D and establishing their own brands and distribution networks. In chemical industries Korean companies acquired technologies through technical training programs linked to the imports of turn-key plants. Later, by operating these plants, Korean engineers and technicians internalized and improved upon the embodied technologies. In the machinery and electronics industries, Korean companies tended to resort to formal technology licensing and reverse engineering (S. Chung (2009). In such industries as power generation equipment, standardization was as important as indigenization efforts in improving Korea's technological capability.

In the 1960s and 1970s the public sector played a dominant role in R&D, mainly through newly established government labs. However, as Korean firms came to realize that they should go beyond imitation and assimilation and do their own innovation to succeed in global markets, they drastically increased their R&D spending, in part encouraged by government support. For instance, starting in the early 1980s, major shipbuilding companies such as Hyundai, Samsung, and Daewoo established their in-house R&D labs with more than 300 researchers each.

As figure 5.7 shows, Korea's gross R&D expenditure increased from less than 0.5 percent of GDP in the early 1970s to approximately 3 percent of GDP in the mid-2000s. Over the same period the private sector share of the R&D spending increased from 20 percent to 75 percent. The number of researchers also increased from 6,000 to 220,000. As of 2010 there are more than 20,000 industrial labs in Korea. In international comparison Korea appears to spend much more on R&D than is predicted by its per capita income, but the Korean government and companies believe that such high R&D spending flows are necessary to make up for the low initial stock and to secure sustained economic growth.

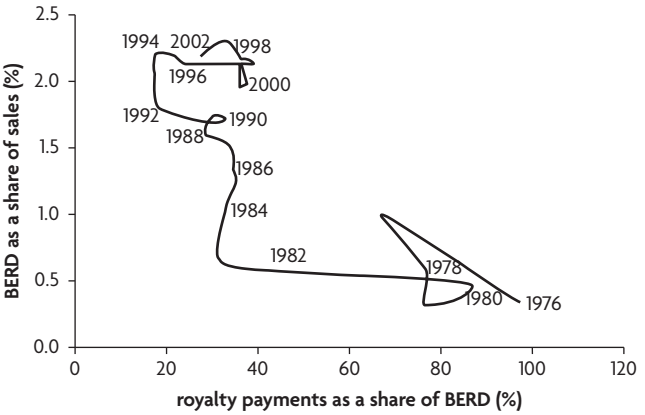
Furthermore, as figure 5.8 shows, not only did Korean companies increase business expenditure on R&D (BERD) as a share of sales but they also increasingly conducted their own R&D instead of just relying on technology licensing. As a result royalty payments as a share of BERD tended to decline over time. Thanks to increased R&D efforts Korea trailed only the United States, Japan, and Germany in the production of industrial property as measured by the number of U.S., European, and Japanese patents registered in 2006 (S. Chung 2009).

Figure 5.7. Korea's Gross R&D Expenditure



Source: World Bank 2007; Ministry of Science and Technology, Bank of Korea.

Figure 5.8. Korea's Business R&D Expenditure: From Assimilation to Innovation



Source: J. Suh 2007, 39.
Note: BERD = Business Expenditure on Research and Development.

Korea's outward-oriented industrial upgrading efforts led to dramatic changes in its comparative advantage. As table 5.7 shows, Korea's top exports changed from primary products in 1960 to labor-intensive manufactures in 1970, and increasingly shifted to capital- and knowledge-intensive products in subsequent decades.

Korea's Transition to a Democratic Market Economy

Korea successfully exploited its latent comparative advantage in labor-intensive industries in the early 1960s and systematically developed its potential comparative advantage in machinery and equipment industries starting in the late 1960s. Korea's authoritarian developmental state formed a "big-push partnership" with business and promoted "rapid, shared growth" through export-oriented industrialization and human resource development. As the capacity of markets, the state, and nonstate actors to meet innovation and coordination challenges changed, however, their respective roles began to shift as well. Some of this transition was fairly straightforward, as in the case of R&D. Other changes in the respective roles of markets, the state, and nonstate actors proved much more problematic. As the power balance in Korea's business-government relations shifted in favor of business groups, for instance, it became increasingly difficult to contain rent-seeking and moral hazard.

