

From Potato Chips to Computer Chips: Features of Korea's Economic Development

**Knowledge Sharing Forum on
Development Experiences:
Comparative Experiences of Korea
and Latin America and the Caribbean**

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**Knowledge and Learning
Sector**

**DISCUSSION
PAPER N°
IDB-DP-386**

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June 2015



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Chapter 1

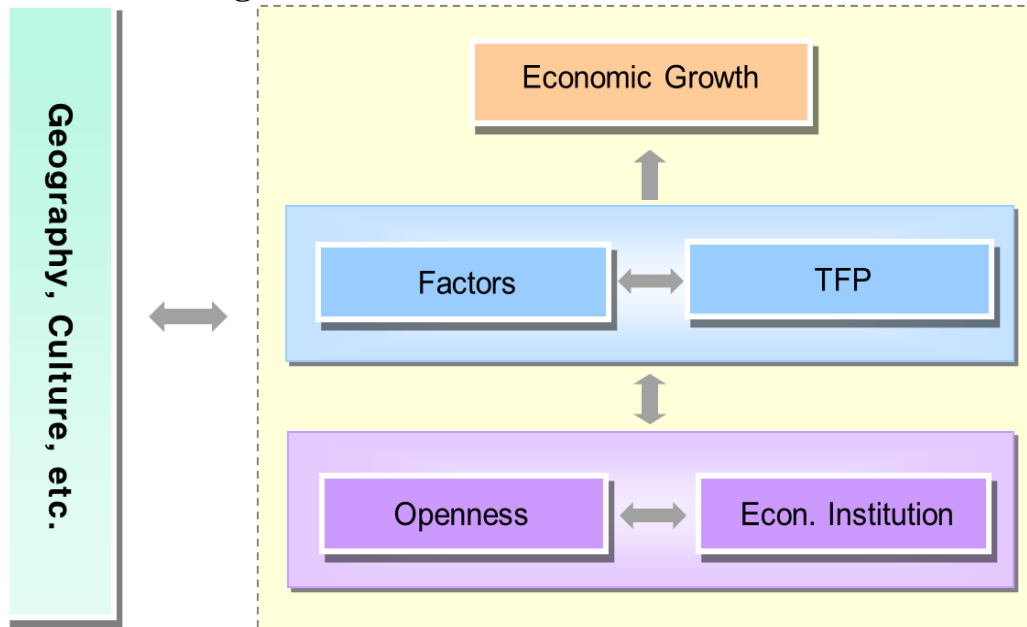
Executive Summary

When considering countries of phenomenal economic development and growth, Korea is among the top tiers. While there are other economies with similar economic growth, including those of Singapore, Hong Kong, and Taiwan, the economic growth of Korea is exceptional considering that the country lacked basic economic foundation in the past. R. Lucas Jr. (1993), a Nobel Laureate in economics and also a renowned scholar of the respective field, praised the country's economic success, by stating that "I do not think it is in any way an exaggeration to refer to this continuing transformation of Korean society as a miracle. As an evidence for his argument, he asserted "Never before have the lives of so many people undergone so rapid an improvement over so long a period, nor is there any sign that this progress is near its end."

Yet, the history of Korea is more than just its outcome; it is the history of continuous national ordeal, a series of challenges and crisis that required people to toil night and day to overcome the situation. If it were not for today's splendid economic success, it would have been more appropriate to describe the history of Korea as that of wretchedness and misery. The fact that South Korea became one of the leading nations in the world is nothing less than a miracle, considering that it underwent many hardships after its independence such as fratricidal Korean War, a long period of dictatorship, 4.19 revolution as a reactionary to the dictatorship, 5.16 military coup, the engagement in the Vietnam War, two oil crises, another military coup afterwards, civil revolutions, a foreign exchange crisis, and the global economic crisis.

Economic growth means value-added increase in a certain period of time. To boost this value-added increase, the elements of production such as labor, capital, and land must be both accumulated and invested. Furthermore, it requires the effective use of these elements by combining them when necessary, so that the best value can be drawn out. In other words, the vital factor in economic growth is raising productivity.

Figure 1 Determinants of Economic Growth



Source: KDI (2005).

Then, given similar situations, how come some countries show different performance in factor accumulation or productivity improvement? The accumulation of resources and increase of productivity depend on economic incentive. Proper institution in an economy that provides incentives for economic agents enables factors to flow and to be accumulated where productivity is high. It also gives motivation for innovation and improvement of productivity. Competition in product markets and acquisition of resources and raw materials with low cost through an open-door policy can induce the accumulation of elements and improvement of technology, where in a broader perspective, open-door policy can also be considered as a part of institution.

The growth of the Korean economy is unique since only a few economies could demonstrate compatibly high growth rates for a long period. However, at the same time, Korea's case is never unique as its success story is based on factor accumulation, productivity enhancement and, most of all, a fundamental called institution.

Its growth was possible due to the fact that there was a proper functioning of market backed by the establishment of proper institutions. The Korean government indeed worked favorably towards the establishment of institution and running of economy in a market-friendly manner. Some features of its growth pattern are worthwhile to be illustrated as there are still a large number

of developing countries and high income countries with unstable institutions worldwide, which could gain from a part of Korea's story, at least, and collect substantial knowledge for their future growth.

Chapter 2

Prior to Economic Arrival

Unlike its current status as a leading nation in the globe, Korea was one of the poorest nations only two generations ago. After its independence in 1945, South Korea suffered from: 1) the loss of the complementary economic relationship between the North and the South due to its division; 2) the leave of Japanese technicians, administrator and businessman, and therefore separation from the Japanese economy; and 3) extreme chaos after the hyper-inflation caused by monetary inflation over the independence period. The economic attempt that began right after the independence by the first republic ended up as a failure due to the Korean War (1950-53) that devastated every part of the country. Despite another attempt for economic reconstruction in 1953, when the armistice agreement was signed, it was not until 1960 that any signs of reconstruction were prominently displayed. However, it should not be misguided, as some scholars might falsely argue, since it is more appropriate to say that this period should be viewed as a preparatory time, which played a decisive role in enabling economic growth in the following period.

