Asia's Next Giant

South Korea and Late Industrialization

Alice H. Amsden

OXFORD UNIVERSITY PRESS
New York Oxford

CHAPTER ONE

Industrializing through Learning

THE CASE OF KOREA

This is a book about Korea and how it came to be a major factor in the world economy. But it is also a book about the industrialization process that Korea followed. This process, which will hereafter be referred to as *late industrialization*, has profound implications for a range of other countries that are also struggling to compete in the world of international business. Korea's success in this struggle can thus be seen both as a fascinating story in itself and as an example from which others may learn. It is also an example of a new way of industrializing that challenges long-held assumptions of generations of economic thinkers.

LEARNING: A NEW MODE OF INDUSTRIALIZATION

The First Industrial Revolution in Britain, toward the end of the eighteenth century, and the Second Industrial Revolution in Germany and the United States, approximately 100 years later, shared the distinction of generating new products and processes. By contrast, economies that did not begin industrialization until about the twentieth century tended to generate neither, their products and processes being based on older technology. Economies commencing industrialization in the twentieth century transformed their productive structures and raised their incomes per capita on the basis of borrowed technology. They produced using processes conceived by unallied economic and political units. The means by which they managed to compete will be referred to here as *learning*.[1]

The nature and role played by technical knowledge, therefore, separates the industrial revolutions in England, Germany, and the United States, on the one hand, from the industrialization that oc-

[1] Gerschenkron (1962) explored the costs and benefits of backwardness, but he did not systematically examine catching up as a process of learning how to compete.

curred in twentieth-century agrarian societies. If industrialization first occurred in England on the basis of invention, and if it occurred in Germany and the United States on the basis of innovation, then it occurs now among "backward" countries on the basis of learning.

The paradigm of late industrialization through learning generalizes to a diverse assortment of countries with different growth records: Japan (although in many respects it is unique among late-industrializing countries), South Korea, Taiwan, Brazil, India, possibly Mexico, and Turkey. (This list might be expanded, but one cannot add to it the city-states of Singapore and Hong Kong, because neither began from the agrarian or raw material base that is typically taken to be the starting point of industrial transformation.) Growth rates differ among late-industrializing countries, but in all cases industrialization has come about as a process of learning rather than of generation of inventions or innovations. Learning, moreover, has been based on a similar set of institutions. This book explores the nature of these institutions in general and suggests why Korea has performed so successfully. The conventional explanation for why countries like Korea, Japan, and Taiwan have grown relatively fast is that they have conformed to free-market principles. In fact, the fundamentals of their industrial policies are the same as those of other late industrializers. In all cases key prices do not reflect true scarcities. Instead, it is argued in the chapters that follow, Korea has had an outstanding growth record because the institutions on which late industrialization is based have been managed differently.

Industrialization on the basis of learning rather than of invention or innovation is not unique to the twentieth century. The global process of industrialization has always tended to be combined and uneven, with leaders and laggards, forerunners and followers. If England pioneered on the basis of invention in the eighteenth century, Continental Europe and the United States pursued on the basis of learning in the nineteenth. If Germany were itself an innovator in the nineteenth century, it also studied the examples of early England and other emulators such as France and the Netherlands. The United States in the nineteenth century has been described as both borrower and initiator (Rosenberg, 1972). While many American and German firms were innovative leaders, most were followers.

Nevertheless, a process of industrialization whose central tendency among leading firms is learning rather than invention or innovation of significantly novel technology is a distinct phenomenon and deserves treatment as such. For individual firms the absence or presence of new technology generation is decisive in determining the basis on which they compete internationally. Innovators are aided in

the conquest of markets by novel products or processes. Learners do not innovate (by definition) and must compete initially on the combined basis of low wages, state subsidies (broadly construed to include a wide variety of government supports), and incremental productivity and quality improvements related to existing products. In turn, different modes of competing are associated with differences in firms' *strategic focus*.

The corporate office, inclusive of research and development functions, tends to be the strategic focus of companies that compete on the basis of innovation. This is because it is at the administrative level that new technology gets developed and marketed. Critical significance is attached to the organization and operation of research and development because here are created the profit-making opportunities that drive the entire company.

The shopfloor tends to be the strategic focus of firms that compete on the basis of borrowed technology. The shopfloor is the focus because it is here that borrowed technology is first made operational and later optimized. Because products similar to those that the company produces are internationally available, the strategic focus is necessarily found on the shopfloor, where the achievement of incremental, yet cumulative, improvements in productivity and product specification are essential to enhance price and quality competitiveness.

Beginning in the 1960s, learners have moved rapidly into the mature markets developed by innovators. The high *level* of productivity of long-established innovators has been contested by learners' lower wages, higher subsidies, as well as intense efforts to raise productivity incrementally. Total costs in many industries appear to have run neck and neck (see the discussions of cotton textiles, ships, and steel in later chapters). International competition has heated to a degree that may be unprecedented.