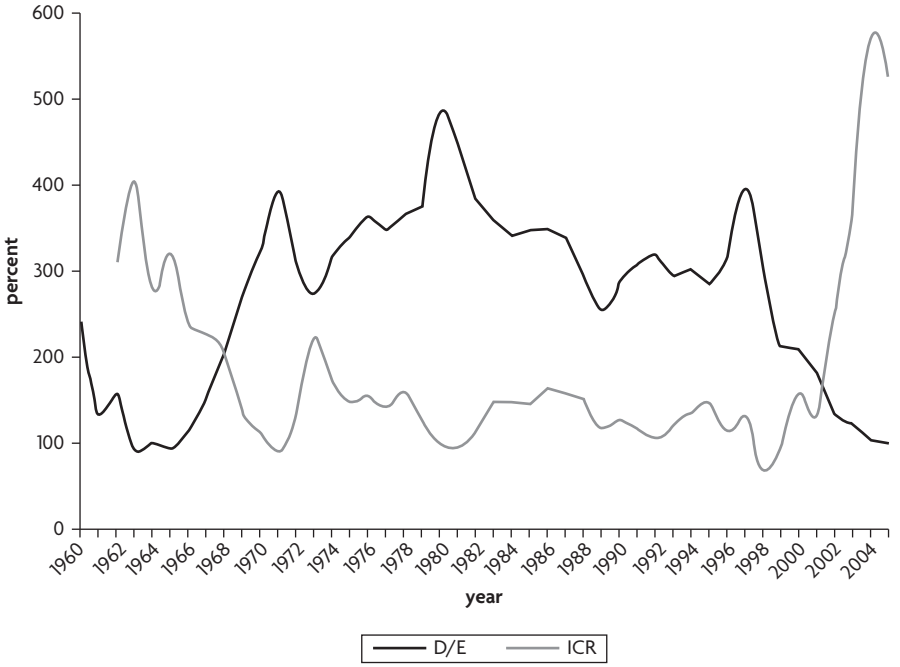
Table 5.7. Korea's Top Ten Exports

	1960	1970	1980	1990	2000
1	Iron ore	Textiles	Textiles	Electronics	Semiconductors
2	Tungsten ore	Plywood	Electronics	Textiles	Computers
3	Raw silk	Wigs	Iron and steel products	Footwear	Automobiles
4	Anthracite	Iron ore	Footwear	Iron and steel products	Petrochemical products
5	Cuttlefish	Electronics	Ships	Ships	Ships
6	Live fish	Fruits and vegetables	Synthetic fibers	Automobiles	Wireless telecommunication equipment
7	Natural graphite	Footwear	Metal products	Chemicals	Iron and steel products
8	Plywood	Tobacco	Plywood	General machines	Textile products
9	Rice	Iron and steel products	Fish	Plastic products	Textile fabrics
10	Bristles	Metal products	Electrical goods	Containers	Electronics home appliances

Source: Korea International Trade Association.

Figure 5.9 shows that Korea's big-push partnership faced three major crises in 1972, 1980, and 1997. The crisis in the early 1970s primarily had to do with Korean firms' heavy dependence on short-term "curb" loans from the informal domestic financial sector. Speaking for "hard-working entrepreneurs" suffering from crushing debt, business leaders at the time went so far as to urge the government to reduce taxes, expand money supply, and have state-owned banks take over the "usurious" curb loans. In the end the government issued an emergency decree in August 1972 that bailed out the debt-plagued corporate sector by placing a three-year moratorium on the repayment of curb loans and converting short-term high-interest loans into long-term loans on concessional terms. The government in effect sacrificed the property rights of curb lenders to relieve the debt burden of entrepreneurs it had come to trust as agents to carry out its ambitious economic development plans (Lim 2000).

Figure 5.9. Debt-Equity Ratio and Interest Coverage Ratio in Korea's Manufacturing Sector



Source: Bank of Korea.
Note: Interest coverage ratio is calculated by dividing operating income by interest expenses.

The financial crisis in 1980 was largely a product of the ambitious HCI drive of the 1970s. As such, the crisis had primarily to do with policy-oriented loans provided by state-owned banks, and the government could afford to take a gradual approach. In fact, after calling off the HCI drive in 1979, the government took a number of industrial rationalization measures—spiced with "special loans" from the Bank of Korea to commercial banks—and waited for the economy to grow out of the problem.

Starting in the 1980s liberalization and democratization weakened government control, while expectations for government protection against large bankruptcies remained strong. Even as various entry restrictions and investment controls were lifted, institutional reforms and credible market signals (such as large-scale corporate failures) designed to replace weakening government control with market-based discipline were not introduced. The chaebol expanded their influence in the nonbank financial sector and took advantage of the government's implicit guarantees to make aggressive investments, systematically discounting downside risks. The liberalization of capital markets in the 1990s exacerbated the problem by making Korea vulnerable to sudden capital flow reversals. Moreover, although Korea's democratization in 1987 ushered in a new era of free and competitive elections, it took several years before Korea's civil society became strong enough to effect changes in campaign financing rules and introduce other anticorruption measures designed to enhance transparency and accountability.

Much like business-government relations, labor relations faced a problem of transition as Korea attempted to move from an authoritarian developmental state to a democratic market economy. Strong job security in exchange for weak labor rights had been an integral part of the imposed social bargain under the authoritarian regime in Korea. This arrangement came under attack from both labor and management after Korea was democratized. Workers demanded wage increases as well as full-fledged rights to organize and take collective action. Business executives complained that lifetime employment practices impeded flexible adjustment to changes in the increasingly competitive global market. A grand bargain between labor and management would have involved enhanced labor rights and social security in exchange for labor market flexibility. However, repeated attempts to reach such a bargain resulted in protracted gridlocks.