1. Establishment of the Private Property System

Some significantly important clauses which greatly facilitated the growth of Korea can be found in the first Constitution of the republic that was proclaimed in 1948. Especially, the clause that confirmed the establishment of private property right had a crucial influence on the elements that provided the foundation of today's economy, such as the accumulation of capital, mobilization of labor, and last but not the least important factor, the reinforcement of human capital. Such foundation was virtually established by the United States military government at the time. The military government tried to introduce a market economy to Korea. Despite the demand from both the right and left wing politics that the properties left by the Japanese in the country should be vested in the government, they decided to privatize by disposing those assets and transferred the ownership to some private businesses. In addition, the government won the people's approval by putting nested lands on sales and reforming agricultural policies.

Privatization continued even after the U.S. military government. Especially, transferring ownership most frequently occurred around 1951 to 1953. The first constitution of Korea stipulated that large-scale companies and mines should be either nationalized or state-owned enterprises.

Following the constitution, the government nationalized 50 enterprises in 1951; nonetheless, the governmental responsibility to protect citizens' private ownership of property was acknowledged and emphasized as well.

2. The Pursuit of Economic Growth and the Effective Use of Economic Aids

President Syngman Rhee's Administration advanced economic reconstruction through a series of developmental plans. It sought independent economic development by creating five comprehensive economic plans, beginning with the Five-year Industrial Resuscitation Plan in 1949 and continuing with the Economic Recovery Plan (1951), the Comprehensive Recovery Plan (1954), the Five-year Economic Revival Plan (1956), and the Three-year Economic Development Plan (1960). These kinds of plans had been widely practiced around the globe not only in communist countries but also in capitalist countries. With these plans, the government established the Planning Board (1948) and developed it into the Economic Revival Board (1955), and further into the Economy Planning Board (1961). These plans for economic reconstruction aimed primarily for the massive increase of social overhead capital, construction of basic industries such as the cement and steel industries, and improvement in productions of secondary industries.

The most important reason for the Rhee Administration's pursuit of economic reconstruction plan, which generated tremendous financial burden, was to build an independent economy. However, the Administration's policy goal was directly against the national interest of the United States. The U.S. tried to forge Japan as the central axis of East Asia in terms of economy and hoped South Korea and Taiwan to serve as the markets for manufactured goods produced by Japan. Accordingly, the U.S. urged for free market reformation, stabilization of currency value, and cooperation with Japan. Yet, to the Rhee Administration, the U.S. policy meant a new form of colonization and ominous resurrection of the Greater East Asia Co-Prosperty Sphere once pursued by Imperial Japan. President Rhee endeavored to dissuade the attempt of the U.S. by using Korea's geographical location as a strategic importance and also furnished import-substitution industry through the reconstruction plan.

The clashing opinions between the two countries were also exhibited in the issue of organizing aid goods. Around the reconstruction period, when Korea was to receive a massive assistance, the U.S. government insisted that Korea should primarily import consumer goods to achieve financial stability and improve public livelihood, while the Korean government insisted

importing capital goods and raw materials as its major goods. When referring to the International Cooperation Administration (ICA), the major foreign assistance operation of the U.S. government in the 1950s, one can understand that the position of the U.S. government was better reflected in the policy.

Nevertheless, the aid should be viewed positively in, at least, two respects. First of all, South Korea was in the dire need of assistance that would sustain the lives of citizens who were in a desperate situation after emancipation and successive war. The aids, without burdening Korea with the responsibility of repayment, provided for the very basic needs of Koreans at the time. If it had not been the case and therefore Korea had been obligated to repay the aids through domestic production, the accumulation of capital in the 1960s and 1970s would have been much more difficult. Secondly, the aid allowed the government to execute the comprehensive plan of the Six-year Human Resources Development Plan that aimed to provide universal elementary education to the people, which without it would have been impossible to attain virtual universal elementary education in 1957, at last. The economic growth through labor-intensive industry in the 1960s was possible because there was a plenty of young labor force that obtained elementary education in the 1950s.

3. The Achievement of Economic Policies in the 1950s

In the 1950s, the government maintained low exchange rate policy, controlled import activities, and at the same time, intervened in and controlled the finance. Furthermore, the government significantly limited the central bank's independent role of controlling currency. Such intervention created an economic rent in which the privileged agents of economic activity could acquire benefits only with their existing privilege, without any further efforts. Kim (1999) estimates the scale of economic rent up to 16-19% of GNP from 1955 to 1960, while the rent dependent upon regulation on foreign exchange is up to 11-15%, and the rent dependent upon regulation on funds up to 3-8%.

The central issue is whether such rent was for productivity use and to what extent. Choi (2005), holding a fairly positive view about the issue, argued that the distribution of economic rent played a stimulating role in the economic revival at the time. For instance, even with the massive destruction of the cotton industry during the Korean War, which amounted to 66% of the total, the excess of production capacity was resulted after 1956 with fast restoration process after the war (p.

370). Lee (2007) also argued that the government was consistent in allocating capital provided by the aids and loans from the UN Forces with some moral standards (p.306). He argues that the success was largely owed to the workings of incorrupt governmental officials who were educated in Japanese universities during the colonial era having hands-on experience in the financial institutions such as banks, and those who studied in the U.S. after the independence. In reality, GDP during the period from 1953 to 1960 showed an annual growth rate of 3.8%. While the growth was only half as fast as the growth in the 1960s, this cannot be considered stagnation taking into account the country's devastated economy before and after the war.

Lastly, the change of policy in 1957 is notable. From the mid-1950s, the belief that the most effective means to outrival the Communist is to facilitate economic growth was already widespread. The U.S. government shared the same belief and separated economic aid from military aid, enlarging the scale of the former while reducing that of the latter. In addition, it introduced development loan fund, while abolishing free assistance. Accordingly, U.S. assistance to Korea began to dramatically decline after 1957, the year in which the aid reached its peak. The U.S. also requested Korea to reduce massive fiscal deficit and to control inflation by adopting the Financial Stability Plan (1957-1960). This opened a new and official avenue for Korea to learn the necessary techniques and methods to regulate currency.

