



**EE482 Industrialization: Role of Public and Private
Sectors (Section 046401)
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**Chapter 3
Industrialization in South Korea**

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Chapter 3

Industrialization in South Korea

3.1 Introduction

Japan has shown a path to economic development by using targeted industrial promotion as the main mechanism. The process begins with reaching agreements and consensus among all stakeholders in the development plan, focusing on top-down stimulus processes and aiming to export targeted industries. South Korea has adopted and successfully implemented this approach. In the case of South Korea, there are many disadvantages compared to Japan, mainly due to the lack of a long-standing industrial and trade system like Japan. Additionally, South Korea started its development from a much lower level (after the Korean War, South Korea had a significantly lower average income per capita than Ethiopia). Furthermore, all the target industries selected by South Korea were already led by Japan and other developed countries in the market. Therefore, studying the details of industrial development and increasing average income per capita in South Korea is essential as a foundation for analyzing the development strategies of other countries in the future.

The content in this chapter is arranged chronologically and in the order of the push for target industries (or new s-curve industries) in South Korea. These four target industries include steel, petrochemicals, automobiles, and electronics. This leads to the linkage of the expansion of production capacity and the enhancement of competitiveness in South Korea's industrial sector, shifting towards new branches that generate greater added value in each 10-year development period.

3.2 Korea's Economic Development: The Miracle on the Han River

The success of South Korea's economic development has become a model for other countries around the world. This development strategy has been cited and encouraged in speeches and articles by various individuals.

Box 3.1: Quote from former U.S. President Barack Obama, delivered in the Ghanaian Parliament during his first visit to Africa

“... But even with progress, very often, it is not as if we've achieved all the development that was promised. Countries like Kenya, where I was born, had a larger economy than South Korea when I was born, but South Korea raced ahead, in part because disease and conflict had swept through parts of Africa... And what history shows us is that countries thrive when they invest in their people, in infrastructure [applause], when they promote multiple exports, develop a skilled workforce, and create space for small and medium-sized businesses to flourish by creating jobs ... “

Source: <https://web.archive.org/web/20160227060205/https://www.whitehouse.gov/administration/president-obama>,



Figure 3.1: Former U.S. President Barack Obama

Source: <https://obamawhitehouse.archives.gov/the-press-office/remarks-president-ghanaian-parliament>

Box 3.2: Writings of Robert E. Lucas Jr., Nobel Laureate in Economics 1995

“... .to narrate a story” fits Chong-gye stream in the heart of Seoul very well. Chong-gye stream illustrates the transformation and upliftment of the living standards of the Korean people over the past several decades.

The dilapidated old houses in Seoul in the 1950s have been replaced by modern buildings by the 2000s. This economic development, from poverty to prosperity, has been referred to as the “Miracle on the Han River.” Robert Lucas Jr., a Nobel laureate in economics, commented on South Korea's development by saying:

“I don't think it's overreaching to call South Korea's economic transformation a miracle... The quality of life for many people has improved at an unprecedented pace, and I don't see development slowing down in the near future...”

Source: Chun, S.H. (2018). The Economic Development of South Korea: From Poverty to a Modern Industrial State. London: Routledge.



Figure 3.2: Robert E. Lucas Jr., Nobel Laureate in Economics 1995

Source: <https://www.nobelprize.org/prizes/economic-sciences/1995/lucas/biographical/>



Figure 3.3: Cheonggyecheon stream during 1910-1945

Source: Korean book "Seoul under Japanese rule (1910-1945)" published by Seoul Metropolitan City History Committee.

During the Chosun period (1392-1897), Chong-gye stream was a canal flowing through the heart of Seoul from east to west.

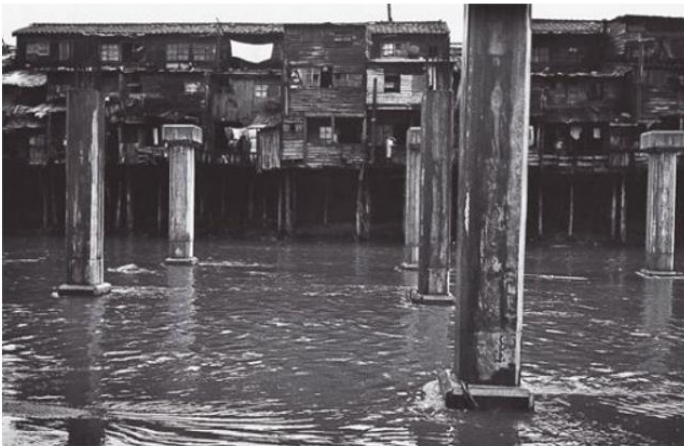


Figure 3.4: Cheonggyecheon stream in 1950s

Source: <http://cheonggyecheonrestorationproject.blogspot.com/p/site-history.html>



Figure 3.5: Cheonggyecheon stream in 1950s

Source: D. Seo and Y. Kwon (2018) IOP Conf. Ser.: Earth Environ. Sci. 143 012068
(<https://iopscience.iop.org/article/10.1088/1755-1315/143/1/012068>)



Figure 3.6: Cheonggyecheon stream in 1950 VS 2018

Source: https://www.reddit.com/r/korea/comments/8jua0q/cheonggyecheon_in_1950s_vs_2018/

3.3 Historical Background

President Park Chung-hee was both a leader in industrial development thinking and a designer of South Korea's social institutions as part of his commitment to transforming the country into an industrial nation. It is widely acknowledged that President Park attempted to emulate Japan's economic development model. However, he publicly accepted Germany's development path rather than Japan's because Germany had a significant influence on Japan's political economy. His acceptance of Germany can be seen as a way to downplay his preference for Japan.

The prototype of the New Asian State (Japan) drew influence from Germany in terms of social development, politics, and economics. Ito Hirobumi, Japan's first Prime Minister, drafted the Meiji Constitution, modeling it after the Russian constitution and rejecting the British constitution as a template in 1890. Similarly, in the 1920s and 1930s, Chiang Kai-shek, the founding leader of the Republic of China, admired the discipline and order of German nationalism. He wrote a letter to his son, who was sent to study at a military academy in Munich, saying:

"Germany is the only country from which we can learn something. Learning from them (the German nation) can be the foundation for us (China) to develop our own stable and strong state."

President Park and his close associates were former officers of the Japanese army stationed in Manchuria during the 1930s and 1940s. During this period, President Park and his associates observed Japan's heavy industrial development led by the Japanese military and technocrats. Their collaboration with the Japanese military in Manchuria played a significant role in accelerating South Korea's heavy industrial development in the 1970s.

Furthermore, Japan's post-World War II economy was the result of reapplying the Manchuria system that had previously been used in the 1950s. This was led by former Manchurian bureaucrats who had previously served in Manchuria. President Park adapted the Manchuria system to South Korea's economy in the 1970s, similar to how Japan had applied it in the 1950s.

The economic system in Manchuria during the 1930s originated from the adaptation of Germany's political-economic system by the Japanese military and technocrats during the Meiji reforms of the 1880s until World War II. The leaders in East Asia were keen on modernization and Westernization to avoid becoming colonies of the West. They aimed to develop industries rapidly and modernize their militaries with the ultimate goal of challenging Western imperialism. For the leadership in East Asia, Westernization meant adopting the practices of only a few Western countries, including the United Kingdom, the United States, and France.

In contrast, the leadership in East Asia viewed Germany as a new state that was not part of Western imperialism in European continental land. They believed that Germany's rise to power in the late 19th century served as a model for East Asia to rise and challenge the power of the United Kingdom, France, and the United States. Germany's victory over France in the Franco-Prussian War was particularly noted as a significant achievement. This was well recognized among military leaders in China and Japan. The military leaders of both China and Japan were eager to collaborate with Germany to develop industries and modernize their armies from the 1910s to the 1940s.

The Japanese army and leading technocrats who had studied in Germany during the 1920s played a leading role in the invasion and occupation of Manchuria, the northeastern part of China. Drawing from their education in Germany, both the Japanese military and technocrats implemented heavy industrial development in Manchuria, similar to the Nazi German model. Besides the economic ideas, Germany's influence on the military and the economies of China and Japan during the Second Sino-Japanese War (1937-1945) was instrumental in shaping the post-war political and economic landscape in East Asia.

As presented in Chapter 2, the rise to power of leaders from the Satsuma and Choshu regions had significant implications for the history of East Asia in the 20th century. Both regions are located on the far western edge of Japan and are geographically closest to Korea. Furthermore, both Satsuma and Choshu were free domains that had legal and relatively independent contact with Westerners.