THE RELATIVE SPEEDS OF INDUSTRIALIZATIONS

While the most successful twentieth-century industrializers have invited inquiry about their rapid growth and structural change, the nineteenth-century European emulators have drawn attention to their slowness. In the words of David Landes,

> In this effort to study and emulate British techniques, the nations of western Europe were favored by a number of advantages. To begin with, they had behind them an experience of organized and increasingly effective political behavior. . . . Similarly, their supply of capital and standard of living were sub-

stantially higher than in the "backward" lands of today. And with this went a level of technical skill that, if not immediately adequate to the task of sustaining an industrial revolution, was right at the margin. . . . In short, if they were in their day "underdeveloped," the word must be understood quite differently from the way it is today. . . . Nevertheless, their Industrial Revolution was substantially slower than the British.

Why the delay? Surely, the hardest task would seem to have been the original creative acts that produced coke smelting, the mule, and the steam engine. In view of the enormous economic superiority of these innovations, one would expect the rest to have followed automatically. (Landes, 1969, pp. 125–6)

Why indeed the delay? And why was it that industrialization beginning in the late nineteenth century and then following World War II appears to have progressed far faster than that of the Napoleonic War period?[2] Part of the answer lies in the advancement of science, which is worth discussing here briefly. The advancement of science underlies the distinction between industrializing by invention in the First Industrial Revolution and industrializing by innovation in the Second. Scientific advancement also had an electrifying effect on the growth rates of twentieth-century latecomers.

As the terms are typically used, *invention* and *innovation* are intimately connected, because innovation presupposes invention in a logical sense. In textbook treatments of new technological developments, invention is associated with the idea and comes first, followed by innovation or the application of the idea to commercial uses. Invention and innovation are regarded here, however, not as abstract stages, one preceding the other in new technological discoveries, but rather as descriptions of particular historical periods, invention preceding innovation in an intergenerational sense. As characteristics of two distinct time periods, one key difference between the two lies in their degree of scientific content.

The scientific content of the inventions of the First Industrial Revolution moved the world far beyond the mysticism of the Middle Ages toward a transparent understanding of how mechanical devices worked, but discoveries occurred primarily by observation, trial, and error. The Second Industrial Revolution, however, represented a discrete giant step forward insofar as technological change began to occur, far more than previously, on the basis of theory and experimentation (Bernal, 1965).

[2] Maddison (1982) provided time series data on trends in output and per capita income. His research suggests that both variables grew faster in sequentially later industrializers.

The application of science to production provided the basis for the stream of German and American innovations that lowered the British flag. For three interrelated reasons, the advancement of science also made it far easier for technology to be transferred, and so science had a profound effect on the "backward" countries: (1) Although technology remained (and still remains) idiosyncratic even in basic industries, higher scientific content increased its codifiedness or explicitness, making it more of a commodity and hence more technically and commercially accessible and diffusible from country to country.[3] (2) The application of science in the fields of transportation, communications, and management improved the *means* of technology transfer. Technical assistance, not being dependent on the know-how of a particular person, can now be dispatched over longer distances to larger numbers of people more quickly and anonymously. (3) The crowding out of art by science on the shop floor has dealt a blow to the skilled craftsworker.[4] The rise in the scientific content of technology has made operations far easier to transfer to a group of latter-day learners among whom all-around mechanical skills are scarce.

The impact of the advancement of science on the "backward" regions was ambiguous, however. Despite the benefits, it created a far wider gap in relative income levels and technological capabilities than existed previously between nations, and it also strengthened the hand of the stronger nations over the weaker. In any event, taking all factors into consideration, the speed with which late learners in the twentieth century have industrialized may not be any greater than that of the European emulators in the early nineteenth century. What is decisive is how one dates the onset of industrialization and how one decides when a country can legitimately be described as industrialized.

If one dates the start of industrialization in the European emulators from, say, 1776, when the new economic order in Britain was given theoretical recognition by Adam Smith; and if one dates the closing of the gap between Europe and England from, say, 1850 to 1873—or about ninety years later—after which England began to be overtaken; then Korean industrialization, dating from the time Korea was opened by foreign imperialists, does not appear especially fast. Korea's industrialization can be said to have begun in the 1870s, when the 1,000-year-old Yi dynasty began to shatter as a conse-

[3] A view of technology as idiosyncratic is developed at length by R. R. Nelson and Winter (1982). See also a piece by R. R. Nelson (1987) specifically related to "backward" countries.

[4] That technological change deskills workers (below the management level) is argued by Braverman (1974). For a critique of his argument, see Kelley (1986).

quence of Japanese intrusion, much as the Tokugawa regime in Japan had been shaken by the appearance of Admiral Perry only two decades earlier. Then followed a delay in the onset of industrialization in Korea of about ninety years, until the 1960s, when Korea's growth rate accelerated. Moreover, the revolutionary period of Korean industrialization continues, in that rapid growth and structural change are still in full swing and Korea has not yet come anywhere close to catching up with the most advanced countries. Even in mature industries, labor hours required per unit of output in the late 1970s were far higher in Korea than in Japan, by a scalar that averaged roughly 2.8.[5] In the mid-1980s, Korea's share of industrial activity arising from its own R&D laboratories was minuscule. In any event, Korea's growth rates only surpass all records if industrialization's start is assumed to be the point of acceleration in the 1960s.