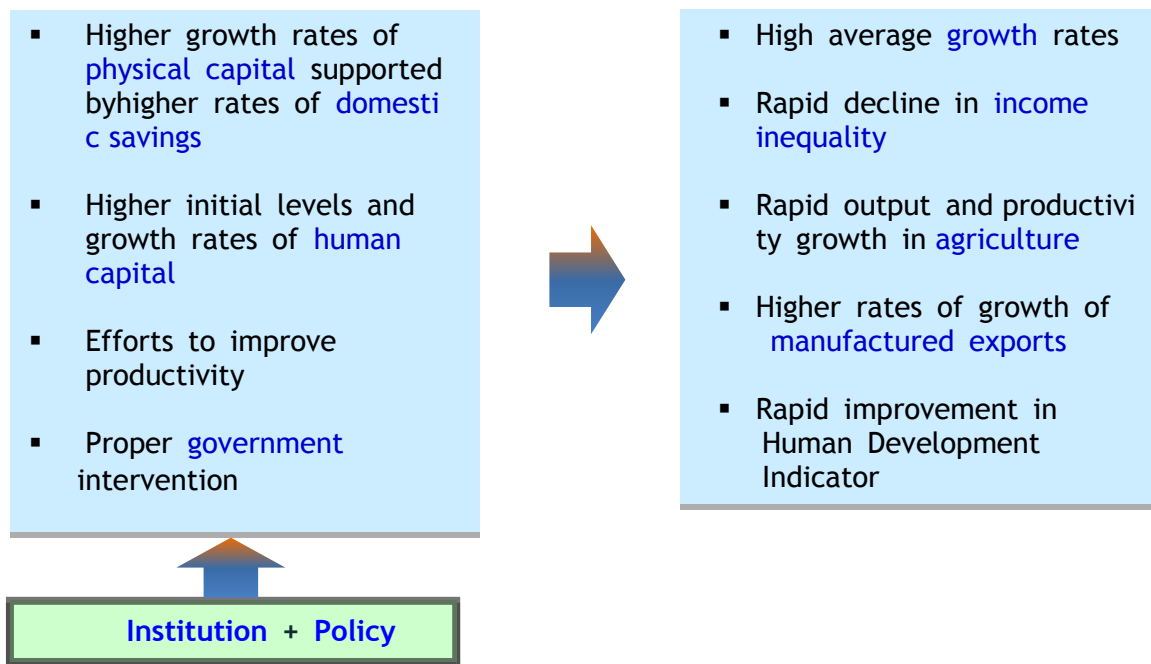
Chapter 3

An Overview of the Era of Economic Growth

The Park Chung-Hee Administration, which seized the power in 1961, consistently maintained the industrialization of the Korean economy and export-oriented economic development. As a result, Korea was able to create a foundation for rapid growth. Taiwan, Singapore, and Hong Kong are some of the economies which achieved similar economic development at the time. The World Bank (1993) analyzed the common features of their economy and especially the major cause of their high growth rate as summarized in Figure 2.

This chapter will briefly discuss the major factors of Korea's economic growth based on this framework and about the structural changes in the industry, the role of export and the change as well.

Figure 2 Common Features of Economic Developments in East Asia



Source: World Bank (1993, Revised).

The economic development that Korea achieved after 1960 can be found in numerous statistics. Korea's per capita GDP soared from US\$1,298 to US\$23,893, increasing 18-fold from 1970 to 2013 (in 2005 dollars). It amounted from only 16% of that of the U.S. in 1970 to 52% in 2013. The economic growth also brought about a better quality of life, and the average life

expectancy increased 1.5 times compared to 1960, from 52.4 to 81 in 2012. The mortality rate of infants significantly dropped from 70.0 for every thousand infants during the period from 1960 to 1965, to 3 in 2013. Politically, the Korean society was moving away from authoritarianism and beginning to establish democratic social order. South Korea, all in all, was considered a rare case, which achieved both economic and political development.

There are not many countries around the world that maintained their economic developments for such long time as did Korea. Most of the developing countries failed to catch up with the advanced countries. Their economic growth spurted rapidly and then slowed afterwards, or the gap between their economy and that of the advanced countries simply widened. However, the East Asian countries, including Korea, reduced the income gap with the advanced countries, and the distribution of income became reasonable. The economic and social achievements of East Asian countries were even denoted as a miracle. Two major theories are suggested so far on the role of governments, which made their success possible.

To begin with, there exists a market-friendly view. It argues that high growth rate was possible because the government stabilized macroeconomy and generated human capital. However, it also suggests that government intervention consisting of supporting selected industries did not result in desired effects, but negatively influenced the growth by distorting the distribution of resources. According to this view, the merit of governments of East Asian countries is the formation of market and its efficiency.

Secondly, there is a developmental-state view. It argues for the necessity of government intervention at the very initial stage of economic development because there is a high risk of market failure in mobilization of resources, investment distribution, and acquisition of technology, and as such there is a need to correct this issue. It continues to argue that the governments in East Asia artificially adjusted price, so that they could promote certain industries and correct market failures. Wade (1990) argues that even Taiwan, which is known for its market-friendly policies, intervened in the market at large scale and was able to achieve a great development.

Levels of government intervention vary among Asian countries. While Hong Kong took laissez-faire policy, Japan, Taiwan and Korea intervened in the market at a significant level; amongst all, the strongest intervention happened in Korea. In comparison, Malaysia, Indonesia and Thailand took different paths from these countries by making use of their affluent natural resources and attracting foreign investment. China and India, the latecomers to development, are not only

attracting foreign investment but also promoting foreign direct investment.