Both regions served as gateways to learning from Dutch studies during a period when Japan was awakening to Western knowledge, as discussed in Chapter

1, concerning Dutch ship arrivals in Japan. Young samurai from these regions played pivotal roles in the Meiji Restoration and the Japanese annexation of Korea. Among them, Okubo Toshimichi, a passionate and influential statesman, played a significant role. He was a key figure in the Meiji Restoration, advocating for comprehensive social reforms to transition Japan beyond the Tokugawa and feudal systems. Okubo Toshimichi was the first pro-German politician in early Meiji Japan.

Toshimichi had a great admiration for Bismarck (the statesman of Germany) and traveled to Russia to seek advice from Bismarck. In 1873, Toshimichi journeyed to Europe to find a suitable governance model for Japan during the Meiji era. He concluded that Germany was the sole hope for Japan. Bismarck persuaded Japanese leaders that Germany was the best model for Japan. However, Toshimichi's ultimate policies sparked strong resistance and controversy about the direction Japan would take in the future.

One of Japan's key leaders was Ito Hirobumi, who became acquainted with Lorenz von Stein, a professor of political science at the University of Vienna. Stein provided lectures in English to Ito Hirobumi, and his lecture materials were widely distributed and became essential textbooks for Japan's leaders during the Meiji period.

Stein taught diverse theories to Ito, including constitutionalism, education, economics, sociology, and public administration. He discussed historical perspectives on the French Revolution and Europe's industrial revolution. He also highlighted that people in the 19th century were liberated from relying on agriculture and natural resources. Nevertheless, class antagonism emerged under the new system, and Stein pointed out that the root cause of class conflict was economic inequality in a society following the industrial revolution. People who were economically disadvantaged were affected, and they constituted a labor force that lacked capital ownership.



Figure 3.7: Lorenz von Stein

Source: Wikimedia Commons



Figure 3.8: Bust (white marble) in the Arkadenhof of the University of Vienna

Source: Wikimedia Commons



Figure 3.9: Ito Hirobumi (right) during his time as a samurai in the late Tokugawa era

Source: <https://jref.com/articles/ito-hirobumi.35/>



Figure 3.10: Ito Hirobumi

Source: <https://jref.com/articles/ito-hirobumi.35/>



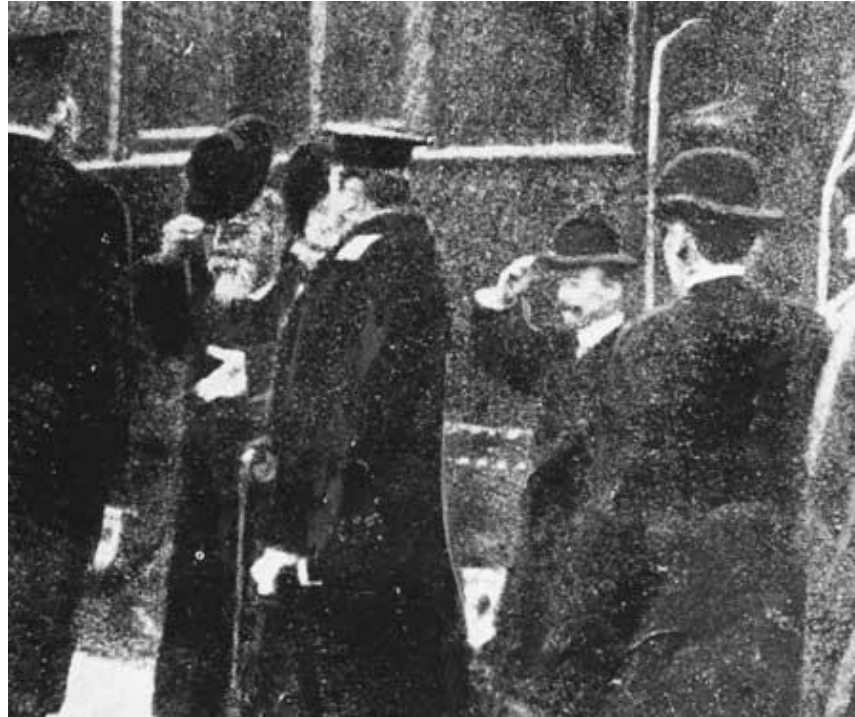
Figure 3.11: Ito Hirobumi while serving as the ruler of Korea with Crown Prince Yi Un (1897-1970) of South Korea

Source: <https://jref.com/articles/ito-hirobumi.35/>



Figure 3.12: Ito Hirobumi riding a horse in Korea during his tenure as the ruler of Korea.

Source: http://www.koreatimes.co.kr/www/news/nation/2011/09/363_95201.html



Hirobumi Ito, second from left, steps from the train in Harbin Railway Station, on Oct. 26, 1909. A few minutes later, he was killed by young Korean independence fighter Ahn Jung-geun. / Korea Times

Figure 3.13: Image of Ito Hirobumi shortly before he was assassinated, just a few minutes before

Source: http://www.koreatimes.co.kr/www/news/nation/2011/09/363_95201.html

Stein warned that Japan's industrialization would create pressure for economic activities and generate class conflicts that would disrupt social harmony. To overcome these class conflicts and maintain a morally upright political attitude that prioritized the collective welfare and social balance, Stein argued that Japan urgently needed to maintain social welfare for the entire community and create social policies to establish basic welfare and uplift the lower classes mentally.

Furthermore, Ito integrated the basic philosophy of Shinto, which was fundamental to Japan, into Stein's "new society with a unified spirit" concept. After returning to Japan, Ito supported the application of Germany's political, social, and economic structure in drafting a new constitution for Japan.

Stein lectured to Japanese bureaucrats and politicians who came to listen and seek advice in Vienna for several years, an initiative referred to as the "Stein mode."

Additionally, he provided written responses to Japanese politicians, bureaucrats, public relations officers, and teachers. Stein's teachings were instrumental in the careers of five Japanese disciples who went on to become prime ministers of Japan. One of the prominent disciples who played a significant role in planning Japan's industrial and economic system was Nobusuke Kishi (1896-1987). Kishi was involved in the establishment of Manchukuo and the design of the post-war Japanese political economy.

In his role as a leader in the government's economic policy for Manchukuo, Kishi received recognition for developing various state-controlled industrial policies. These policies served as models for post-World War II Japan and South Korea. Kishi's economic policies were based on the principles of Germany. He visited Germany to study the industrialization process and provided explanations and reasoning about Germany's industrialization from May to November in 1930. He submitted a report regarding the industrial control of Germany, which significantly influenced the economic development direction adopted by Japan afterward.



Figure 3.14: The Minister of Commerce and Industry Nobusuke Kishi called at childcare center near the Hanaoka mine in 1942

Source: Wikimedia Commons, the free media repository



Figure 3.15: Prime Minister Hideki Tōjō and minister Nobusuke Kishi. October, 1943

Source: Wikimedia Commons, the free media repository



Figure 3.16: Nobusuke Kishi (1896-1987, left) relaxes at the house of his brother, then-the-Chief Cabinet-Secretary Eisaku Satō (1901-75), shortly after he was released from the Sugamo Prison on 24 December 1948

Source: Wikimedia Commons, the free media repository

From his study in Germany, he pointed out the following:

"Explaining with reasoning, including various processes of German industry, emphasized the development of technology and innovation in the industry to install state-of-the-art machinery and equipment. Furthermore, what made Germany's processes outstanding was trust and cooperation with the government that played a supportive role, which is considered the main way to carry out reforms."

At the end of the war, Kishi survived war crime prosecution and emerged as a key figure in the most significant events in modern Japanese history. By taking on a leadership role in rebuilding the post-war economy, he eventually became the Prime Minister.

Kishi played a pivotal role in the establishment of the "Military-Industrial Complex" in Manchukuo. He was a military officer from Japan's Military Academy and a successful graduate of the Imperial University. He willingly introduced technology into the organization of the economic and heavy industrialization plan.

In the post-World War II era, the economic structure during the war remained fundamental in Japan and former colonies like South Korea and Taiwan. President Park Chung-hee established a state-controlled system in post-Korean War South Korea, developed by modeling it after Manchukuo's system. This was due to Park's previous position as a Japanese Imperial Army officer in Manchukuo during the war, which led to close relations with Japanese politicians and bureaucrats who had served in Manchukuo.



Figure 3.17: Shinzo Abe, the twice Prime Minister, from 2006 to 2007 and 2012 to 2020 is the maternal grandson of Nobusuke Kishi.

Source: Licensed under the Government of Japan Standard Terms of Use (Ver.2.0)



Figure 3.18: Nobuo Kishi, a brother of Shinzo Abe, is the maternal grandson of Nobusuke Kishi

Source: Wikimedia Commons, the free media repository

3.4 Trial and Error for State Building

South Korea has transformed into a new nation, which was established in the year 2491 B.E. under a democratic system. It had to face the task of nation-building in an environment characterized by severe challenges, including extreme poverty,

political instability, and social unrest, which posed significant obstacles to development.

In the initial period, the three essential conditions for nation-building consisted of:

- Reducing poverty.
- Ensuring societal security.
- The ability to defend the nation.