Nevertheless, why late industrialization was slow in starting in Korea can be explained by the same set of factors that explain why late-industrializing countries progressed faster than the European emulators once their industrialization got under way. The institutions of late industrialization that underscore its success, and whose absence is responsible for delay, are the following: an interventionist state, large diversified business groups, an abundant supply of competent salaried managers, and an abundant supply of low-cost, well-educated labor. These institutions are the focal point of later chapters.

KOREA AS A SPECIAL CASE OF LATE INDUSTRIALIZATION

In late-industrializing countries, *the state intervenes with subsidies deliberately to distort relative prices in order to stimulate economic activity*. This has been as true in Korea, Japan, and Taiwan as it has been in Brazil, India, and Turkey. In Korea, Japan, and Taiwan, however, the state has exercised discipline over subsidy recipients. *In exchange for subsidies, the state has imposed performance standards on private firms*. Subsidies have not been giveaways, but instead have been dispensed on the principle of reciprocity. With more disciplined firms, subsidies and protection have been lower and more effective than otherwise.

Below the level of the state, *the agent of expansion in all late-industrializing countries is the modern industrial enterprise*, a type of enterprise that Chandler (1977) described as large in scale, multidivisional in scope, and administered by hierarchies of salaried managers. Even in Taiwan, an economy with a reputation for small-scale enterprise, the large-size firm (often a government enterprise) spearheaded industrialization in the early stages of growth (as will be discussed in Chapter 7). In Korea, the modern industrial enterprise takes the form of diversified business groups, or *chaebol*, whose size and diversity are similar to those of the *zaibatsu*, Japan's prewar big business groups. Diversified business groups are common to all late-industrializing countries, but those in Korea are especially large. The *Fortune* list of 500 international private non-oil-producing firms in 1986 included ten from Korea and only seven from all other developing countries combined (*Fortune*, 1987). The size of the chaebol and their broad diversification into nonrelated products have allowed them to survive the hardships of late industrialization, to penetrate the lower end of numerous foreign markets, and to supplant the need for multinational firms to undertake major investments in targeted industries. Whereas Korea has depended heavily on foreign loans, it has entertained almost no direct foreign investment outside the labor-intensive sectors.[6]

Salaried engineers are a key figure in late industrialization because they are the gatekeepers of foreign technology transfers. The protagonist of industrialization has shifted from the entrepreneur in the late eighteenth century, to the corporate manager in the late nineteenth, to the salaried engineer in the late twentieth. Squeezed between the state on the one hand and the salaried engineer on the other, the private entrepreneur's usefulness in the multidivisional enterprises of late industrialization appears much reduced when measured by the standards of the entrepreneurial histories of advanced countries.

Salaried engineers have performed especially well in Korea because society has invested heavily in education, from the primary level on up. In terms of sheer quantity, enough engineers have been trained to ensure that sufficient numbers pursue the career intended by their education. A large number of engineers has meant competition among them for the best jobs and the fastest promotions, thereby driving up productivity.

While a strategic focus on the shopfloor may be a *tendency* in late

[5] The industries included in this calculation are cotton textiles, paper, rubber tires, caustic soda, cement, iron castings, and ball bearings. The engineering method was used to calculate productivity, which involves computing required labor hours per unit of output. The study was undertaken by Han'guk Saengsansong Cent'a (Korea Productivity Center, 1985). For a comparison of productivity levels and growth rates in Korea and Japan, calculated as output divided by employment, see C. K. Kim, Yoo, and Whang (1984).

[6] The chaebol themselves have already begun to invest overseas as a way to jump over foreign tariffs, provide parts for their exports (in, for example, the case of automobiles), tap into high technology (in, for example, the case of electronics), and obtain raw materials (see *Maeil Kyŏngje Sinmun*, 1986e, 1986h). According to data from the Ministry of Finance, investments overseas by Koreans totaled $738.5 million as of March 31, 1987, 43% of which was in North America.

yet the archetypal late industrializer in the twentieth century was at one time or another a colony of one of the Great Powers (Japan is unique as a learner among the potentates). Colonial histories differ, but the typical economic regime of a colony was quite exemplary from the viewpoint of competitive theory. Basically, colonies followed policies of free trade and exploited their comparative advantage in the agricultural commodities markets. Their growth, therefore, could not be said to have been stunted by failure to be guided by the market mechanism.[8] Indeed, it could be said to have been stunted by failure to follow interventionist policies, namely, throwing up trade barriers and providing subsidies to promote local industry.