It is difficult to pinpoint whether the market-friendly or developmental-state view was predominantly applied to Korea. However, it is important to note that such discussion only applies at the very initial stage of economic development. Even the one who argues for the developing nation perspective concedes that government should not keep intervening in the market once the growth of economy and market reach a point of satisfaction. This is because such intervention distorts prices and yields numerous undesirable side-effects.

In the case of Korea, due to the suppression of finance, the industry could not become self-sustainable. Moreover, the widely believed theory of “Too Big to Fail” with the premise that the government will never fail *chaebol*, or Korean conglomerates, due to astronomical costs, accumulated debts in the business sector and caused finance sector insolvency. Economic power was concentrated in *chaebol* during the process of fostering the heavy and chemical industry and through industrial reconstructing. The fiscal policy, which focused on economic growth, yielded a high level of inflation, delayed the progress of democracy and the growth of national autonomous capacity. The export-oriented development policy with a focus on the manufacturing industry discriminated against the service industry, which holds the largest share in value-added and employment of the Korean economy, resulting in the very low productivity of the service industry.

In the 1980s, the government reduced its intervention in the market and began to open itself to foreign interactions. The foreign exchange crisis which occurred in 1997 accelerated such tendency. Some scholars view such change as the coercion of international organizations and some advanced countries that controlled international politics. However, it is more likely that the change resulted from the increased scale of the Korean economy, and the intensified development of various areas of the market, such as product, capital, and labor, which altogether made it fundamentally impossible for the government to control the market. The foreign exchange crisis only facilitated such process.

Chapter 4

Sources of Economic Growth

1. Growth Dissemination and Investment

A rapid economic growth and the change in industry structure are caused mostly by the fast accumulation of capital. From the mid-1970s till present, Korea maintained the investment rate up to 30-40%, and it even reached 40% at its highest peak in 1991. While domestic investment was chiefly supplied by domestic savings, the current account loss from the mid-1960s to the mid-1980s also played an important role in developing the economy.

Krugman (1994) noticed that East Asian countries' economic growths were achieved more by the accumulation of capital than by the improvement of productivity. Therefore, he predicted that there would be a slowdown in the economic growth of these countries as soon as the law of diminishing returns to scale took effect. His argument is largely dependent upon a series of growth accounting results released by Young (1992, 1993, and 1995). When the growth factors are decomposed and analyzed through growth accounting, the contribution of total factor productivity (TFP) is significantly larger than that of the accumulation of wealth to the economic growth. Research conducted by Hahn and Shin (2010) also draws a similar conclusion (Figure 1). In the case of Korea, the GDP per person employed increased by 4.7% each year on average from 1961 to 2004. 1.8% out of this growth rate was caused by the increase of TFP, and 2.9% by the capital stock increase per person employed. For advanced countries, the statistic of the former was 2.1% and the latter was 1.1%. In other words, TFP's contribution of Korea, which was 38%, was smaller than that of advanced countries, which was 52%.

What is significant in Table 1 is that the increase rate of TFP in Korea, in terms of absolute value, was remarkably high. It was higher than any advanced countries, not to mention developing countries. The improvement of human capital, advanced technologies, redistribution of resources, and international trade all together highly influenced the improvement of productivity. As such, it is necessary to look more closely at the underpinning of high productivity, which was the foundation of Korea's previous economic development and also of its future development.

Table 1 Decomposition of Economic Growth by Major Regions (1961-2004)

(Unit: %)

	GDP Growth	GDP Growth per Person Employed	Contribution to Economic Growth	
			Capital Accumulation per Person Employed	TFP Increase
Total (83)	4.0	2.4	1.2	1.3
Advanced countries (22)	3.3	2.1	1.1	1.1
South Korea	7.1	4.7	2.9	1.8
1961-70	7.7	4.7	3.0	1.6
1971-80	7.3	4.6	3.8	0.8
1981-90	8.6	6.1	2.8	3.4
1991-2000	5.8	4.1	2.7	1.5
2001-04	4.5	2.9	1.3	1.5
East Asia (5)	5.7	2.8	1.8	1.0
Central and South America (22)	3.7	1.0	0.6	0.4
South Asia (4)	4.9	3.0	1.1	1.8
Sub-Saharan Africa (19)	3.4	1.0	0.6	0.3
Middle East & North Africa (9)	4.4	2.0	1.2	0.9

Note: Numbers in parenthesis () represent the number of countries for each column.

Source: Hahn and Shin (2010).

2. The Development of Human Capital and its Contribution to Economic Development

Both development of human capital and education were suggested as important factors of Korea's economic development. The development of human capital, however, is not only visible in the quantitative growth of the country but also in its qualitative growth such as democratization, advancement of institution and governance. It should also be noted that education is the factor which differentiates Korea's economic growth from that of other countries.

Table 2 South Korea’s Economic Development and its Educational Policy

Development Phase		Economic Development	Educational Policy
Phase 1 (1945-1960)		Agricultural society, post-war reconstruction, and export-oriented industrialization	The formation of primary education system, universal primary education
Phase 2-1	1960s	Labor-intensive industrialization centered around light industry	Expanding focus from primary education to secondary education
Phase 2-2	1970s	Industrialization through heavy & chemical industry, full support to <i>chaebol</i> and large corporations	Job skill training and education and its development
Phase 3 (1980-1990)		Technology, knowledge, and information based industrialization	Expanding focus from secondary education to higher education
Phase 4 (After 2000)		The entrance into global economy, information, technology, and knowledge- based economy	Expansion of higher education Information technology education, life-long education, human capital development at a national level

Source: KDI (2006).