During the first 12 years, the South Korean government attempted to address these two challenges simultaneously, namely poverty and national security within a democratic framework. However, the government faced substantial difficulties. Besides external threats from neighboring countries, South Korea still lacked effective measures to alleviate poverty.

The government grappled with significant challenges as it had to manage internal forces of unrest due to ideological differences and military threats from the North. Moreover, the prevailing social instability hindered the government's efforts to reduce poverty effectively.

On the other hand, achieving social stability in an environment where poverty still prevailed proved to be unattainable. This persisted for over two decades, starting from the establishment of national institutions, with a focus on alleviating the people's suffering, post-war recovery, and maintaining social stability within the country. Nevertheless, the government could not achieve success in meeting its objectives. All these factors seemed to be the starting points for generating instability in both political and economic aspects, eventually leading to military coups."

3.5 Development Planning System

After seizing power for the first time in the country's history, South Korea implemented a five-year economic development plan as a mid-term strategy for transforming the nation. This was considered a daring leap with ambitious goals compared to the fundamentals of a market-oriented development system. It meant that, for example, basic investments and business decisions would be made by each

company individually, which, in principle, was not in line with the centrally planned economy commonly associated with socialist ideologies.

The leader of the military junta, Park Chung-Hee, was born in 1917 during Korea's period under Japanese colonial rule. His mother gave birth to him at the age of 45, making him the seventh child in the family. Park Chung-Hee completed his education at government schools and worked as an elementary school teacher for a while before eventually entering military service and later leading a military coup.

Cho Gap-jae (2007), a researcher who studied the life of President Park, defined him with two words: simplicity and independence. This description stems from Park Chung-Hee's upbringing in a humble family during a time when the country was under colonial rule. These values and attitudes appeared to be deeply ingrained in him throughout his life



Figure 3.19: Park serving the Imperial Japanese Army

Source: Wikimedia Commons, the free media repository



Figure 3.20: Park Chung-hee and Song Ho-sung in 1948

Source: Wikimedia Commons, the free media repository



Figure 3.21: Park Chung-Hee in 1961

Source: Wikimedia Commons, the free media repository



Figure 3.22: President John F. Kennedy (sitting in rocking chair) meets with General Chung Hee Park (wearing glasses and sitting on couch)

Source: Wikimedia Commons, the free media repository



Figure 3.23: U.S. President Lyndon B. Johnson and First Lady Lady Bird Johnson with South Korean President Park Chung-hee and his wife Yuk Young-soo (second from right), during their official state visit to White House

Source: Wikimedia Commons, the free media repository



Figure 3.24: Park Chung-hee pours champagne onto the street during the opening ceremony of the Seoul-Busan Expressway in Daegu City on July 7, 1970. (Completed in just over two years, the construction of the 428-kilometer expressway began Feb. 1, 1968, mobilizing more than 9 million workers.)

Source: http://www.koreatimes.co.kr/www/news/nation/2011/10/363_92553.html

The government, under President Park Chung-Hee, recognized the need to establish specialized agencies responsible for economic development. These agencies were subsequently created in the form of the Economic Policy and Economic Planning Board (EPB). This organization was established within 10 days of the military coup and had three main responsibilities: economic planning, budget preparation, and attracting foreign investments.

To facilitate policy coordination among ministries, budget allocation responsibilities were transferred from the Ministry of Finance to the EPB. This move was intended to ensure alignment in policies across various ministries. Furthermore, the highest-ranking officials in the EPB were concurrently appointed as Deputy Prime Ministers to effectively control policies and coordinate the work of other ministries.

In addition, think tanks, such as the Korea Institute of Science and Technology (KIST) and the Korea Development Institute (KDI), were established in 1966 and 1971, respectively. These think tanks were created to conduct research that would

support the government's development policies, with full government backing. These think tanks excelled in technological development and accumulating data and research for economic development strategies. They played a significant role during the early stages of the development process.



Figure 3.25: Korea Development Institute: KDI

Source: Wikimedia Commons, the free media repository



Figure 3.26: Korea Institute of Science and Technology: KIST

Source: Wikimedia Commons, the free media repository

Under the framework of the first five-year economic development plan (1962-1966), the focus was on economic recovery through the promotion of exports and increased food production. This initial plan was crafted with technical knowledge and recognized deficiencies in the workforce. The first plan served as a crucial tool for driving the economy forward and achieving its goals effectively. The second five-year economic development plan (1967-1971) was built upon the foundation of the first plan, emphasizing continued development. It also served as an inspiration for future government officials and planners in the long-term development effort.

- The Third Plan (1972-1976) aimed at promoting heavy and chemical industries (HCI) with the goal of becoming a highly industrialized country.
- The Fourth Plan (1977-1981) underwent significant changes, shifting from a focus solely on growth to emphasizing growth, income distribution, and efficiency simultaneously. It also integrated social development projects into the country's main development framework for the first time.
- The Fifth Plan (1980-1986) brought about another transformation, moving from an economic development-focused plan to one that emphasized both economic and social development concurrently.
- Following this concept, it led to a name change from the Economic Development Plan to the Social and Economic Development Plan, which took place during the Sixth Plan (1987-1991).

The Economic and Social Development Plans of South Korea		
Plan	Years	Emphasis
First	1962-1966	Electrical Power, Fertilizer Production, Petroleum Refining, Cement, Synthetic Fibers
Second	1967-1971	Steel, Machines, Chemicals and Modernization of Industry
Third	1972-1976	Iron & Steel, Transport Equipment, Machines, Ships, Petrochemicals, Electronics
Fourth	1977-1981	Iron & Steel, Machines, Ships, Petrochemicals, Electronics, Nonferrous Metals
Fifth	1982-1986	Precision Machinery, Electronics and Higher Technology Industries
Sixth	1987-1991	Higher Technology, Research & Development, Manpower Training
Seventh	1992-1996	Microelectronics, Bioengineering, Aerospace, Fine Chemicals

Figure 3.27: Summary of the objectives of the first 7 Economic Development Plans

Source: Watkins, T. *The Economic Development Plans of South Korea*. Department of Economics, San José State University (<https://www.sjsu.edu/faculty/watkins/watkins.htm>)

	Agriculture, Forestry, Fishery	Manufacture, Mining	Utilities, Construction	Services
1954-56	44.6	12.0	3.2	40.2
1957-61	39.1	15.0	4.2	41.5
1962-66	40.0	18.1	4.4	37.5
1967-71	28.0	21.8	6.3	43.9
1972-76	24.5	26.7	5.8	43.0
1977-81	18.3	30.0	9.2	42.6
1982-86	13.5	30.2	10.9	45.4

Figure 3.28: Sectoral Origins of GNP

Source: Kim, K.S. (1991). The Korean miracle (1962-1980) revisited: Myths and realities in strategy and development. Working Paper #166. The Helen Kellogg Institute for International Studies.

	1963	1964	1965	1966	1967	1968	1969	1970
South Korea	50.3	56.0	57.0	57.4	58.8	57.6	56.3	52.5
Philippines	43.6	43.4	45.6	46.7	46.7	-	-	-
Singapore	47.7	47.3	47.2	47.4	47.4	48.3	49.2	-
Thailand	45.7	45.7	45.7	51.3	51.3	-	47.8	-

Figure 3.29: Per Worker Man-Hours in Selected East Asian Countries

Source: Kim, K.S. (1991). The Korean miracle (1962-1980) revisited: Myths and realities in strategy and development. Working Paper #166. The Helen Kellogg Institute for International Studies.

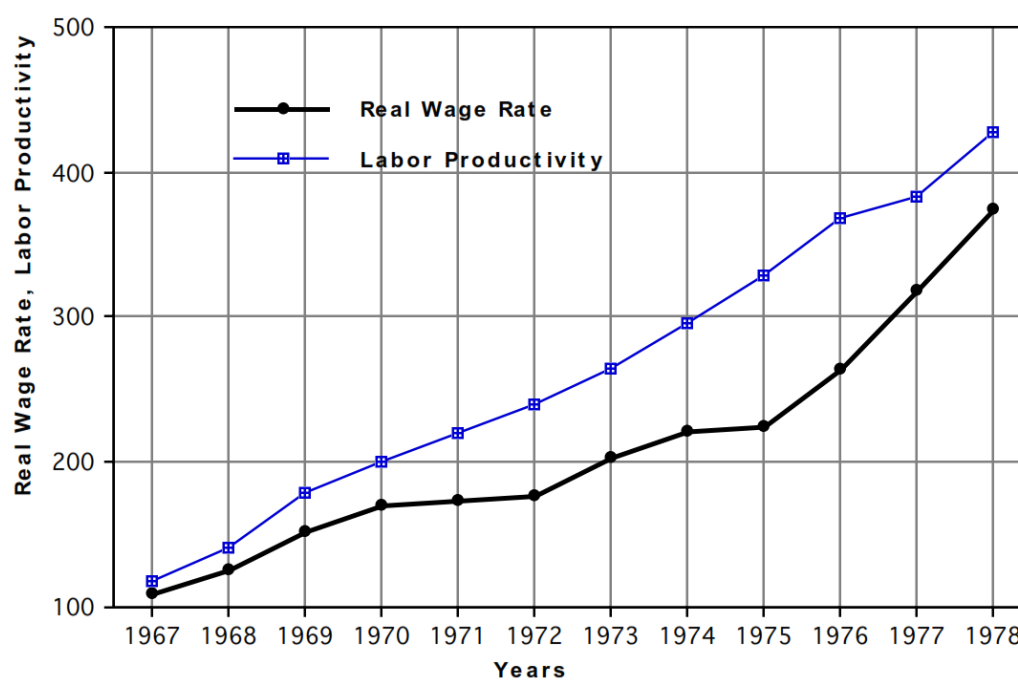


Figure 3.30: Real Wages and Labor Productivity in Manufacturing

Source: Kim, K.S. (1991). The Korean miracle (1962-1980) revisited: Myths and realities in strategy and development. Working Paper #166. The Helen Kellogg Institute for International Studies.