This leads to the final explanation, one related to institutions, not least of all the state. Quite simply, industrialization was late in coming to "backward" countries because they were too weak to mobilize forces to inaugurate economic development and to fend off a wave of foreign aggression begun in the second half of the nineteenth century. Their weakness, moreover, arose from internal social conflict—ethnic, racial, regional, or class. Such conflict precluded arrogating enough power to a central authority to prevent foreign intervention, invasion, or the catastrophic loss of statehood altogether.

States in modern history have always intervened to spur economic activity. Even the First Industrial Revolution, whose guiding principle was laissez-faire, is now being reassessed by historians with this axiom in view.[9] The British government intervened to maintain law and order and to minimize the flight of technological capability to foreign lands, albeit flat-footedly (Henderson, 1954). In the second phase of intervention, that associated with the Second Industrial Revolution in Germany and the United States, state intervention intensified because the economies of Germany and the United States were required not merely to industrialize but also to catch up. We can think of infant industry protection as the primary characteristic

[8] Reynolds argued that under colonial regimes of free trade, the "backward" regions grew at a fairly rapid clip, although to be sure, there were exceptions to the rule. According to Reynolds, "Against the view that 'life began in 1950,' . . . the Third World has a rich record of prior growth, beginning for most countries in the 1850–1914 era." (Reynolds, 1985, p. 4). In anticipation of the obvious objection, that developing countries are still desperately poor, Reynolds wrote, "Certainly people in Western Europe and the United States are much better off than people in Sri Lanka [the example he used], though not as much better off as the World Bank Table suggests . . . conversion from the local currencies to U.S. dollars at official exchange rates exaggerates the actual difference in consumption levels" (p. 40).

[9] See, for example, Taylor (1972).

of this era. Analytical coherence has been provided by writers like List (1856) and Sombart (1933).[10]

To catch up in the twentieth century has required still heavier doses of government support because backwardness has been relatively greater. The instruments of intervention have been cumulative. Not only have states in late-industrializing countries intervened by protecting infant industries. They also have intervened by providing private investors with a battery of incentives that, simplified, boil down to subsidies. The tariff epitomizes the age of infant industry protection. The subsidy, which includes tariff protection and financial incentives, epitomizes the struggle to industrialize after the Second World War.

As Gerschenkron (1962) has pointed out, backward countries are fortunate to have a backlog of technologies to draw upon. Yet Gerschenkron failed to give equal weight to the proposition that the more backward the country, the harsher the justice meted out by market forces. The inherent conflicts of the market apply to all users, rich and poor alike. But the conflicts are sharpest among the least well endowed. Countries with low productivity require low interest rates to stimulate investment, and high interest rates to induce people to save. They need undervalued exchange rates to boost exports, and overvalued exchange rates to minimize the cost of foreign debt repayment and of imports—not just imports of raw materials, which rich and poor countries alike require, but also of intermediates and capital goods, which poor countries alone are unable to produce. They must protect their new industries from foreign competition, but they require free trade to meet their import needs. They crave stability to grow, to keep their capital at home, and to direct their investment toward long-term ventures. Yet the prerequisite of stability is growth.

Under such disequilibrating conditions, the state's role in late industrialization is to mediate market forces. The state in late industrialization has intervened to address the needs of both savers and investors, and of both exporters and importers, by creating multiple prices. Some interest rates are higher than others. Importers and exporters face different prices for foreign currency. Insofar as the state in late industrialization has intervened to establish multiple prices in the same market, the state cannot be said to have gotten relative prices "right," as dictated by supply and demand. In fact, the state

[10] The extent of tariff protection in the United States is the least appreciated. McCraw (1986), however, argued that protection rather than free trade tends to be the rule in American history.

in late industrialization has set relative prices deliberately "wrong" in order to create profitable investment opportunities.

Korea is no exception to this general rule. Chapter 3 examines accumulation in Korea at the industry level, a departure from typical practice because most studies of government intervention in late-industrializing countries tend to be highly aggregative. The industry focus of Chapter 3 is cotton spinning and weaving, Korea's leading sector in the 1960s. Even in a relatively labor-intensive sector like cotton textiles, the government intervened to protect local industry from Japanese competition, intervention taking the form of tariffs, quotas, export subsidies, subsidized credit, and so forth. As later chapters indicate, subsidization rose further in the heavy industries.

Korea, therefore, provides supporting evidence for the proposition that economic expansion depends on state intervention to create price distortions that direct economic activity toward greater investment. State intervention is necessary even in the most plausible cases of comparative advantage, because the chief asset of backwardness—low wages—is counterbalanced by heavy liabilities. *Where Korea differs from most other late industrializing countries is in the discipline its state exercises over private firms.*

Discipline by the state over private enterprise was part and parcel of the vision that drove the state to industrialize. Park Chung Hee, who presided over Korean industrialization from 1961 until his assassination in 1979, revealed the vision in 1963 in a book modestly entitled *The Country, the Revolution, and I.* Park's ideas were influenced by the "revolutionaries" Sun Yat Sen, Kemal Pasha, Nasser, and the Meiji rulers. From the Meiji, the only unreservedly successful of the revolutionaries, Park learned the importance of indigenizing foreign ideas, of crowning a political hierarchy with an emperor (the *I* of the Revolution), and of allowing "millionaires who promoted the reform" to enter the central stage, "thus encouraging national capitalism" (Park, 1963, p. 120). The millionaires were envisioned by Park to have created large-size plants to realize economies of scale. He saw the government's role as one of overseeing the millionaires to avoid any abuse of power.