It took the economic crisis of 1997 for Korea to introduce credible, market-based discipline and reach a grand social bargain. In the aftermath of the crisis Korea cleaned up massive nonperforming loans and adopted institutional reforms to reduce moral hazard, improve corporate governance, promote competition, and strengthen the social safety net. As a result of the crisis, during which 16 large business groups failed, firms reassessed default risks in making their investment decisions and greatly improved their interest coverage ratio. Korea effectively used the crisis as an opportunity to redefine the respective roles of markets, the state, and nonstate actors and to make the transition to a democratic market economy (Lim and Hahm 2006).

Summary and Conclusion

Korea's development took place through joint discovery and upgrading of comparative advantage. To promote development the government and the private sector made joint efforts to address innovation and coordination externalities. They developed "a big-push partnership" in which the government shared the investment risks of the private sector and provided support largely based on performance in competitive global markets. The reinforcement of successful experiments through the feedback mechanism of performance-based rewards led to dramatic changes over time. The government provided implicit guarantees against large-scale bankruptcies and maintained various entry restrictions and investment controls to contain moral hazard, to a large extent.

The government formulated multiyear development plans but delegated much of their implementation to business groups, which in turn tried to coordinate productive activities at the group level in addition to engaging in market transactions. To monitor progress, identify emerging problems, and devise solutions to these problems, the government held regular consultations with the private sector such as monthly export promotion meetings. Together with monthly meetings reporting on economic trends prepared by the Economic Planning Board, these consultations helped to ensure that indicative plans would be taken seriously and modified decisively as the objective circumstances changed.

Korea also used international trade as an essential component of its development policy. Trade helped Korea to discover its comparative

advantage and alleviate coordination failures, overcome the limits of its small domestic market and exploit scale economies, learn from good practices around the world and upgrade its economy, and run a market test for its government policies and corporate strategies and devise performance-based reward schemes. In fact, for Korea, export promotion—for which the nation had to change its mindset and measure itself against global benchmarks—served as the engine of growth and the organizing principle under which industrial upgrading, infrastructure development, and human resource development could be pursued. While relying on global markets, Korea made conscious and concerted efforts to move into higher value added areas along the value chain by making complementary investments in human capital and infrastructure. In fact, unlike some countries caught in "a middle-income trap," Korea managed to achieve *export-led growth*, not just export growth, by systematically increasing the local content of its exports.

A dichotomous characterization of industrial policy as being either comparative-advantage-conforming or comparative-advantage-defying does not do full justice to Korea's efforts to upgrade its comparative advantage.[30] For instance, the promotion of heavy and chemical industries in the early 1970s was not comparative-advantage-conforming, because Korea at the time had a strong *and* increasing comparative advantage in light industries. Nor was it simply comparative-advantage-defying, because the architects of the HCI drive had benchmarked the structural transformation of advanced industrial nations, namely, Japan, with similar natural endowments to Korea's and could reasonably imagine what should be done to promote industrial upgrading, infrastructure development, and human resource development in an integrated manner, with a view toward securing international competitiveness (hence, "exportization of all industries" and "scientization of all people"). In short, Korea took premeditated but considerable strategic risks in promoting heavy and chemical industries. Korea adopted an outward-oriented, bottom-up, and integrated engineering approach in its industrial policy and chose an option that promised a dynamically efficient growth trajectory if it managed to develop technological prowess before the financial burden associated with scale economies and complementary investments became overwhelming. In contrast, many developing countries failed in their industrial policy

because they rushed to promote upstream industries for the domestic market without first gaining requisite scale economies and skill accumulation.[31]

Although state intervention in the economy was extensive in Korea in the 1960s and 1970s, Korea managed to contain corruption and rent-seeking. A student revolution in 1960 that overthrew a corrupt government and a military coup in 1961 that placed economic modernization at the top of its agenda had changed Korea's political economy. Meritocratic institution-building and monitoring, as well as improved welfare for government officials, helped to control the negative side effects of state intervention. Most important, making government support contingent on performance in competitive global markets helped to reduce the potential for corruption.

As the capacity of markets, the state, and nonstate actors to meet innovation and coordination challenges improved, their respective roles began to shift as well. While the division of labor between the government and the private sector has changed, joint discovery and upgrading of comparative advantage has continued to operate as a fundamental development principle for Korea. The development of markets and institution of postcrisis reforms, including the adoption of a more flexible exchange rate policy, has made it easier for Korean firms to rely on price signals to discover profitable business opportunities, even as they continue to engage in consultations with the government to identify promising technologies and deal with bottlenecks. The government has made massive investment in information technology infrastructure and provided generous R&D support. Firms, for their part, have changed their investment behavior in the wake of the crisis and focus more closely on building and upgrading their core competence. Democracy now provides the institutional platform for Korea to foster autonomy, diversity, and experiment essential to sustained productivity-led growth.

Notes

1. Cited from the Preface by Juan Temistocles Montas, Minister of Economy, Planning, and Development of the Dominican Republic, in Galvan (2008).
2. The Commission on Growth and Development (2008) has identified 13 successful cases of sustained high growth, ranging from Botswana to Thailand, and noted "five striking points of resemblance"—openness: import knowledge and

exploit global demand; macroeconomic stability: modest inflation and sustainable public finances; future orientation: high investment and saving; market allocation: prices guide resources and resources follow prices; and leadership and governance: credible commitment to growth and inclusion and capable administration. Conspicuously missing from this list is the use of nonmarket measures to coordinate productive activities, facilitate industrial upgrading and innovation, and cope with external shocks.