	% of Income Received		Gini Coefficient
	by upper 20%	by lower 20%	
1965	41.8	5.8	0.344
1970	41.6	7.3	0.332
1975	45.3	5.7	0.392
1980	45.4	5.1	0.389
1985	43.7	6.1	0.363

Figure 3.31: Trends in Income Distribution

Source: Kim, K.S. (1991). The Korean miracle (1962-1980) revisited: Myths and realities in strategy and development. Working Paper #166. The Helen Kellogg Institute for International Studies.

	Unincorporated Business		Wages and Salaries	Property Income ¹	Others ²	Total
	Agriculture	Nonagriculture				
1965	32.7	19.2	31.8	10.6	5.7	100.0
1970	24.3	16.5	39.5	13.9	5.8	100.0
1975	23.5	17.3	38.4	12.7	8.0	100.0
1980	14.6	12.3	49.4	17.5	6.2	100.0

¹ Profits, dividends, rents, corporate net savings, and transfers.

² Government enterprise profits and statistical errors.

Figure 3.32: Sources of National Income

Source: Kim, K.S. (1991). The Korean miracle (1962-1980) revisited: Myths and realities in strategy and development. Working Paper #166. The Helen Kellogg Institute for International Studies.

Items	Remarks	Unit	1962	1965	1970	1975	1980	1981
GNP		Millions of 1975 U.S. dollars	1,362	1,428	2,009	2,023	2,098	2,115
	Growth rate	%	2.2	5.8	7.6	7.1	-6.2	6.4
	Per capita GNP	U.S. dollar	87	105	243	574	1,481	1,607
Indices of	Total index	1975 = 100	10.5	13.7	37.4	100.0	209.8	231.7
Industrial	Mining	1975 = 100	44.8	59.1	71.3	100.0	111.2	119.1
Products	Manufacturing	1975 = 100	9.2	11.9	35.3	100.0	215.9	238.8
	Electricity	1975 = 100	9.9	16.4	46.2	100.0	187.7	202.7
Foreign Trade	Exports (FOB)	Million dollars	54.8	175.1	835.2	5,081.0	17,504.9	21,253.8
	Imports (CIF)	Million dollars	421.8	463.4	1,984.0	7,274.4	22,291.7	26,131.4
Price index	Wholesale	1975= 100	16.1	28.8	42.0	100.0	225.2	275.8
Foreign exchange holdings		Million dollars	168.6	146.3	609.7	1,550.2	6,571.4	6,891.0
Unemployment	Rates	%	-	7.4	4.5	4.1	5.2	4.5
Population	Mid-year	1000 persons	26,513	28,705	32,241	35,281	38,124	38,723
	Growth rate	%	2.90	2.57	2.21	1.70	1.57	1.57

Figure 3.33: Regional Index 1962-1981

Source: Kim, K.S. (1991). The Korean miracle (1962-1980) revisited: Myths and realities in strategy and development. Working Paper #166. The Helen Kellogg Institute for International Studies.

3.6 Stepwise Strategy for Industrial Development in Korea

The South Korean government employed a development approach following the steps outlined in Figure 3.34, which the government followed in every targeted industry. Throughout South Korea's development, the government would select new target industries every 10 years to elevate industrial capabilities and increase value-added contributions to the country.

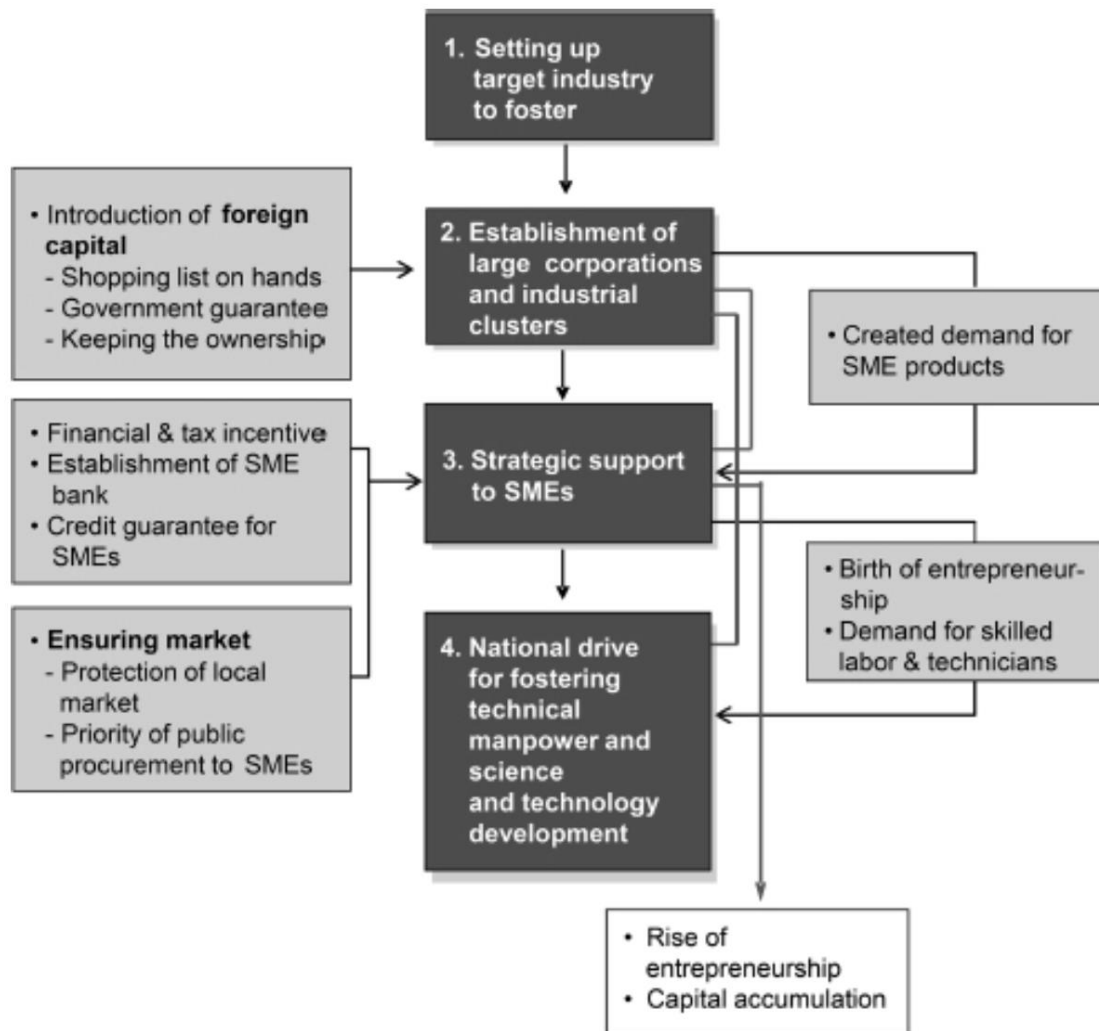


Figure 3.34: Flowchart depicting Stepwise strategy for industrial development in Korea

Source: Chun, S.H. (2018). *The Economic Development of South Korea: From Poverty to a Modern Industrial State*. London: Routledge

Strategies for Industrial Development in South Korea

Stage 1

The process begins with the selection of target industries, derived from the analysis of resources and industry needs. The government has established a long-term strategy that covers industrial development. In the initial stage of industrial development, the focus is on developing industries to replace imports and consumer goods production.