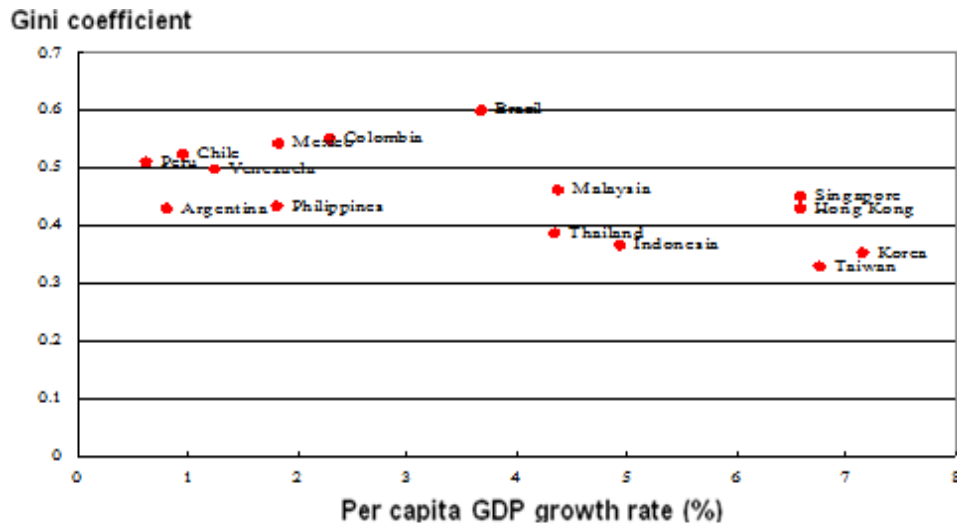
The conformity of the educational policy by period with the state’s development goals sharply reflects the distinctive relationship between education and economic growth in Korea. After the Korean War ended, the government in 1954 executed its Six-year Human Resource Development Plan that focused on universal primary education. More educational investments were made, as the Education Tax Act in 1958 came into effect, and subsequently, the government’s educational budget share increased from 4.2% in 1954 to 14.9% in 1959.

The effort to universalize primary education despite a harsh economic circumstance effectively reduced the illiteracy rate of the young laborers, and it became a driving force in creating labor-intensive industries as the primary engine for economic development. The central aim for education in 1960 was to provide basic education to laborers to work in light industries and labor-intensive industries. Therefore, the focal point of education in South Korea at the time was in practicality, anti-communism, and establishment of law and order (Bae, 2007). The labor-intensive industry as the driving force of the economy is evaluated to be a consistent policy in terms of our economy’s comparative advantage.

Universalizing primary education and initiating economic growth with labor-intensive industries contributed to the “inclusive” growth of the Korean economy (Figure 3). From 1965 to

1990, South Korea's Gini coefficient was one of the lowest, while its GDP per capita growth rate was at the highest level among developing countries. It is noteworthy that other East Asian countries during the same period, which emphasized primary education at the beginning of economic development, achieved better Gini coefficient than other developing countries.

Figure 3 Gini Coefficient and Economic Growth (1965-90)



Source: KDI (2006).

Table 2 shows how readily the focus of education changed in parallel with the industrial transformation. Due to national security and desire to transform into higher value added industries, Korea initiated the Heavy and Chemical Industries (HCI) Drive since the early 1970s with an emphasis on its six leading industries: iron and steel, electronic and electric, shipbuilding, non-ferrous metal, machinery, and petro-chemical.

The HCI Drive required skilled workforce, and the Korean government began to prepare itself to such demand from the late 1960s. At the national level, the government strongly pushed its own educational policy forward, emphasizing secondary education in addition to primary education and establishing vocational and technology high schools since the late 1960s. These vocational and technology high schools aimed to train intermediate-level engineers, who later became an important asset when the nation began the HCI Drive in the 1970s. Education in schools throughout this period was discipline-oriented with a major emphasis on science and technology. Vocational skills and engineering were also emphasized.

In the 1980s, Korea deeply engaged in the HCI, and the whole industry experienced a sea

of restructuring. The share of the light industry had decreased remarkably and replaced by the HCI. As the HCI expanded rapidly and the industries developed to produce more elaborated products, the emphasis of education policy again shifted to produce more highly educated human capital (KDI, 2010). In 1981, the quota of new entrants to universities was largely expanded, and the government also allowed the establishment of more universities (KDI, 2010). While it is controversial whether this sudden increase in the number of universities and university students served to be beneficial in terms of the entire nation's efficient allocation of labor, it is clear that those who were educated in universities became the crucial manpower leading the evolution of industrial development and economic growth (KDI, 2010).

Nowadays, about 80% of high school graduates in South Korea enter into universities, and the focal point of education policy is shifting to the development of human capital, which corresponds with the national strategy and promotes life-long learning. Such shift is grounded upon a belief that Korea is now facing many challenges, and especially upon a belief that a proper expansion of human capital is essential in consistently pursuing globalization and overcoming its potential problems of a rapidly aging society.

Then, to what extent can education contribute to the economic development of one nation? Given the premise that education contributes to the economy by improving the quality of labor power, in the case of Korea, the quantitative contribution of labor decreased very rapidly, while its qualitative contribution generally increased despite some fluctuations (Table 3). The contribution of labor-quality to the economic development decreased since 1945 until 2000, but the amount to which it accounts for labor-total significantly increased. Consequently, it can be viewed that the qualitative contribution of labor was more vital to economic growth than quantitative contribution of labor.

Table 3 Contribution of Labor on Economic Growth (%): the South Korea Case

Period	Labor-Quantity	Labor-Quality	Labor-Total
1945-75*	2.13	0.71	2.84
1966-70**	3.13	0.71	3.84
1970-75**	2.68	0.68	3.36
1980-94**	1.7	0.79	2.49
1996-00***	0.5	0.6	1.1
2001-05***	1.0	1.0	2.2

Source: *, **, *** are sources from McGinn et al. (1980), Choi (1997), and KDI (2007), respectively.