The discipline exerted by the state, and the rise of big business, were interactive. Big business consolidated its power in response to the government's performance-based incentives. In exchange for stunning performance in the areas of exports, R&D, or new product introduction, leading firms were rewarded with further licenses to expand, thus enlarging the scale of big business in general. In exchange for entering especially risky industries, the government rewarded entrants with other industrial licenses in more lucrative sectors, thus furthering the development of the diversified business group in particular.

Discipline may be thought of as comprising two interrelated dimensions: (a) penalizing poor performers; and (b) rewarding only good ones. Evidence of the former has taken two guises in Korea. First, in industries weakened at various times by over-expansion (some heavy industries, construction, shipping), firms have been subject to rationalization, as discussed in Chapter 5. Second, discipline has taken the form of refusal on the part of the government to bail out relatively large scale, badly managed, bankrupt firms in otherwise healthy industries. The bail-out process has been highly politicized insofar as the government has typically chosen close friends to do the taking over of troubled enterprises (the production facilities of troubled enterprises are never allowed to rot). This corruption notwithstanding, when the victim of bankruptcy has appeared to be poorly managed, the government has deserted it.

One finds evidence of the government's cold-bloodedness towards poorly managed firms in distress in a variety of otherwise prosperous industries. For example, a company named Shinjin had a larger market share in the Korean automobile industry in the 1960s than Hyundai Motors. Shinjin's owner, however, could not survive competition from Hyundai's "Pony" and the oil shock in the 1970s. The company went bankrupt and the government, as banker, transferred Shinjin's holdings to Daewoo Motors. Another early automobile manufacturer, Asia Motors, was also abandoned (Amsden and Kim, 1985). In the cement industry, the largest producer in the 1970s went bankrupt because it tried to optimize an old technology rather than switch to a new one. Its production facilities were transferred by the government to a *chaebol*, the Ssangyong group, owned by one of the ruling party's elders. The Taihan group, a pioneer in the electronics industry, had an ailing consumer electronics division which failed. Eventually the government oversaw its transfer to Daewoo Electronics. Construction firms such as Kyungnam (merged into the Daewoo group) and Samho (acquired by Daelim Engineering) are typical cases of firms that although they once enjoyed government support, were abandoned after going bankrupt—when other firms in their industry were prospering—for reasons which observers generally agree were related to incompetence. A badly managed *chaebol* of considerable size that the government recently punished with dismemberment was the Korea Shipbuilding and Engineering Company. The Kukje-ICC group has also been pilloried.

Of greater importance to the credibility of the disciplinary process in Korea than punishing poor performers, however, has been insur-

ing that the government's friends—most of whom have undoubtedly been bailed out on at least one occasion—have generally performed well. This dimension of discipline has been critical because so much of Korean industrialization has involved rewarding the same small set of government friends with favors for expansion. The chapters that follow, therefore, concentrate on providing evidence that repeated support by the government to a small set of big business groups was exchanged, *de facto*, for good performance. Good performance is evaluated in terms of production and operations management rather than financial indicators. Evidence comes from fairly detailed case studies of approximately thirty-five enterprises in the textile, cement, paper, steel, shipbuilding, general machinery, automobile, and construction industries. Several subsidiaries within a business group were studied (five in the case of Hyundai, three in the case of Samsung) to analyze, among other issues, whether repeated patronage by the government was justified on efficiency grounds.

The sternest discipline imposed by the Korean government on virtually all large size firms—no matter how politically well connected—related to export targets. There was constant pressure from government bureaucrats on corporate leaders to sell more abroad—with obvious implications for efficiency. Pressure to meet ambitious export targets gave the Big Push into heavy industry its frenetic character. Additionally, firms have been subject to five general controls in exchange for government support.

First, the government has owned and controlled all commercial banks. One of the first acts of the government of Park Chung Hee was to nationalize the banking system. (The government of Syngman Rhee had denationalized it a decade earlier to appease American pressures.) Although pressures to liberalize in the 1980s led the government to privatize commercial banks, thereby strengthening aggregate economic concentration and income inequality, the government maintained its control over commercial banking.[11] Government control of the purse has helped orient the chaebol toward accumulating capital rather than toward seeking rents.