3. Lindauer and Pritchett (2002) summarize "long and perhaps not entirely fruitful debates" about Korea: "Was Korea outward oriented or protectionist? Export promotion policy suggested outward oriented, while import protection suggested protectionist. Was Korea government led or market friendly? Examination of the mechanics of government direction of the economy, government allocation of credit, and promotion of specific industries suggested government led; the use of the private sector (versus parastatal firms or government agencies) as the instrument of investment and the role of business councils suggested market friendly. Was Korea's growth Big Push or private sector and productivity led? This issue sparked generations of debate about Korea's total factor productivity (TFP)—whether it was low, about that of the OECD countries, or fast by cross-country standards. . . . *These debates were often less about what Korea actually did than about what label to apply to Korea and then sell to other nations eager to emulate Korea's success.*" *(emphasis added)*
4. Entrepreneurs and workers played an important role in Korea's development, but as far as designing the Korean model of development is concerned, three policymakers stand out: Park Chung Hee, who served as president from 1961 to 1979; Kim Chung-yum, who served as minister of commerce and industry and chief of staff to President Park; and O Won-chul, who served as senior economic secretary to President Park for the promotion of heavy and chemical industries in the 1970s. Each of them has a memoir available in English: Park (1963), based on his book of the same title published in Korean in 1961; Kim (1994), an abridged version of his memoir published in Korean in 1990, which was subsequently revised in 2006; and O (2009), based on his seven-volume memoir in Korean.
5. The historical account of Korea's development in the 1950s and 1960s draws extensively from Lim (2000).
6. In this conceptual framework, "new knowledge" is knowledge that is new in a given (local) context. Something as old and simple as a mosquito net may be regarded as a major new innovation when it is placed in the context of a fight against malaria, for instance (World Bank 2010).
7. Lucas (2009) has characterized the relationship between economic growth and knowledge as follows: "What is it about modern capitalist economies that allows them, in contrast to all earlier societies, to generate sustained growth in productivity and living standards?. . . What is central, I believe, is the fact that the industrial revolution involved the emergence (or rapid expansion) of a *class*

of educated people, thousands—now many millions—of people who spend entire careers exchanging ideas, solving work-related problems, generating new knowledge."

8. Adam Smith (1776) opens his inquiry into the nature and causes of the wealth of nations with an observation on the productivity-improving effects of the division of labor, which he notes is limited by the extent of the market. Alfred Chandler (1977) emphasizes that "modern business enterprise took the place of market mechanisms in coordinating the activities of the economy and allocating its resources," and observes that "the visible hand of management replaced what Adam Smith referred to as the invisible hand of market forces" in many sectors of the economy.
9. In a letter to Isaac McPherson, a Baltimore inventor, on August 13, 1813, Thomas Jefferson wrote: "If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it. Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me."
10. For a comprehensive account of the role of knowledge-promoting institutions in the development of the West, see Rosenberg and Birdzell (1986).
11. For a seminal discussion on the problem of coordination failure in development, see Rosentein-Rodan (1943) and Murphy, Shleifer, and Vishny (1989).
12. In fact, in an increasingly integrated global economy, a nation's economic performance largely depends on its ability to enhance its relatively immobile factors of production to attract mobile factors of production.
13. The contrast between Friedrich von Hayek and Ronald Coase is telling in this regard. Criticizing John Maynard Keynes as well as Karl Marx, Hayek asserted that state intervention would threaten human liberty and place society on "the road to serfdom"—even if this state intervention was supported and demanded by a free democratic political process. Hayek also argued that because of information and incentive problems, planning would prove inferior to market mechanisms in coordinating economic production. By contrast, Coase took a much more balanced view on the merits and demerits of markets versus hierarchies based on the concept of transaction costs (Lim 2009a).
14. The hwan was converted to the won at the rate of 10 to 1 in June 1962.
15. Seol Kyung-dong, treasurer of the Liberal Party, was a beneficiary of one of these privatization deals and took over a textile mill in Taegu. Kang Jik-sun, a businessman who picked up Samcheok Cement Co., donated a 30-percent equity share in the company to the Liberal Party (K. Kim 1990).
16. Of the 22 largest business groups in Korea in 2000, only 7 began before 1945. The most prominent among these—Hyundai, Samsung, and LG—were little

more than small, family-based enterprises until the 1940s. Eleven were founded during the American occupation (1945–48) and Syngman Rhee's presidency (1948–60). Four groups founded in the 1960s, including Lotte and Daewoo, expanded rapidly enough to be counted among the largest business groups in 2000. At the end of the 1960s only Samsung and LG had made the list of the top 10 business groups in Korea (Lim 2003).