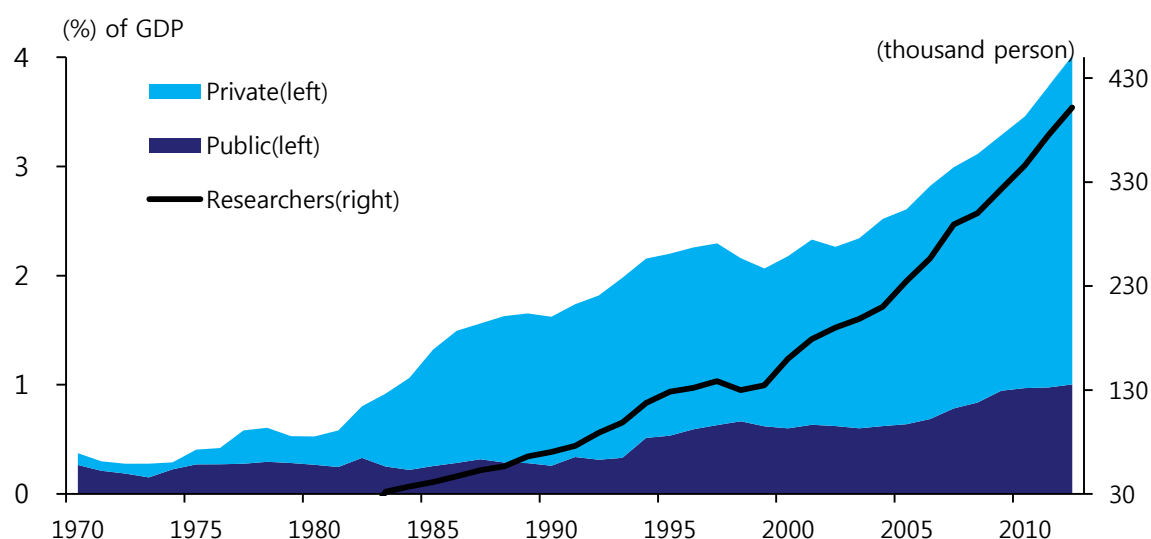
3. Technology Advancement and Economic Growth

The major driving forces of technology advancement include domestic R&D activity, the import of capital goods which embodies advanced technology, the direct purchase of foreign technology, foreign direct investment (FDI), etc. The technology advancement through FDI includes the technological activity of a foreign firm while doing business in Korea, and the activity of a domestic firm that directly purchases the technology by taking over a foreign firm. In addition, the exporters in a developing nation acquire a new knowledge concerning product development, product manufacturing, and marketing. The knowledge is then spread to other domestic companies, generating positive externalities over the whole nation. International trade also highly motivates domestic companies to pursue innovative activities through technological advancement, as it provides a better opportunity of creating more profits by expanding the market in which a product can be sold, and also as it creates a growing need to compete with foreign firms in the international market.

All these factors seem to have played a critical role in the technological development in South Korea. First of all, domestic R&D investment began to rapidly grow in the 1980s, as the competition between companies within the domestic market was being intensified, with the private sector as its central axis (Figure 4). The recent share of R&D investment (3.4% of GDP in 2008) is estimated to be the highest at the global level. Secondly, the majority of imports have been raw materials and capital goods, and the import of capital goods significantly contributed to the domestic technological improvement. For instance, in 2000, the amount of capital goods import for

domestic use amounted to 57% of the amount invested in domestic equipment (Table 4). Thirdly, the amount spent on patent rights as the indication of direct purchase of foreign technology has been increased until now (Figure 5).

Figure 4 Expense on Research and Development



Source: National Statistical Office's National Statistics Portal (<http://www.kosis.kr>).

Table 4 Imported Goods Structure

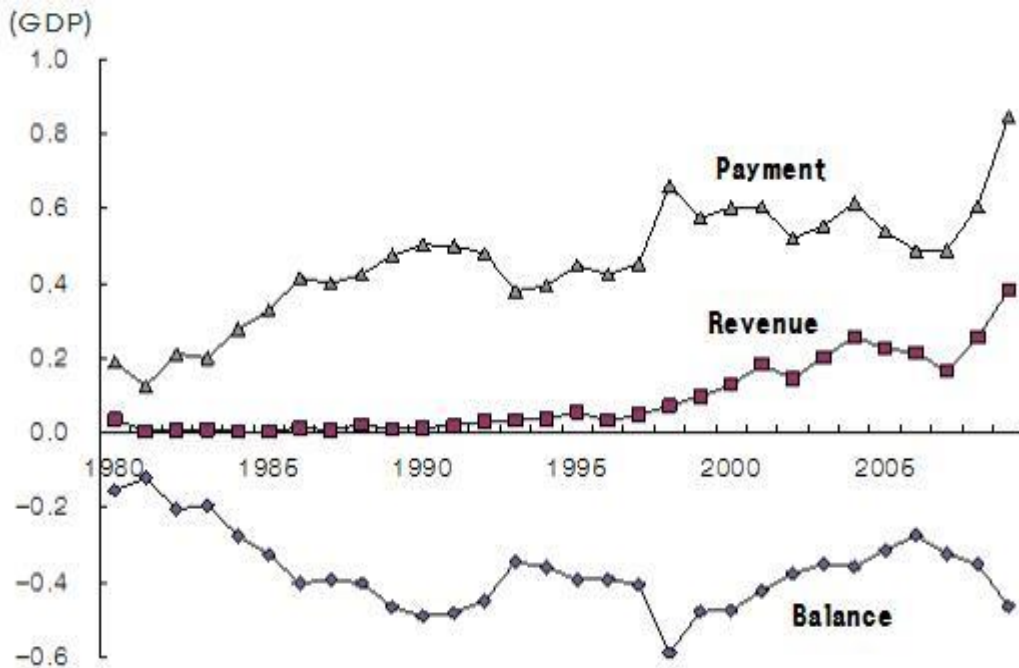
(Unit: 1 billion USD, %)

	1970	1980	1990	2000	2009
Total Import ¹⁾	2.0	22.3	69.5	160.5	323.1
Raw Materials Import (Share in total import, %)	1.0 (52.9)	14.5 (65.0)	38.2 (54.9)	81.6 (50.8)	186.1 (57.6)
Capital Goods Import (Share in total import, %)	0.5 (23.1)	5.1 (23.0)	25.6 (36.8)	64.6 (40.2)	104.0 (32.2)
Capital Goods Import for Domestic purpose (Share in total import, %)				37.2 (23.2)	59.1 (18.3)
(Share in GDP, %)				(7.0)	(7.1)
(Share in total fixed capital formation, %)				(23.2)	(24.2)
(Share in equipment investment, %)				(56.7)	(77.8)
Consumption Goods import (Share in total import, %)	0.5 (24.0)	2.7 (12.1)	5.7 (8.2)	14.0 (8.7)	32.7 (10.1)

Note: 1) Includes imports of other goods as well as those of raw materials, capital goods, and consumption goods.