Second, in luring firms to enter new industries with the plums of protection and subsidies, the government has imposed discipline by limiting the number it has allowed to enter (although usually to not fewer than two firms per industry). This has ensured the realization of scale economies and the rise of the mammoth business groups that the government foresaw as necessary to build basic industry. In the 1960s and 1970s, the government became premier entrepreneur by using its industrial licensing policies to determine what, when, and how much to produce in milestone investment decisions.[12]

Third, discipline has been imposed on "market-dominating enterprises" through yearly negotiated price controls, in the name of curbing of monopoly power. At the end of 1986, as many as 110 commodities were controlled, including flour, sugar, coffee, red pepper, electricity, gas, steel, chemicals, synthetic fibers, paper, drugs, nylon stockings, automobiles, and televisions.[13]

Fourth, investors have been subject to controls on capital flight, or the remittance of liquid capital overseas. Legislation passed in the 1960s (T'ŭkpyŏl pojen kaching chŏbŏlpŏp) stipulated that any illegal overseas transfer of $1 million or more was punishable with a *minimum* sentence of ten years' imprisonment and a maximum sentence of death. In the 1980s, the degree of compliance with the law has fallen into doubt.[14] Nevertheless, in the two preceding decades, its harsh terms are believed to have been a credible deterrent to private

[11] Korea has a reputation for relatively equitable income distribution; yet the statistics on income distribution published by the Korean government and the Korea Development Institute in the 1980s are improbable. (See for example, the figures contained in a paper by Suh and Y. H. S. Cheong, 1986.) They purport to suggest that the size distribution of income in Korea is still highly equitable by comparison with the developing countries. (For early results on income distribution in Korea, see Chenery and Ahluwalia, 1974.) Yet these findings are counterintuitive, because Korea's rate of aggregate economic concentration and wage inequalities are among the highest in the world (suggested in later chapters). Official measures of income distribution also ignore the "informal sector," which is huge. (See an unpublished paper prepared for the World Bank by Bhalla, 1979.) The statistical findings by the Korean government and Korea Development Institute of relatively equitable income distribution partly arise from the fact that income is fairly equitably distributed in agriculture, and even in the 1980s agriculture accounted for about 30% of employment. A study by Choo (1987) indicated that income distribution is more equitable for agricultural households than for nonagricultural households (both workers and self-employed). See also the discussion in Chapter 2 on the distribution of wealth.

[12] In the 1980s the government "liberalized" industrial licensing but still exerted control over who could enter new or old industries, or expand capacity, by means of the following measures: (1) the Korean Antitrust Law, which prohibits firms from controlling more than 40% of the assets of their subsidiaries (this measure is designed to control the chaebol's ability to expand/diversify); (2) credit controls, which set ceilings on debt-equity ratios and/or debt-sales ratios (to control further the chaebol's ability to expand/diversify); (3) a ban on large firm's entry into industries designated for small- and medium-size firms; (4) a ban on large firm's entry into industries which supply large firms; and (5) a ban on expansion in, or entry into, industries subject to government "rationalization."

[13] Kyŏngje Kihoekwŏn (1986).

[14] Still, a bankrupt shipping magnate was believed to have committed suicide in 1987 for fear of being prosecuted under the law's terms. See *BK* (1987a). K. M. Kim (1987) discussed the extent of capital flight and legislation to control it. Kim said Morgan Guarantee figures on capital flight are exaggerated because they include direct foreign investments by Koreans, but that it is unthinkable that capital flight does not exist.

investors who might otherwise have used public subsidies to build personal fortunes abroad.

Fifth, the middle classes have been taxed, and the lower classes have received almost nothing in the way of social services. This has enabled a persistent deficit in the government account to reflect long-term investments.

It is unclear whether the strong economic measures taken by the Korean state could have been taken under political democracy, although Japan, the etatist European countries, and recent events in Korea all suggest that such measures and political democracy are compatible. What is clear is that, without a strong central authority, a necessary although not sufficient condition, little industrialization may be expected in "backward" countries. Even getting relative prices "right" according to textbook theory would require a state strong enough to battle whoever stood to suffer from a loss of government support.

THE PROCESS OF CATCHING UP

Landes (1969) mentioned labor supply only briefly in his analysis of catching up, and he certainly did not view abundant labor as Europe's competitive asset in industrialization. To the contrary, he saw the attainment of competitiveness by learners in the nineteenth century as being burdened by low labor costs. He argued that after industrialization gained momentum in Britain, the same abundant supply of impoverished rural laborers that had made possible Europe's prefactory industry began to act as "a deterrent to mechanization and concentration" (p. 139). For Gerschenkron (1962) as well, labor did not lend a competitive advantage to late developers because a suitable labor force did not exist: ". . . industrial labor, in the sense of a stable, reliable, and disciplined group that has cut the umbilical cord connecting it with the land and has become suitable for utilization in factories, is not abundant but extremely scarce in a backward country" (p. 9).

The creation of competitiveness on the basis of an abundant, relatively well-educated labor supply is the key difference of latter-day twentieth-century learning. In the nineteenth century, the United States and Germany caught up with Britain on the basis of innovation, not on that of cheaper labor. As we shall see in a later chapter, even when Japan penetrated deeper into world markets after the turn of the century, its cheap labor was but one of several assets it used to gain market share. Therefore, the conquest of world markets, beginning in the mid 1960s, by late-industrializing countries on the *almost* exclusive basis of low wage rates represents a new phenomenon, a truly new international division of labor. Nevertheless, firms have still had to be subsidized in order to compete, even before any attempts to move beyond the light manufactures, and certainly after.