In the subsequent stage, there is a shift from import substitution to export promotion, from labor-intensive to capital and technology-intensive industries, and from light to heavy and petrochemical industries in that order. In the early stages, the emphasis is on promoting textiles and basic consumer electronics. These are later replaced by the steel industry. This transition is the result of planning and budgeting by the Economic Planning Board (EPB), which has developed plans focused on target industries. These plans are then detailed and incorporated into the country's five-year economic development plan, with the main objectives being:

1. Establishing government investment policies and support.
2. Stimulating private sector investment in the target industries.

Stage 2

In this step, large companies and industrial groups were established through close collaboration between the government and the private sector. This resulted from the initial stages where the private sector understood the direction of industrial development that the government aimed to promote and adjust investment plans for these industries. It can be said that large and long-term investments are difficult to materialize without government support and policy consistency, which are crucial factors for long-term private sector investments.

Given these reasons, it remains a vital issue to foster cooperation between the public and private sectors, which continues to be a critical factor in economic development.

This fact is at the core of the industrial policies of many East Asian countries, especially Japan and South Korea. It also highlights the creation of mechanisms for long-term economic planning and expansion by the government. In this step, the government actively participated in the establishment of large companies, fundraising plans, industry group preparation, and market protection for these companies. Furthermore, for large organizations and industrial cluster groups, the government also employed legal processes to define directions and support target industries.

The South Korean government has enacted laws to support various industries, including examples such as:

- The Machinery Industry Promotion Act (1967)
- The Shipbuilding Industry Promotion Act (1967)

- The Temporary Measure for Textile Industry Facility (1967)
- The Electronics Industry Promotion Act (1969)
- The Petrochemical Industry Promotion Act (1970)
- The Steel Industry Fostering Act (1970)
- The Nonferrous Metal Smelting Act (1971)
- The Textile Industry Promotion Act (1979).

Laws have been established to regulate participation in industrial commodity markets, with committees responsible for considering and monitoring government policies, setting up research and development institutions, and forming business associations specific to particular industries.

The committees responsible for policy consideration typically consist of government officials with expertise in the respective private sector and representatives from the business sector. Policies are generally formulated by these committees through close negotiation and deliberation between government and private sector representatives.

However, to avoid excessive competition among local companies in small-scale markets, the government has reserved the right to enter each target industry. For example, car manufacturing factories like Hyundai Motors and Kia Motors were established with authorization from the Ministry of Industry and Trade under the Automotive Industry Promotion Act.

Another significant challenge is securing initial capital for starting and promoting industries, which often require substantial, long-term investments that the private sector cannot entirely undertake. This issue remains a critical concern in economic development.

To address these issues, the government plays a pivotal role in providing loan guarantees for foreign loans taken by domestic companies in these industries. Simultaneously, it precisely determines its favored industries, thus enabling private companies to swiftly enter these markets with government policy and financial support. This approach has proven more effective than other promotion methods, which might hinder private sector investment in new industries.

Furthermore, concerns about sourcing capital from within the country may ultimately limit investment. This issue has led to the establishment of the Korea Development Bank (KDB) by the government to provide long-term financial support for industrial development. The government is also keen on attracting substantial

foreign capital to supplement its efforts, though foreign investors have been somewhat hesitant due to the high risks and uncertainties present in South Korea.

In response to these challenges, the government serves as a guarantor for foreign loans taken by companies within the country. Simultaneously, the government's clear direction-setting, specifying target industries for its support, allows private companies to swiftly enter markets with government policies and financial backing. This approach has proven more effective than other promotional methods, which may hinder private sector investment in new industries. Nevertheless, foreign investments have started to flow into the country.

The government takes a determined stance in selecting industries for investment in the country, focusing on the transfer of technology in new industries. Additionally, under the government's policy, companies like Hyundai Motors, Hyundai Heavy Industry, and Samsung Electronics have been able to grow rapidly. Clearly, beyond financial and legal support, South Korean companies receive government backing through the establishment of industry cluster groups and other related initiatives.

The development plan is adequately supported by legal measures and the creation of government organizations for management and coordination with industry cluster groups. Furthermore, the domestic market is protected through import taxes and other restrictions, with the aim of helping newly emerging companies in the market compete with international automobile companies in both price and quality.

When the government established policies limiting car imports from foreign countries, it created a specialized agency for controlling special import taxes. Additionally, South Korean companies often employ a pricing strategy at lower levels to gain advantages when entering foreign markets. In such cases, entrepreneurs receive support in offsetting price differentials to sell at prices below their production costs. Moreover, there have been considerable efforts to protect exports, not only to establish new industries but also to ensure the continued production of entrepreneurs when facing intense competition in foreign markets.

Stage 3

At this stage, it involves supporting and developing strategies for medium-sized and small-sized enterprises (SMEs). This is a result of Phase 2, which marks the beginning of each target industry establishing its supply chain. Take the

automobile industry, for example, where a single car typically consists of 20,000-30,000 components, all of which must adhere to the same standards to ensure the efficient functioning of the vehicle. Therefore, in the automobile industry, the quality of components produced by SMEs is the most critical variable in determining the competitiveness of each company. Setting up large companies is often easier compared to developing SMEs.

When compared to other countries, many companies or industries are often established through the inflow of foreign capital and technology, lacking domestic technological capabilities. However, in the case of South Korea, the establishment of large companies, as presented in Phase 2, creates a ripple effect by generating opportunities and markets for medium-sized and small-sized enterprises (SMEs). This is a consequence of the aforementioned policies, resulting in the proliferation of related industries and encouraging more domestic entrepreneurs. Additionally, the growth of both large organizations and SMEs leads to increased employment, particularly skilled and technical labor.

Stage 4

Driving the nation's technological workforce and fostering the development of science and technology can be likened to the growth of infants. Just as infants require proper care and adequate nutrition to grow into capable and efficient adults, establishing targeted industries and industrial clusters is not the sole driver of overall economic growth.

Another crucial factor is whether these industries have the capacity to compete and support operations at the next level. The creation of labor standards and the promotion of skill development are vital factors that elevate competitiveness, along with the synchronized development of technology. This becomes the government's fourth policy in South Korea, emphasizing human resource development.

The government-initiated projects to train and procure skilled technical workers to address labor shortages in technology-driven industries. In this Phase 4, systematic efforts and continuous collaboration between the government and private sector have led to consistent industrial development, making South Korea a global hub for industries and technology.

3.7 The Birth of Steel Industry in Korea

For South Korea in its early stages of industrial development, the steel industry can be compared to the importance of water in the oasis. The demand for steel continued to rise steadily due to construction projects and the expansion of industrial development throughout the 1960s. However, the domestic demand for steel in the country reached 116,000 metric tons in 1961. Most of it was produced through the process of melting scrap steel in small electric arc furnaces. When compared to North Korea's steel production during that period, which had the capacity to produce 1 million metric tons of steel, South Korea faced challenges in terms of steel production. These challenges were primarily due to the lack of basic conditions favoring the development of the steel and iron industry in South Korea, attributed to both economies of scale and the difficulties in obtaining iron ore as the primary raw material.

During this time, South Korea faced a shortage of large-scale iron ore resources within the country. Furthermore, there was a scarcity of the necessary technology and capital for constructing and maintaining integrated iron and steel plants. Therefore, the overall conditions in the country made it impossible to establish integrated steel plants.

In consideration of the global average production capacity required per year for steel mills, which was at 3 million metric tons, economies of scale played a significant role. These factors explain why industrial development was limited during that era. Development primarily occurred in leading countries such as the United States, Japan, Germany, and the United Kingdom, as well as in other nations with the capability to produce steel at an industrial level.

Negotiations for obtaining foreign loans posed significant challenges, raising serious questions about the feasibility of the entire project. President Park, therefore, removed Prime Minister Ki-young from his position, holding him responsible for the delays in securing funding. Park Chung-hee, the President, appointed Park Chung-hoon as the new Minister of Trade and Industry.

However, there was no immediate progress even with the change in personnel because the new Prime Minister embarked on visits to the United States and West Germany to persuade their banks to participate in providing loans for the country's steel mill project. Nevertheless, these efforts did not bear fruit, and the requests were rejected. Despite the lack of progress in negotiations with potential lenders, KISA

(Korea Iron and Steel Association) called on the government to make agreements with technology licensors to proceed with operations during the initial years.

During this period, economic observers in South Korea following the situation released a report, suggesting that South Korea's steel mill project was not economically viable. In this report, they referenced and attached significance to case studies of developing countries that faced failures in their steel mill ventures. The report highlighted that several developing countries, including India, Turkey, Mexico, and Brazil, had invested in large-scale projects with similar characteristics during the early 1960s. However, they encountered various issues related to funding and technology for their operations, as well as size-related challenges.

When compared to other developing countries, South Korea's steel mill project faced more challenges, both in terms of the size of the domestic market and available resources. It was not surprising, given these circumstances, that the project failed to attract foreign capital. President Park emphasized that "We must build the steel mill no matter what happens." However, due to increasing pressure, President Park eventually abandoned the steel mill plan. Newspapers called on the editorial board, suggesting that the country should opt for steel imports rather than pushing for domestic production.