17. In the 1950s an American economic advisory team to the United Nations Korean Reconstruction Agency prescribed a somewhat similar strategy. This group argued for a program of infrastructure investment and import substitution that would make Korea "self-sufficient" in five years, to be financed by large infusions of development assistance and greatly expanded primary exports (Haggard, Kim, and Moon 1991). With the benefit of hindsight, it is rather interesting that both the military government and the American experts called for export expansion in primary products.
18. The revised plan advocated a free market economy, scrapping "guided capitalism" as the basic principle of economic policy. It also emphasized the importance of stabilization policy, scaled down economic growth targets, and crossed out such investment projects as an integrated steel mill. Last but not least, the revised plan called for a shift in export priorities from primary products to labor-intensive manufactured goods.
19. This "market-oriented" policy measure had the effect of increasing the government influence in financial resource allocation because the banks were state owned. During the three-month period from July to September 1965, fixed-term money deposits increased by 2 billion won; whereas from October to December, deposits soared by 12.5 billion won. For maximizing the amount of financial resources under state control, an attractive real interest rate turned out to be much more effective than forced savings measures.
20. In the early 1960s, only a decade removed from the Korean War, foreign multinationals were unimpressed by Korea's growth prospects and did not consider Korea to be an attractive destination for investment, either. However, even after Korea's growth prospects improved and Japanese multinationals, in particular, expressed interest in investing in Korea after the normalization of diplomatic relations in 1965, Korea maintained a rather restrictive regime on foreign direct investment. Korea's previous experience with Japanese colonial rule, during which the Japanese owned more than 90 percent of industrial properties in Korea, played a decisive role in this policy stance.
21. Korea's efforts to earn hard currency in the early stages of its development also included the dispatch of miners and nurses to West Germany in the early 1960s to secure remittances, participation in the Vietnam War to obtain increased military assistance, and normalization of relations with Japan in 1965 to receive reparations.
22. In his memoir, O (1995) recalls that the government was clearly aware of the potential moral hazard created by this arrangement from the moment it was introduced in July 1962, likening it to "a wild horse."

23. At the Ministry of Commerce and Industry, deputy-director-level officials were tasked to monitor export performance by major industry. The integration of trade and industry functions in the same ministry enhanced policy implementation.
24. In 1962 labor-intensive manufactures accounted for less than 15 percent of Korea's total exports of US$54.8 million. In 1963 exports increased by US$32 million, or 58.4 percent, to reach US$86.8 million, and labor-intensive manufactures such as textiles and footwear accounted for more than 80 percent of this increase.
25. In fact, the policy priorities for the Second Five-Year Plan were as follows: to achieve self-sufficiency of food, forestation, and maritime development; to lay the foundation of industrialization by promoting chemical, steel, and machinery industries, and to double industrial production; to achieve an export target of US$700 million and improve the balance of payments through import substitution; to increase employment and to suppress population growth through birth control; to achieve considerable increases in people's income, in particular farmers' income through farming diversification; and to enhance technical capacity and productivity by promoting science, technology, and management and by cultivating human resources.
26. Korea raised its defense spending from 4 percent of GDP in the 1960s to 6 percent in the late 1970s. A new 5 percent ad valorem national defense tax helped to finance the military modernization program.
27. In the early 1970s very few Korean engineers were capable of designing weapons. To solve this shortfall, subcommittees were formed according to weapon systems, and those who had some knowledge were appointed as members. As advisory bodies to the Agency for Defense Development (ADD), they worked with the ADD researchers to reverse-engineer weapon systems. After the ADD successfully designed prototypes and came close to the production stage, the United States would start negotiating technology licensing agreements with Korea. Reverse engineering had strengthened Korea's bargaining position, and the United States apparently felt that it would be better to maintain some control by signing formal technology licensing agreements (K. Kim 1988). A similar pattern regarding technology acquisition would be observed in civilian industries as well.
28. Westphal, Rhee, and Pusell (1981) observe: "Korea's industrialization has overwhelmingly and in fundamental respects been directed and controlled by nationals. Inflows of investment resources have largely been in the form of debt. Technology has thus been acquired from primarily through means other than direct foreign investment. . . . Indeed, for most industries, Korea appears to have had little difficulty gaining access to technology and to export markets: that is world markets appear to be competitive, not restrictive, as is frequently asserted."
29. Parvez Hasan (2008), who served as lead economist for Korea in the mid-1970s at the World Bank, recalls that "Koreans did not insist on strong backward linkages right away and were content to rely heavily on imported technology

equipment." When he visited the Hyundai shipyard for the first time in 1973, the skilled labor was "essentially nailing down the steel plates and the equipment." The general manager was from Denmark, and blueprints for the oil tanker were all imported. When Hasan made his second visit a decade later and asked the Korean general manager whether they had a design department, he was told that "of course they had a design department and it employed more than hundred engineers." Over the course of the decade, Hyundai had successfully climbed up the quality ladder.