After a country invests in labor-intensive manufactures, the next logical step, from both a technical and demand-side point of view, is to invest in heavy industry. Subbranches of heavy industry prosper even in small countries, as evidenced by the composition of industry in Austria, Belgium, and Switzerland. (The only advanced country that does not appear to have some heavy industry is Denmark.) Yet the heavy industries have drawn criticism from economic historians and advisors alike for being an irrational symbol of liberation from backwardness and a violation of comparative advantage.

Symbolism apart, the real significance of the heavy industries for late industrialization lies in the turning point they represent for the unit of production and the basis on which this unit competes. First, with the heavy industry sector comes the modern industrial enterprise, and hence salaried management. The salaried management of the cotton spinning and weaving industry in Korea is far less professional than that of the heavy industries. Second, with the heavy industry sector comes a new mode of competition—oligopoly. Of equal significance, the transition from light to heavy industry involves a transition from competing on the basis of cheap labor to competing on the basis of modern facilities and skills, given whatever labor costs made entry possible. It usually follows that the target of competition is directed away from low-wage firms to firms that are also competing on the basis of modern facilities and skills, whatever their initial entry costs. Such firms tend to be found mainly in advanced countries. For late industrializers, therefore, the transition from light to heavy industry involves a transition from competing against firms from other low-wage countries to competing against firms from high-wage ones that have access to vastly more experience and technical expertise.

Complicating the process of catching up for late-industrializing countries is the fact that the progression from light to heavy industry has not been undertaken by the same set of firms. In Korea, leading firms in the light industries did not become the leading firms in the more technically complex industries, with the exception of electronics. The production of black-and-white television sets allowed big chaebol like the Samsung and Lucky-Goldstar groups to advance from assembly to higher value-added activities in consumer electronics, and from there to computer electronics. Nevertheless, electronics products accounted for a small share of total exports—only 10% in 1976 (before the rise of heavy manufactured exports) and only 11% in

1984, afterward (Bank of Korea, various years [a]). Korea's major exports from 1965 to 1975 were apparel, cotton textiles, and miscellaneous manufactures. In the case of cotton spinning and weaving, there were almost no technical or managerial linkages to newer industries. The cotton textiles firms that benefited internally from international competition in the form of exposure to better management techniques and improved production processes did not serve as the organizational building blocks for the economy's more skill- and capital-intensive pursuits. None of the leading chaebol evolved from a base in cotton textiles (although one had a base in worsteds). With profit-maximizing horizons that were short term, entrepreneurs who were conservative, and managers who were oriented more toward the art than the science of production, cotton textiles firms did not become the agents of further industrialization.

Catching up, therefore, was an involuted process, as discussed in Part III of this book. The dynamic driving comparative advantage involved a discontinuity, the leading sector of the 1960s not providing the initiative for diversification in the 1970s. It was also the diversified business group that tended to penetrate new industries, not the specialized single-product firm, making the dynamics of dynamic comparative advantage all the more different from the textbook case (see Chapter 10).

OVERCOMING TECHNOLOGICAL IGNORANCE: FROM RENT-SEEKING TO INVESTING

Whatever the time period and whatever the firm structure, learners rely heavily on foreign know-how to narrow the gap. If they are to be at all successful at learning, they visit international expositions, attend conferences and lectures, read technical journals, hire experienced workers, visit overseas plants, engage foreign technical assistants, consult machinery suppliers, and buy, borrow, beg, and steal foreign designs. The form of technology acquisition has tended to change, however, as technology itself has become more science-based and as the firm has come to be viewed less as a means to earn a livelihood and more as a means to earn a profit. The central tendency has shifted from the absorption of foreign technology through copying and self-teaching to the adoption of foreign technology through investing in foreign licenses and technical assistance. The former mode of technology acquisition may be called *imitation*, and the latter, *apprenticeship* (see Amsden and Kim, 1985b).

In Korea, massive imports of foreign licenses and assistance have been viewed as a means to attain technological independence, and thus as part of a larger effort, in both the public and private spheres,

to avoid foreign control. Industrialization has occurred almost exclusively on the basis of nationally owned rather than foreign-owned enterprise. Foreign technical assistance has been purchased in preference to depending on foreigners to run Korean plants. Whether in Korea's shipyards, steel mills, machinery works, automobile plants, or electronics factories, the credo has become, "Invest now in in-house technological capability—even if outside expertise is cheaper—to reap the rewards of self reliance later."