With mounting pressure, President Park appointed Kim Haksul as the new Prime Minister, tasking him with overseeing the creation of a state-owned steel company, POSCO. In his first official act as Prime Minister, Kim Haksul wrote on his blackboard, "Construction of integrated steelworks," and informed his secretary that it could be erased only when he left his office or when the construction of the steel mill was completed.

After nearly failing in all previous efforts, the last resort was to negotiate the conditions of an agreement with Japan regarding a fund that would compensate South Korea under the Japanese-style administration of South Korea. The fund project proceeded based on an official agreement between the two governments.

In this regard, since the mentioned fund served as compensation for Japan's administration of South Korea, there was a provision that the funds could not be used for investment in the steel industry project. Generally, government officials and the public believed that these funds should be used to improve the quality of life for all South Koreans since they had suffered under Japan's colonial rule in one way or another.

With a strong determination to build a steel mill for the first time, President Park ordered the suspension of the original expenditure plan from the compensation funds and called for a new negotiation. His goal was to use some of the funds for investment in the steel mill project. Convincing the Japanese government to accept changes to the previously agreed-upon proposal required significant effort.

Subsequently, a new agreement was signed on December 3, 1969, marking the beginning of the establishment of the Pohang Iron and Steel Company (POSCO). In reality, South Korea owed gratitude to Yoshihiro Inayama, the President of Nippon Steel, for the success of the negotiation. He provided support for the steel mill project, including facing opposition from China, which had proclaimed the Zhou Enlai Doctrine in May 1969, prohibiting Japanese companies doing business with Taiwan and South Korea from entering the Chinese market.

In this regard, President Park set the steel production capacity at 1 million tons, which was lower than the previously mentioned international standard production capacity. To kickstart the project, an additional 23 billion won had to be injected from the United States' funds into the project, apart from the investments. Additionally, 30.8 million dollars from the compensation funds for the administration of South Korea under Japan's rule were used. Furthermore, the government continued to allocate short-term loans from the Japanese government of 42.9 million dollars and another 50 million dollars in commercial loans from Japanese banks to fill the remaining funding needs.

Another measure the government took to help make POSCO more cost-effective and efficient was to take on the burden of raising capital for related infrastructure construction. It allowed POSCO to convert loans from state institutions and banks into shares, ensuring financial flexibility without the need for immediate cash to repay loans in installments. It also suspended dividend payments (major shareholders included the Korean government, the Development Bank of Korea, commercial banks, and Tongyang Steel of Korea).

Obtaining funding to support POSCO's operations was already a significant challenge. Operating a steel production venture was no less challenging. None of the 30 founding members of POSCO had any background in the steel industry. Members who participated in initiating the steel industry likened their work to being on the front lines, requiring sacrifices for the nation.

As a result of their determination, the steel industry project was successful. POSCO swiftly constructed 22 large-scale steel mills at the lowest possible cost.

Additionally, POSCO had to reclaim the sea in an area covering a total of 8.26 million square meters, reclaiming 700 square meters of sea each day.

During the construction of the steel mills, POSCO implemented a business strategy of importing intermediate steel to produce the final steel product. They initially built metal sheet processing plants before constructing steel mills and other types of plants. Using this strategy, POSCO was able to generate profits from the sale of final steel products to support the construction of other types of plants at the early stages.

With strong support from President Park Chunghee and the dedication of its founding chairman, Park Taejoon, POSCO grew to become a global steel producer. President Park Chunghee also shielded POSCO from various influential groups. At the time, the prevailing unofficial practice in South Korea's political landscape was to distribute a portion of foreign loans procured by the government to political parties and political leaders. Recognizing the problem and the pitfalls of this practice, President Park Chunghee ordered Chairman Park Taejoon not to yield to political pressure and to report such issues directly to the president.

The company POSCO made the decision to build an integrated iron and steel plant, the second of its kind, in Kwangyang Bay. To accomplish this, POSCO had to rely on technical knowledge from Japan's steel industry, which initially hesitated to assist POSCO due to concerns that South Korean steel companies might enter the Japanese steel market. However, Yoshihiro Inayama, the Chairman of Nippon Steel, played a crucial role in persuading Japanese steel industry companies to provide technical assistance to POSCO. Several Japanese steel companies decided to help POSCO, particularly in the construction of the steel mills, instead of competing with the South Korean construction companies.

The steel production capacity at Pohang and Kwangyang reached a significant 41.43 million tons in 2014, making South Korea the world's fifth-largest steel producer, following China, Japan, the United States, and India.

Dr. John P. W. Jaffe described POSCO's success as follows: "South Korea started producing steel from scratch, although studies concluded that the results were not cost-effective." POSCO's success can be considered a remarkable achievement. The company's integrated iron and steel production played a pivotal role in the efficient development of South Korea's industrial sector.

Looking back, it is clear that without the policy to initiate steel production in its early stages, South Korea's current level of economic development would lag behind Taiwan and China significantly, and the possibility of constructing steel production facilities would be much less likely.

3.8 The Development of Petrochemical Industry in South Korea

The petrochemical industry comprises the naphtha-cracking process and 12 other related sectors. Without an efficient petrochemical industry, the country would be unable to make its light industry independent from foreign suppliers and could not guarantee the competitiveness of products within the industry.

South Korea's first oil refinery, known as the Korea Oil Refinery Corporation, was established in 1962 in the Ulsan Industrial District through a 50-50 joint venture with Gulf Corporation. However, by the early 1960s, the country had to import all of its petroleum and allocate shares anew to control scarcity. In 1965, the most suitable production capacity for the naphtha-cracking process to produce ethylene was determined to be 300,000 tons per year. At that time, Japan was expanding its petrochemical facilities to meet global standards, while South Korea lacked both the capital and technology to begin. Additionally, South Korea faced a severe issue – the gap between domestic demand and required production capacity was too significant. The maximum production capacity achievable within South Korea's petrochemical industry at the time was not more than 30,000 tons per year.

In February 1966, the Ministry of Trade and Industry (MTI) commissioned a U.S.-based consulting company, Arthur D. Little, to study the potential for the petrochemical industry in South Korea. MTI believed that a study conducted by internationally renowned consultants would attract the interest of foreign investors. However, the results were disappointing. The consulting report, published in September 1966, concluded that, to ensure the survival of the industry, South Korea's annual production capacity should not exceed 30,000 tons due to extremely low domestic demand.

In that case, how can a factory with an annual production capacity of 30,000 tons compete with foreign counterparts? Therefore, the Ministry made a decision that the Naphtha-cracking plant must have a minimum annual production capacity of 66,000 tons of Ethylene. This project was then elevated to a significant project in the Second Economic Development Plan (1967-1971). Subsequently, companies receiving state funding for managing within the petrochemical industry were established according to this objective.

Key measures used by the government to ensure that the prices of petrochemical products in the country remained lower than imports included tax exemptions for imported equipment and materials used in petrochemical plants. New petrochemical companies were granted exemptions from corporate tax, business tax, and other related taxes for five years. Moreover, the Foreign Capital Mobilization Act was amended to exempt taxes for direct foreign investment in the petrochemical industry.

To support the petrochemical industry, land buyers for petrochemical plant construction could make a down payment of only 20% of the land sale price and pay the remaining amount in installments over the next five years after a two-year grace period. Additionally, even though at the time, the equity capital rate was set at 30% of the total asset value of the investment, the government allowed foreign cash loans as special capital to match the ownership ratio and help keep the price of the final products low. The government subsidized all public utilities, including electricity and water, to keep prices low.

After construction had been underway for a while, there was a need to adjust production capacity to meet the increasing demand. In the end, in 1972, the Petrochemical Complex grew in scale, with a production capacity of 100,000 tons per year in the Ulsan region. However, the government's predictions were not entirely accurate because of the rapidly changing demand for petrochemical products. Despite these challenges, the development efforts of the Ulsan complex contributed to the economic growth and increased exports of South Korea. By the early 1980s, due to the continuous development efforts, the petrochemical industry helped generate over \$10 billion in annual exports by the year 1980.

The government remained committed to expanding the petrochemical industry continuously. Consequently, the Ulsan Industrial Complex was expanded, and a new industrial complex was established in Yeosu. The government aimed to build two Naphtha-cracking plants, each with a production capacity of 300,000 tons of Ethylene. However, these plans had to be adjusted to a single plant with a production capacity of 350,000 tons after the first global oil crisis. Additionally, there were issues with fundraising and equity capital, causing construction to be delayed until November 1975. The new Yeosu complex was completed by the end of 1979, which was later than the original plan.

The determination to develop and expand production capacity led to an increase in Ethylene production to 505,000 tons per year from within the Yeosu complex. South Korea became a major petrochemical producer, ranking 15th globally in 1981.