30. For a more detailed discussion on the relationship between comparative advantage and industrial policy, see Lin and Chang (2009); Lin (2010); and Lin and Monga (2010).
31. To understand the dynamic transformation of comparative advantage, it is necessary to analyze how a country's endowment structure is upgraded through economic development and proactive public-private efforts. This discussion begs the question of how to operationalize the concept of upgrading comparative advantage. Revealed comparative advantage has serious limitations since it is clearly a lagging indicator. Instead, it may be advisable to make a good use of benchmarking exercises and consider, for example, targeting "industries that have been developed for about 20 years in dynamically growing countries with similar endowment structures and a per capita income, measured in purchasing power parity, that is about 100 percent higher than their own" (Lin and Monga 2010). Along this line, a country like the Dominican Republic may take a look at Ireland and Singapore, globally connected, smart islands that have effectively played the supply chain game (Lim 2009b); whereas Kazakhstan may benchmark Australia, a large, resource-rich, sparsely populated country (J. Kim 2010); and Ghana may consider Malaysia, an ethnically diverse, medium-sized country that has successfully diversified and upgraded its economic structure (Breisinger et al. 2008).

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Comments by Danny Leipziger

The George Washington University

Korea's Success in Hindsight

In retrospect it is clear that a specific combination of political and economic elements has been the key driver behind Korea's development success. Conventional factors often cited as significant contributors to the country's growth include prodigious savings, a focus on exports, investment in human and infrastructure capital, strong macroeconomic policies, and a capable government with a long-term development vision. In addition to these traditional elements, new factors are increasingly being recognized as playing an equally important role. These include effective economic planning, strong business-government links, investment in research and development, global branding of chaebols, adaptable economic policies, and an emphasis on tertiary education. Not all of these strategies have been without controversy, however. Some of the more contentious actions have included direct lending, industrial policy, and chaebol policy. More widely accepted, and potentially replicable strategies, include strong macroeconomic management, a strong national vision, well-aligned economic policies, effective policy implementation, and monitoring for impact.

Korea's Many Accomplishments

Korea has enjoyed an unparalleled rise in income and the quality of human welfare. The country has nurtured world-class industries, which are characterized by dynamic manufacturing and technology sectors. It ascended to the Organisation for Economic Co-operation and Development in 1996 and a decade later initiated actions to join the OECD's Development Assistance Committee, thereby making a swift transition from a debtor to a creditor nation. Now, at the helm of the G-20, Korea continues to press forward as a new international leader.

Comments on the paper "Joint Discovery and Upgrading of Comparative Advantage: Lessons from Korea's Development Experience," by Wonhyuk Lim in chapter 5 of this volume.

From Developing-Country Paradigm to OECD Role Model

The first phase of Korea's ascension on the world stage began in the 1990s. During that decade, Korea pursued a traditional growth path based on an export-oriented economy with strong macroeconomic fundamentals, which was only briefly interrupted by the 1997–98 Asian financial crisis. Korea became a poster child for the open trade model and consistently ranked high in the World Bank's *Doing Business Indicators*. The country established new institutions, including a stock market, a competition agency, and a financial supervision agency. Small and medium enterprises were fostered and generated significant job creation. This, along with a focused education policy, prepared human resources to engage in higher value added economic activities.

The second phase of Korea's growth began after the 1997 Asian financial crisis and involved some fundamental restructuring of institutions and a greater role for regulation and oversight. A little over a decade after its recovery from the liquidity crisis of 1997–98, faced with the global economic crisis of 2009, the country demonstrated exemplary crisis management skills and quickly mobilized its large fiscal surplus to boost economic demand and lower interest rates to increase liquidity. The government used public sector banks to access credit and active reserve management, which included Central Bank swap arrangements, to add to its strong reserve position as well as taking other safety net measures. Looking beyond the crisis, Korea's new Green Growth agenda will provide the country with an opportunity to deal positively with global climate change through new technologies, exports, and jobs. This concrete initiative is coupled with long-term goals, such as doubling per capita income to US$40,000.

What Can We Learn from Korean Policy Actions of 2009?

The world will likely see that a quick and coordinated policy response, which has long been a hallmark of Korean policy makers, will work yet another time. Bolstered by a strong initial fiscal position, Korean policy makers were able to swiftly implement a countercyclical stimulus. Excessive reserve holdings paid off, as did a diversified export strategy. This helped the Central Bank to provide a needed boost to liquidity. Throughout this time consumer confidence remained steady, despite turbulence abroad. In 2010 Korea has experienced a classic V-shaped recovery. The

government has been able to contain the damage to the financial sector and maintain stable employment levels. The Central Bank's ability to reverse quantitative easing leaves room to consider interest rate adjustment once growth is restored and credit rollovers assured.

What Can We Learn from the Green Growth Initiative?

Korea's Green Growth initiative combines short-term fiscal stimulus with a longer-term agenda that was well articulated publicly by President Lee Myung-bak. It sets out ambitious goals and concrete targets and provides a national vision for how the economy will adapt long term. Big corporations view the program as an opportunity to invest in green technologies, giving Korea a chance to establish global leadership in these areas, especially in electric car batteries, wind turbines, and solar cells. The Green Growth package is composed of internally aligned policies that are supported by both public and private investment. Implementation will be monitored for effectiveness.

Characteristics of Public Policy in the Postcrisis Environment

Going forward, public policy will need to focus on new job creation given large labor market dislocations. Policy makers must also examine fiscal incidence since income distribution has worsened in many places. Government spending will need to crowd in private investment since the tight fiscal space makes efficiency of expenditures a major priority. Bridging short- and long-term policy goals is paramount and appears to require a viable planning mechanism. It is noteworthy that the Green Growth agenda revolves around a five-year plan of actions, reminiscent of the EPB-monitored economic development programs of previous decades.