To understand how Korea attained competitiveness, it is necessary to understand the nature of the technological backlog that Korea, and other late learners like it, borrowed. This is most easily accomplished by drawing a comparison between Korea and a still earlier industrializer, Germany, during the stage of its catching up. Veblen has written on imperial Germany, the forerunner not just of Korea but also of Japan. He drew a comparison between Germany's assimilation of foreign technology and England's borrowing from Continental Europe during the period of Tudor rule. According to Veblen,

> The necessary technological proficiency of Germany was of a kind to be readily acquired; much more so than the corresponding technological proficiency acquired by the English in Tudor times by borrowing from the Continent. In this earlier English case what had to be borrowed and assimilated was not only a theoretical knowledge and practical insight into the industrial arts to be so taken over, but a personal habituation and the acquisition of manual skill on the part of the workmen employed; a matter that requires not only insight but long-continued training of large numbers of individuals—apprenticeship. . . . (1915, p. 187)[15]

By contrast, Veblen also argued,

> The technology which Germany borrowed in the nineteenth century is a different affair in respect of the demands which it makes on the capacities and attention of the community into which it is introduced. It is primarily an affair of theoretical knowledge, backed by such practical insight into its working conditions as may be necessary to the installation of the mechanical equipment. In all this there is little of an obscure, abstruse or difficult kind, except for such detailed working out of technological applications of theory as call for the attention of expert specialists. (p. 188)

[15] In the next four paragraphs, all page references are to Veblen.

Like the Germans before them, Korean firms were generally not taxed by the need for their operatives to acquire manual skills. Few worker apprenticeships existed in Korea, and formal vocational training did not commence immediately even in some of the largest firms. Although the chaebol sent vast numbers of employees abroad for training, the incidence was greatest at the upper end of the job hierarchy—although inclusive of foremen. And whereas large numbers of technical assistants from abroad consulted in Korea, including operatives with specialized skills, little effort was made to have them settle in Korea. A far graver problem for Korea than for Germany, however, was the acquisition of theoretical knowledge. The problem for Germany, according to Veblen, was minor, and was soon manifested by Germany's success at innovating. Korea, on the other hand, lacked theoretical knowledge at the world frontier, not only in the machinery-building sector, which Veblen dwelt on, but also in the continuous-process industries and, to an acute degree, in electronics. The benefits of backwardness notwithstanding, therefore, the shift of the world technological frontier in the century after Germany industrialized left Korea relatively further behind, and made it more difficult for Korea to solve what even for Germany was the most intransigent problem of technology transfer: the detailed working out of technological applications of theory.

The problem of technology transfer, however, cannot be seen merely in technical terms. Socially, it touched on the tribulation common to all early capitalist development: of getting adventurers in the field of business to take technology seriously. According to Veblen, what contributed to the triumph of manufacturing over finance as the dominant mode of profit-making in Germany was that, "These German adventurers in the field of business, being captains of industry rather than of finance, were also free to choose their associates and staff with a view to their industrial insight and capacity rather than their astuteness in ambushing the community's loose change" (p. 194). The German production engineers who were hired advanced the notion that industrialization depended on technical competence. Veblen stated,

> The responsible staff and corps in these industries, being men who had come through the schools instead of through the country store and the pettifogger's law office, were not incapable of appreciating that range of theoretical and technical knowledge that is indispensable to the efficient conduct of modern industry; and so the German industrial community was as surely and unresistingly drawn in under the rule of the technological expert as the American at about the same period [the late nineteenth century] was drawn in under the rule of the financial strategist. (pp. 195–6)

It would be an exaggeration to say that the industrial community in Korea became "surely and unresistingly" drawn in under the rule of the technological expert, because, by world standards, there were no experts in Korea. Nevertheless, like their German counterparts, the production engineers who were the gatekeepers of technology transfer came through the schools. And in a society hungry to catch up, with a steadfast faith in the value of education, the practical knowledge that these professionals wielded went a long way toward winning them influence and esteem. The industrial community in Korea, therefore, became "surely and unresistingly" drawn in under the rule, if not of the expert, then of the technological trainee. Once the entrepreneurs recognized that government subsidies could make manufacturing activity profitable, and that Korean engineers could build ships that floated and steel that bore weight, they increasingly turned their attention away from speculating toward accumulating capital.

Symptomatic of the passionate desire to organize and hasten the process of catching up, the Koreans pushed ahead with forming a native cadre of engineers and technicians. The number of schools in both Germany and Korea was large, unusually so by contemporary standards. The plain fact of the matter is that Korea was a successful learner partly because it invested heavily in education, both formal and foreign technical assistance (see Chapter 9).

The preponderance of foreign technical assistance came from Japan, a fact that gave Korea an edge over other late-industrializing countries that were culturally and geographically further afield than Korea from Japan. Japan may not have been as close to the world technological frontier as the United States, or as generous in transferring its proprietary know-how, but it emerged as the world's premier producer, and communicated to Korea both the most efficient production techniques and a seriousness about the manufacturing function.

PLAN OF THE BOOK

This book is divided into three parts. Part 1 surveys Korean history and the origins of state policies that led to the successes of Korean late industrialization. Part 2 examines the ways that Korean management and the work force were transformed into major factors in the growth of Korean industry. Part 3 discusses the creation of comparative advantage in several industries and the reasons why one only kept pace with expansion while the others drove it.