Source: KFTA (<http://www.kita.org>); The Bank of Korea's Economic Statistics System (<http://ecos.bok.or.kr>).

Figure 5 Usage Fee Balance (e.g. Patent Rights)



Source: National Statistical Office's National Statistics Portal (<http://ecos.bok.or.kr>).

4. Redistribution of Resources

Another source of improvement in productivity is redistribution of resources. In other words, by carrying resources such as human resources and capital from a low-productivity sector to a high-productivity sector, it improves the general productivity of the overall economy. A typical example is carrying the resources from an agricultural sector to a manufacturing sector and, within the manufacturing sector, from a light industry to a heavy chemical industry, and finally from a rural area to an urban area. When these resources flow in such direction without any disturbance, the productivity of the overall economy increases.

On the other hand, if such resources are constrained with many restrictions, the improvement in productivity slows down. The redistribution of resources cannot be done in a flexible manner under these circumstances, such as if a labor market is frustrated, the regional movement of resources is obstructed and a government cannot protect a declining industry or an insolvent enterprise, or if financial intermediation does not work properly, and lastly, if there is no infrastructure to support the development of a city.

The redistribution of resources in Korea seems to have progressed fairly smoothly until now. The fact that Korea's industrial structure has rapidly changed supports this speculation. According to Kim (1998), the TFP increase from 1970 to 1986 was estimated to be 1.45% annual average, and 0.74% of this rate was claimed by the technological advancement and 0.71% by the redistribution of resources. In other words, the redistribution of natural resources contributed to the improvement in productivity as equally as the contribution of technological advancement. Concerning the labor market, Kim and Topel (1995) suggest through an analytical research result that the labor movement was active not only in the regional aspect from a rural area to urban area, but also within the manufacturing industry itself. Although the flexibility of labor movement somewhat decreased due to the limited supply of labor, it continued to remain at the high level.

The resource movement from one region to another is also seemed to have flown smoothly, considering the fast urbanization level. The government has expanded the infrastructure of cities as a response to the over flocking of population to cities. In terms of GDP, the present fund stock in the public sector is revealed to be not so low compared to that of advanced countries (Choi, Yoo and Park, 2005).

There are also many cases in which the government impeded the redistribution of resources. It promoted a huge scale of guidance finance policy, artificially promoted the heavy chemical industry, repeatedly relieved insolvent companies, and implemented policies to protect small businesses. Above all, it deterred the effective development of finance intermediation ability by oppressing finance for a long time. Whether these policies ultimately made a positive impact on economic growth and restructuring is still in dispute.

5. The Contribution of International Trades to Economic Growth

A question which arises in the discussion of redistributing resources concerns the task of finding a factor which actually promotes such redistribution. To begin with, the government can be thought as one possible factor. As explained previously, the government can influence, both intentionally and unintentionally, the redistributing resources. However, the government cannot be a sole factor. What are other factors thought to be involved in the process? It can be said that a high-profit in a high-productivity sector is what draws both manpower and capital.

However, if the scale of a market is limited, the movement of resources can be inevitably constrained, as there is a certain limit in creating profits and therefore, it can only be done at a

limited level. This is why the importance of international trade is emphasized. The international trade helps to overcome the limits of domestic market, and increases the possibility of specializing the comparative advantage sector within a sector of a nation. If South Korea had not acquired new markets abroad, it would have been impossible to achieve such a relatively high level of industrialization.

It is necessary to explain more in detail about the concept of comparative advantage. Traditionally, the comparative advantage of one nation over another was thought to be determined by innate natural resources that include human capital and geographic location. However, as the intra-industry trade dramatically increases, the importance of natural resources as the decisive factor of comparative advantage has been consistently declining (Gill and Kharas 2007, p.13). If natural resources are such decisive factors, each country should specialize in a certain industry. However, having a similar industrial structure with other countries, each country rather shows a tendency to specialize in producing the product of its own specialty.

This can be interpreted as each country utilizes the economy of scales. In other words, by specializing in a specific product in the vast world market which the international trade can provide, it realizes the economy of scale, and in such process, cements its position of having comparative advantage with the improvement in productivity achieved through ceaseless innovations. According to this analysis, comparative advantage is not solely decided by the static natural resources, but rather changes more dynamically. The industrial accomplishments, which Korea has achieved, so far, can be explained with this more dynamic evolution of comparative advantage.