In 1987, another Naphtha-cracking plant was built in the Yecheon complex with a production capacity of 350,000 tons per year.

When the petrochemical industry had reached its full potential, the laws governing its development, which were enacted to control market entry, were abolished in June 1986. This change allowed for unrestricted investment in the petrochemical industry.

3.9 The Development of Machinery and Automobile Industry in Korea

With the belief that the production of automotive components is a crucial foundation for the development of the automotive industry, the South Korean Ministry of Trade and Industry formulated a plan for the development of the automotive industry in 1964. The plan aimed to encourage domestic car manufacturers to use locally produced automotive components in their production processes. However, this plan was not particularly effective. Additionally, the policy for developing the automotive industry lacked continuity.

Subsequently, companies such as Shinjin Automobile, Asia Motors, and Hyundai Motors were established and operated under the influence of political groups for many years. During this period, there was an increase in the importation of automotive components, which contradicted the government's policy of promoting the production of automotive components within the country.

For automobile manufacturers, the process of producing automotive components domestically began in October 1968. The Ministry of Trade and Industry announced a 5-year industrial development plan and a plan for producing automotive components within the country in 1969. The details of this plan included

Step 1 the automotive industry development plan began with the goal of increasing the utilization rate of domestically produced automotive components. The objectives were as follows:

- Personal vehicles must use domestically produced automotive components exclusively by 1972.
- Public transportation vehicles and trucks must use domestically produced automotive components exclusively by 1974.

Step 2 separating automobile manufacturing companies from component manufacturing companies

Step 3 assigning each factory to produce only specific automotive components, allowing the factories to specialize in the production of each component.

Step 4 reduce the number of car models from 26 models to fewer than 19 models.

These policies are considered revolutionary for the Korean automotive industry.

The mentioned policy had a significant impact on automobile and automotive component manufacturers, particularly in the case of Hyundai. The objective was not only to produce domestic automotive components but also to develop Korean-made cars. This policy directly affected Hyundai, which at the time was a contract manufacturer for Ford, an American automobile company.

Ford emphasized that it would not allow the use of the Ford Cortina model name if Hyundai assembled Ford cars using domestically produced components. This created substantial pressure on Hyundai and other automobile manufacturers.

In February 1970 the Ministry of Trade and Industry announced the "Automobile Engine Construction Plan," with Minister of Trade and Industry O Won-chol leading the initiative. This plan was designed to ensure that only one automobile manufacturer would be responsible for casting components and assembling engines. This policy placed significant pressure on all three automobile manufacturers: Shinjin, Hyundai, and Asia. Initially, Shinjin partnered with Toyota, while Hyundai collaborated with Ford. However, the alliance between Shinjin and Toyota was short-lived as Toyota withdrew from the collaboration.

Hyundai faced similar challenges when Ford canceled its investment plans with Hyundai. The negotiations for the equity-sharing agreement were canceled, and there was a risk of being blacklisted under the Four Tzu principles, which stipulated that foreign businesses doing business with either Korea or Taiwan could not do business in China.

Kia Motors became an engine manufacturer in November 1970. During the period when Shinjin and Hyundai faced ownership issues, Kia Motors began producing 2,000cc engines in 1973 and assembled the "Brisa" personal car model in October 1974.

After facing unexpected ownership challenges, Shinjin partnered with General Motors (GM) to build a large automobile manufacturing plant with an

annual production capacity of 50,000 vehicles. This partnership operated under a 50-50 venture agreement.

The three South Korean automobile manufacturers - Shinjin, Hyundai, and Asia - experienced constant changes in their fortunes. The equity sharing between Shinjin and GM failed due to differences in benefit sharing between the two companies, and GM's assets were eventually acquired by Daewoo.

To enhance the efficiency of machinery and automotive parts production, the government supported the establishment of the Changwon Integrated Machinery Industrial Complex in 1973. This complex covered an area of 33 million square meters and became the location of 88 machinery production plants by 1977. The Changwon Industrial Complex contributed to the significant growth of the Korean automobile industry, making it one of the world's top 5.

Several other countries also attempted to develop their own automobile industries during the same period as South Korea. However, many of these efforts failed due to various challenges.

In the case of Taiwan, there was resistance from the media and the legislature, which made it difficult to follow the South Korean model. Consequently, Taiwan chose to become an automobile-assembling nation by importing parts from different countries.

The Philippines also initiated the development of its automobile industry, allowing up to nine companies to establish car assembly plants. However, they faced public opposition, and these efforts ultimately ended in failure.

3.10 The Development of Korea's Electronics and IT Industries

President Park Chunghee sent a New Year's message in January 1967, stating that the government aimed to achieve the goal of exporting electronic equipment worth \$1 million within that year. Additionally, the government set a target to achieve a value of \$100 million within the decade of 1970. The Ministry of Trade and Industry was tasked with driving the country forward in the field of electronics and had a clear vision.

President Park was highly determined and sought to deepen his understanding of the electronics industry. He received knowledge and advice from foreign scholars and experts. Notably, Dr. Kim Wan-hee from Columbia University, a Korean-American scientist and leader in Japanese business, was among those involved.

In the initial stages of developing the electronics industry following President Park's direction, junior officials within the ministry drafted a plan to expand electronic equipment exports to reach \$100 million by the end of the Second Five-Year Economic Development Plan (1967-1971). However, their proposal was initially rejected by the director responsible, who believed it was overly ambitious. Despite this setback, the officials remained confident that they could achieve the goal and eventually submitted the plan directly to the responsible minister, receiving approval in the end.

One year before developing the electronics industry, the government established the Korea Institute of Science and Technology (KIST) and appointed Dr. Choi Hyung-sup as its head. Dr. Choi played a crucial role in shaping the government's policies in the fields of science and technology and coordinated a meeting between President Park Chunghee and Dr. Kim Wan-hee to seek advice. Dr. Kim submitted a report titled "Promoting the Electronics Industry in Korea" to President Park in September 1967.

Dr. Kim's proposal focused on three key measures to be implemented:

1. Enactment of legislation to promote the electronics industry.
2. Establishment of a fund to promote the electronics industry.
3. Creation of specialized agencies or units with specific missions to promote the electronics industry.

One year before embarking on the development of the electronics industry, President Park allocated \$100,000 for further research. The government then proceeded with the development of the electronics industry in the country.

To kickstart the development of the electronics industry, the Enactment of Legislation to Promote the Electronics Industry was announced as law in December 1968. Subsequently, the government introduced the Electronics Industry Policy Committee and began pushing forward policies to promote the electronics industry.

Furthermore, government officials, along with business leaders, were sent to the United States, Japan, and Taiwan to study and gain insights into the electronics industry. This was done under the guidance of President Park.

Following President Park's directives in June 1969, the Ministry of Trade and Industry (MTI) selected 95 electronic products for domestic production development. It was determined that 62 of these products should be produced within 3 years, with the remaining to be completed within 5 years. Additionally, MTI

identified interested companies for development and applied for government support.

In addition to product development, MTI set annual export targets, aiming for a value of \$42 million in 1969 (comprising \$8 million from finished products and \$34 million from components). This export value was projected to increase to over \$400 million by 1976 (\$160 million from finished products and \$240 million from components).

Furthermore, the government was determined to provide unrestricted government support for projects aimed at expanding the export of electronic equipment as outlined in the plan. However, the development plan faced some minor setbacks. The selection of companies for development, consisting of 29 component manufacturers, was delayed by 1.5 years. To expedite the process, the Deputy Minister of Mines, Industry, and Electricity took swift action to identify the companies that would develop electronic components, ensuring completion by 1971.

The results of government support led to a rapid increase in the export of electronic products. In 1976, electronic product exports exceeded the target with a value of over \$400 million. Ultimately, South Korea achieved export figures of up to \$1.1 billion.

One crucial strategy employed by the South Korean government in the development of the electronics industry was the establishment of industrial clusters for the production of electronic components and finished products. This included the creation of large-scale electronic centers in Gumi in 1971. However, these efforts were insufficient for South Korean electronics companies, which still heavily relied on technology imports and imported components.

To address this issue, the government concluded that it was necessary to encourage direct investment from foreign companies. Japanese component manufacturers, primarily SMEs, were at the forefront of global electronic product manufacturing at the time. The main challenge was that Japanese companies were reluctant to invest in South Korea.

To incentivize foreign investment in South Korea, the government established the Complex Electronics Industry Centers in Guro and Seoul to attract component manufacturers from Japan, in particular. Yoo Changsoon was appointed as the head of the Complex Electronics Industry Centers, and he later became the Prime Minister.

To kickstart the electronics industry, the government provided support to encourage Korean-Japanese businessmen to reinvest in South Korea, along with Japanese SMEs. These measures aimed to underscore the significance of foreign direct investment and to facilitate advanced technology transfer for South Korean companies.