How Has Korea Managed to Move Successfully in the Public Space?

A critical component to Korea's successful use of public policy is its meritocratic bureaucracy. External learning is encouraged and the knowledge base strengthened by the return of expatriates. Even within the general population, higher education is fostered and excellence encouraged. Social consciousness of the need for good governance is more pronounced in Korea because of its proximity to one of the world's most closed societies immediately to the north. Bad policy ideas are simply abandoned, and the policies that are carried out enjoy national credibility.

What Can Korea Do Better?

There are certainly trade-offs between economic gains and welfare and happiness. While Korea was able to act quickly to stabilize its economy during the economic crisis, it has been slow to resolve lingering gender issues. Furthermore, demographics will take its toll unless retirement ages are raised to cope with a longer-living population. Service sector productivity must reach levels close to those in manufacturing. Global leadership does not end with the G-20.

What Can Others Learn from the Korean Experience?

There is much that developing countries can take away from the Korean experience. The first is that economic fundamentals matter, not just to satisfy donors but to actually position the economy to be better managed for the sake of progress. Second, income distribution and social programs are important, again not to satisfy donors but to maintain broad-based public support for reforms. Third, the private sector need not necessarily fear the role of government, especially if the actions of government and business can be aligned. Fourth, paying taxes finances social infrastructure and replaces aid, while contributing to build the social contract between citizens and governments; as such it should not be a central element of public policy. It is critical that governments solicit taxes from their citizens and that citizens demand quality government services in return. And fifth, government-led economic planning has been the template for all East Asian success stories and has the potential to provide similar results in other countries.

What Can Donors and the International Aid Agencies Learn from Korea's Story?

The primary take-away for donors and aid agencies is that substantial transfers of resources are a waste of money without building up the domestic institutions to be able to handle and disburse funds efficiently, fairly, and effectively. This goes hand-in-hand with promoting country ownership of development strategy, with benefits accruing to all sectors. Foreign funds must come in large doses and be matched by domestic savings and tax collection efforts. Paradigms do require substantial customization, however.

What Additional Actions Can Korea Take as G-20 Leader to Help Developing Countries?

Korea can significantly influence the G-20 agenda on behalf of low- and middle-income countries, as well as be an example to these countries on how to move forward on current international agenda items. Korea can combine its increase in ODA with green technology transfers to foster sustainable growth. It can mobilize developing countries to take up the Doha mantle. Last, Korea can share its economic planning experience with infrastructure spending and public-private coordination to build capacity and improve practice elsewhere. As a survivor of the last major crisis in 1997 and now as an exemplary manager of the 2008–10 crisis, Korea has earned the right to speak out forcefully in favor of global solutions based on strong domestic economic management.

Comments by Klaus Rohland

World Bank

Thank you, Professor Cho, for having me on this panel, and my appreciation and admiration to you, Dr. Lim, for such a concise and comprehensive presentation that covered the story line so comprehensibly. I really have not much to add to the observations already made by other discussants and would like to focus on five issues that, in my view, deserve highlighting. In doing so let me also recognize and thank the former deputy prime minister of Korea, Jin Nyum, whose presentation to Vietnamese policy makers in November 2004 in Hanoi on "Policy Coordination in Planning Socio-Economic Development" greatly shaped my views on Korea's post-1962 development trajectory and arising lessons for other aspiring countries on their long way from low-income status to OECD membership.

Policy Coordination Is Important

Many low-income countries struggle to find the best ways of policy coordination for socioeconomic development. There are at least two dimensions to this. First, what is the appropriate role of government and, respectively, business, in a development strategy. Second, how should policy planning and budget functions of government be organized. The Korean government in office in the early 1960s took a very pragmatic approach. The strategy was state led, but its implementation was to a large extent left to private business, mostly Korea's chaebols. This approach stands in marked contrast to the attempts in many other developing countries where a socialist government pursued state dominance of the economy. The experience of newly independent Ghana, which was at the same GDP per capita level as Korea in the early 1960s but fared significantly worse subsequently, is often cited in this regard. What makes Korea also stand out is its decision to merge development planning and resource allocation in one agency, the Economic Planning Board. And the EPB was part of the prime minister's

Comments on the paper "Joint Discovery and Upgrading of Comparative Advantage: Lessons from Korea's Development Experience," by Wonhyuk Lim in chapter 5 of this volume.

office, fully empowered to coordinate every economic policy in the country. Korea avoided getting mired in arguments about coordination between separate planning and budget agencies that have been so wasteful in many other countries' experience. Korea's "whole of government" approach was anchored in organizational arrangements in a well-considered way.

Complement Industrial Policy with Social Equity

Korea's development strategy was not only about industrialization. Its agricultural policy helped to address the needs of the rural population and manage the shift from agriculture as the predominant source of GDP (60 percent in the early 1960s) to the industrial sector. The two-tiered subsidized price system for rice is a good example of managed development that eventually saw the industrial sector emerge as the predominant source of growth and income. Also, the New Community Movement with its focus on rural life ensured that traditional rural values and communities were made part in Korea's way forward.