In an effort to garner public interest in the electronics industry and facilitate information exchange among electronics companies, the government annually supported the Korea Electronics exhibition. The first exhibition took place over eight days in October 1969. President Park attended these exhibitions every year until his passing in 1979.

During the early stages of the electronics industry, only a handful of South Korean companies seized the business opportunities presented. One of these pioneering companies was Goldstar, which later became LG. Goldstar began its journey in November 1959 by manufacturing radios, marking the first time in South Korea. The price of a radio set for broadcasting was set at 20,000 won, approximately three times the starting monthly wage for university graduates.

Subsequently, the company entered the fan market and eventually progressed to produce black-and-white televisions in 1966. These televisions were priced at four times the starting monthly wage for college graduates, but demand could not be met, even with the high prices.

Subsequently, another leading company in the Korean electronics industry emerged, Samsung, which began its journey by forming a partnership with Japan's Sanyo in March 1969. However, Samsung soon notified the government that relying solely on Japanese technology for television production would have long-term adverse effects on South Korea's entire electronics industry. Consequently, the government approved the establishment of a new joint venture under the condition that all products be exported. This led to the formation of Samsung-NEC in 1970.

As a result of these promotion efforts, South Korean companies, which had gained technology from partnerships with major Japanese electronics giants and foreign direct investment from Japanese component manufacturers, entered niche markets. They began producing lower-tier products that Japanese household appliance manufacturers were no longer interested in. Subsequently, these South Korean companies were able to bridge the technology gap with Japanese companies and produce high-end products.

In the case of television production, Anam Electronics, a joint venture with Japan's Matsushita Electric, manufactured color televisions in 1974, marking the first instance in South Korea. Shortly thereafter, Samsung Electronics also began producing color televisions using its own technology. However, no South Korean company was able to sell color televisions domestically due to a ban on broadcasting color televisions within the country. President Park had issued this ban to prevent unnecessary consumer spending and class conflict. It was only after a new military government took power in December 1979 that the ban was lifted in 1980 to support the development of the electronics industry, leading to the commencement of color television broadcasting.

These electronics industries received support from KIST and research institutions funded by various government programs. The government's strategy aimed to reduce the technology gap between South Korea and technologically advanced countries. To achieve this, the South Korean government repatriated a significant number of Korean scientists working in foreign research institutions. These scientists received high compensation and various incentives to work diligently on research, contributing to the development of crucial technologies for Korean companies. They often collaborated with engineers from other organizations in technology development projects, despite the challenges and sacrifices involved, including some fatalities.

A turning point in electronic technology development occurred when Lee Byungchull, the chairman of Samsung Electronics, made a significant decision to invest in semiconductor production in 1983. Some of Samsung's executives initially opposed Lee's investment proposal, arguing that it was impossible for Samsung to produce semiconductors of similar or higher quality than those made by Japanese companies. At that time, Samsung's capabilities were far from competing internationally in the color television market.

However, Lee's determination and decision ultimately led Samsung to become the world's largest manufacturer of memory chips. Samsung transformed itself into a major player in the semiconductor industry and expanded into manufacturing smartphones, home appliances, and other technologically advanced products worldwide. This decision propelled Samsung to a leadership position in South Korea's electronics industry, surpassing its competitors like LG.

Not only Samsung but also other South Korean companies had continuous growth in the global market. LG and other South Korean companies had a significant share in the global market for electronics and technology-intensive products. When

considering the history of Samsung's semiconductor industry, it serves as a good case study for entrepreneurs.

In the early stages, Lee set a goal for Samsung to develop the first 64K DRAM, a product originally produced only in the United States (even Japanese companies had a negative view that it might take Samsung more than 20 years to achieve this). However, Lee's direction led Samsung to success in developing this technology in just six months, followed by the development of 256K DRAM, 64K SDRAM, 1M DRAM, and 256K SDRAM, all within the period of 1984-1986.

This success made South Korea a leader in semiconductor chip production worldwide, on par with the United States and Japan. Later, South Korean company Hynix also entered the semiconductor chip market by developing 64K DRAM in 1992, with support from KAIST, a prominent research and education institution in science and technology. Additionally, one in four KAIST graduates became crucial assets in Samsung's technology development, contributing to Samsung's product innovation.

Due to their dedication to development and determination to foster innovation domestically, in 2013, South Korea became the second-largest player in the global semiconductor market, surpassing Japan in this industry. However, both Samsung and Hynix had to face intense competition and respond to challenges from Japanese and American manufacturers, including legal disputes over market manipulation.

By 2015, South Korea had a dominant market share, holding approximately 75% of the DRAM market and around 33.6% of the television market, making it the leader in these industries. The major player in the South Korean IT sector was Samsung Electronics, which started in 1986 as a joint venture with Japanese companies, relying entirely on Japanese technology. However, Samsung Electronics has since surpassed Sony, the symbol of Japanese electronics technology, in terms of market value and sales volume in 2002 and 2004, respectively. Furthermore, Samsung's business value exceeded that of American company Hewlett-Packard and German company Siemens, eventually making it the leading IT manufacturer in 2009. In the global smartphone market, from 2011 until today, Samsung has held the top position, followed by Apple at number two. Additionally, when considering the second quarter of 2017, Samsung outperformed Apple and became the global leader in terms of sales volume, operational profit, and profit margins in the manufacturing industry.

Many countries that are currently in the process of development are impressed by South Korea's outstanding potential in the IT industry and may want to follow the path South Korea has taken to promote these industries. The key to South Korea's success in the IT industry is that the government has a vision for the IT sector and takes the lead in investing in IT infrastructure. Subsequently, they nurture fledgling businesses and organizations, much like parents care for their children, and drive national efforts to promote skilled technical labor and workforce development.

Given their initial state of underdevelopment in the field of science and technology, South Korea's government began investing in research. They provided substantial support to scientists returning from developed countries and offered them competitive salaries, which attracted top talent. Additionally, in the face of fierce global market competition, South Korean entrepreneurs went all out to develop products to survive and sought partnerships or technology transfers from foreign companies. In South Korea's case, the government played a significant role in industrial development. Their historical development trajectory highlights the importance of long-term collaboration in the continuous development of the IT and high-tech industries, showing that there are no shortcuts or quick fixes; rather, it takes decades of continuous effort and investment.

Summary

The content presented in this section demonstrates a systematic approach to industrial development and a commitment to the development of South Korea's economy. This involves collaborative efforts between the government, which sets industry goals, and the private sector, which benefits from government support to conduct business in line with the government's objectives. South Korea's success has reaffirmed the previous conclusion that there is no need to choose between centrally planned systems (as seen in socialist countries) or allowing the market to operate freely without government intervention (as seen in market-oriented countries like the United States). Instead, a combination of both systems has been employed in both Japan and South Korea, highlighting the determination to set target industries and utilize government support measures. Subsequently, the private sector takes the lead in seeking profits and emphasizing exports. This has led to the creation of competitive advantages on the international stage and an increase in the average income of the population in these countries. It has also changed the traditional concept of economic development, which previously relied on a free-market system

or gradually transitioning to government-stimulated growth of GDP at a rate of 8-10 percent per year.

In addition to setting goals at the regional and sectoral levels, South Korea's industrial policy also demonstrates an understanding of business strategy. In the case of the steel and petrochemical industries, the government was aware of the significant disadvantage in terms of economies of scale due to lower production capacity compared to international levels. The government, therefore, made efforts to use every measure to reduce costs to offset these disadvantages until they achieved success.

However, in the case of the automotive and electronics industries, the government changed its strategy to create a network of domestic component manufacturers to compete internationally. This also included developing their own technology through research conducted by institutions like KIST, which led to long-term international success. Currently, leading South Korean electronics companies such as Samsung have larger business sizes and sales figures compared to global manufacturers like Sony, Siemens, Hewlett-Packard, and Apple. They are also among the companies with the most patent applications filed worldwide each year.

The success of South Korea has changed the conventional thinking about economic development that was previously tied to the belief in a free market system or gradual growth according to economic growth theories. South Korea's growth has demonstrated that a country can elevate itself from being one of the poorest in the world to a high-income nation with technological advancements within a single generation. This suggests that a nation's income level doesn't necessarily have to follow the path laid out by economic growth theories, which show growth occurring through normal economic mechanisms (organic growth). Instead, it can involve government intervention and manipulation of certain aspects of the economy to stimulate rapid development (inorganic growth) and raise national income levels quickly.

References

- Han, Y.S. (2016). *Miracle from the Rhein to the Han River: Heavy industrialization of South Korea and its social consequences under Park Chung Hee*. Unpublished Ph.D. Dissertation. Lancaster University.
- Chun, S.H. (2018). *The Economic Development of South Korea: From Poverty to a Modern Industrial State*. London: Routledge.