Be Prepared to Change Tack When the Usefulness of the Original Strategy Diminishes

In the early 1970s Korea shifted its focus on light industry to the development of heavy and chemical industries. This shift did not derive from the Korean experience but was built on the Japanese model that Korea believed was suitable for Korea as well. While a risk, it was a calculated, well-studied risk that propelled Korea forward.

Shift the Balance of Power between the State, Private Business, and Civil Society over Time

The role of the state and its planning shifted gradually from direct to indirect planning through tax incentives and preferential credits. This shift took account of the increasing complexity of the economy. Financial sector reform and deregulation took place. While economically successful, it also left a void in oversight of business, especially the chaebols. Participation and voice for the broader society was brought in following the events of 1987. Increasingly civil society's role in oversight has been strengthened and, together with antitrust policies, has provided checks and balances in Korea's new stage of development.

Development Is Not a Linear Process: Be Prepared to Adjust to Newly Emerging Realities

Many countries have moved over time from low- to middle-income country status, but only a few have gained OECD status. Korea's people and policy makers have shown remarkable flexibility and readiness to adjust to new realities and have avoided the "middle-income trap" in which so many countries in the developing world seem to get stuck. Korea's focus on the development of a broad-based social security system in the late 1980s is an example of forward-looking policies that put the growth and equity policy into a modern framework. And, looking forward, Korea's efforts and attainments in education are well known, its international educational test results are the envy of many countries. Its focus on technology and service industries will see Korea successful in the new decade when the great global adjustments take place.

Chair's Summary by Yoon Je Cho

Sogang University

Korea's economic development during the past half century has been remarkable indeed. Within the short span of 50 years, Korea has transformed from one of the world's poorest economies to one of its most advanced. Korea's is one of the most impressive postwar development stories; however, observers have different interpretations of that success story. The opinions vary, from revisionist to neoclassical economic views: the revisionist economists argue that the strong state and state interventions for resource mobilization and allocation were key factors, while the neoclassical economists point to the export orientation, stable macroeconomic environment, high savings, and open market competition as vital elements. A more recent point of view involves the political economy and institutional aspects of Korea's development process. State planning, state business coordination, long-term national vision, institutions, social equity and cohesion, and flexibility and adaptability of policy reforms, among other things, have been given more close attention.

Wonhyuk Lim presented a comprehensive study on the Korean economic development experience with some fresh interpretations. Although he agreed with many previous interpretations, including the importance of good macroeconomic policies, export-oriented growth policies, strategic industrial and technological upgrading, and high savings and investment, he shone light on and emphasized factors such as the extensive public-private consultations, initiated by the government, to share information on the economy and markets; continuous investment in infrastructure and human development; an integrated engineering approach in the big push for industrial development; the joint discovery and upgrading of comparative advantage through public-private consultation; and so on.

The discussants generally agreed with Lim's presentation and amplified his interpretation by pointing out the meritocratic Korean bureaucratic system, which has had strong capacity for policy planning, implementation

Summary on the paper "Joint Discovery and Upgrading of Comparative Advantage: Lessons from Korea's Development Experience," by Wonhyuk Lim in chapter 5 of this volume.

and monitoring, and making adaptive policy reforms. They also pointed to the importance of building institutions and promoting primary as well as tertiary education, which allowed Korea to transition from being a technology importer to being a technology innovator. The discussants provided valuable insight on the interpretation of Korea's economic development in a comparative perspective based on their experiences in the World Bank and their personal efforts to help development in many other countries across the regions.

In this session, economic growth was not the only topic of discussion; the successful transition of an economy that was heavily state-controlled to one that is open and liberalized was also an important subject. The challenges of the transition, and of becoming an open, emerging market economy in the increasingly interconnected global market, were also discussed. The changing dimensions of economic policy reform and implementation were discussed in relation to the political transition of a country from an authoritarian to a more democratic system. Korea has gone through all of that within a short time span. Its development process was marked not only by high economic growth and rapid industrial catch-up but by frustrations and crises. It not only was blessed by favorable international environments but also suffered from volatile international economic environments. This indicates that the Korean development experience would be valuable to other developing countries that are trying to spur their economic growth while at the same time facing changes in social, political, and international environments.

At the same time, we are humbled by the fact that we still do not fully understand what the key factors are for successful development; whether a country's successful development experience could be replicated in other countries facing different social, political, and international environments; and how important noneconomic factors such as security, culture, region, and political leadership are in the development process. We have so far identified many important ingredients for successful economic development. However, synthesizing these ingredients to create a guide book for successful economic development remains a task to be completed.

Nevertheless, the Korean economic development experience is worth sharing with other developing countries at this stage. Instead of learning

direct lessons from the Korean experience, we will have to seek a best possible approach to development for an individual developing country by working together with people there, based on the Korean development experiences and the unique political and economic situations faced by those individual countries. In that connection the Korean development experience needs to be further studied, and shared with the developing community. This session, I believe, was a valuable one in the course of our endeavor in that direction.