Chapter 5

Structural Changes in the Korean Economy

1. The Transformation of Industry Structure

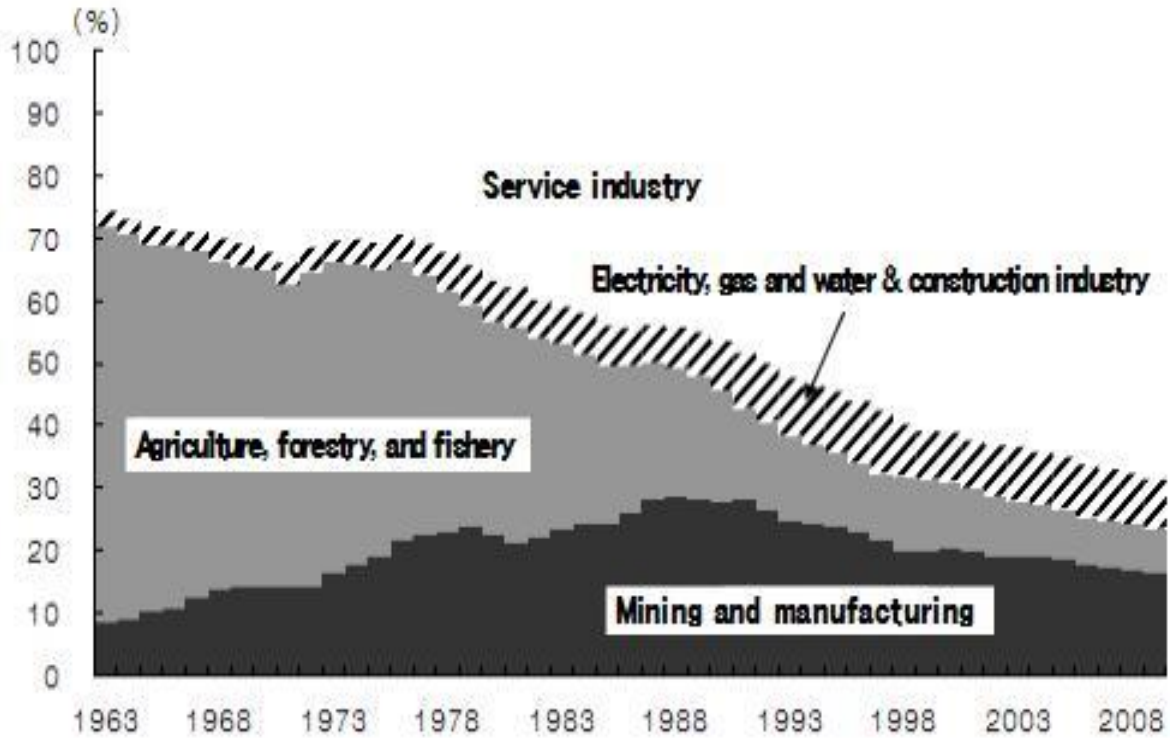
From the 1960s, the economy of South Korea showed a rapid growth. Its economic development was mostly led by manufacturing, the value-added of which increased by 17% on an annual average in the 1960s and by 16% in the 1970s. As a result, the portion that manufacturing accounted for in the total value-added amounted to 28% on average from 1971 to 1980 (Table 5), a significant growth from 12% on average from 1953 to 1960. The employees in the manufacturing industry rapidly increased and accounted for the large share of the total employment (Figure 6). The importance of the heavy chemical industry within the manufacturing industry was much more weighted, while the weight on the light industry lessened. With this phenomenon, the service industry also grew consistently. While the value-added in the agricultural sector constantly increased, the industry gradually lost its importance over time.

Table 5 Weight of Value-added in Each Sector

	1953-60	1961-70	1971-80	1981-90	1991-2000	2001-09
Agriculture, forestry, and fishery	41.9	35.5	24.6	12.4	6.0	3.4
Mining and manufacturing	13.4	19.1	24.0	28.4	26.9	27.3
Mining industry	1.4	1.8	1.3	1.1	0.5	0.2
Manufacturing industry	12.0	17.3	22.7	27.3	26.5	27.1
Light industry	9.5	11.5	11.3	9.8	6.5	4.5
Heavy & chemical industry	2.5	5.8	11.4	17.5	20.0	22.6
Electricity, gas and water & construction industry	3.7	5.2	6.8	10.0	11.9	9.6
Electricity, gas and water	-	-	1.4	2.7	2.1	2.2
Construction	-	-	5.5	7.3	9.7	7.4
Service industry	41.1	40.2	44.5	49.2	55.2	59.6
Gross value added	100.0	100.0	100.0	100.0	100.0	100.0

Source: The Korea Bank Economics Statistics (<http://ecos.bok.or.kr>).

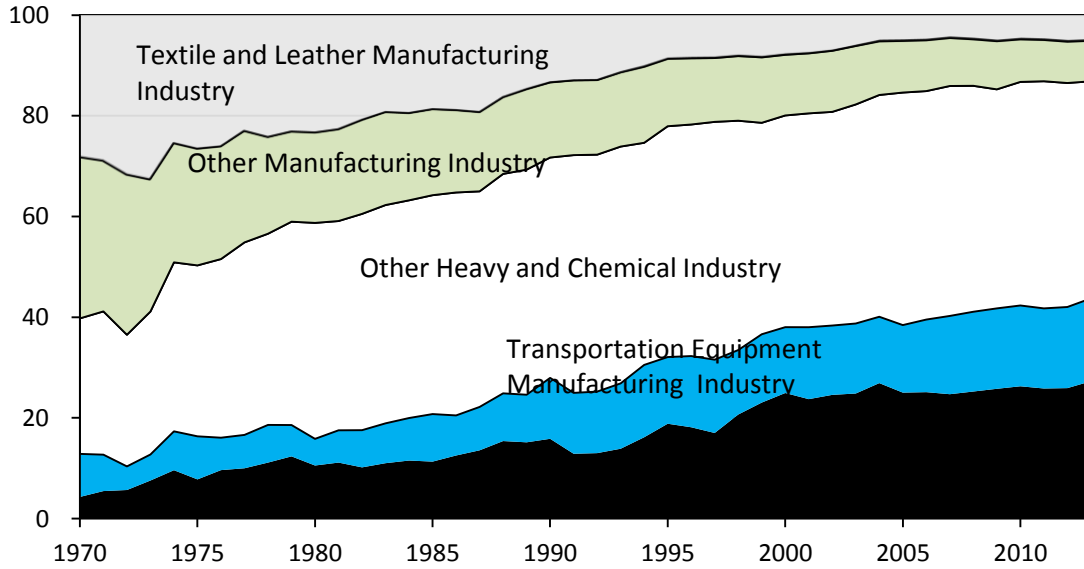
Figure 6 Share of Employees in Each Sector



Source: The Korea Bank Economics Statistics (<http://ecos.bok.or.kr>).

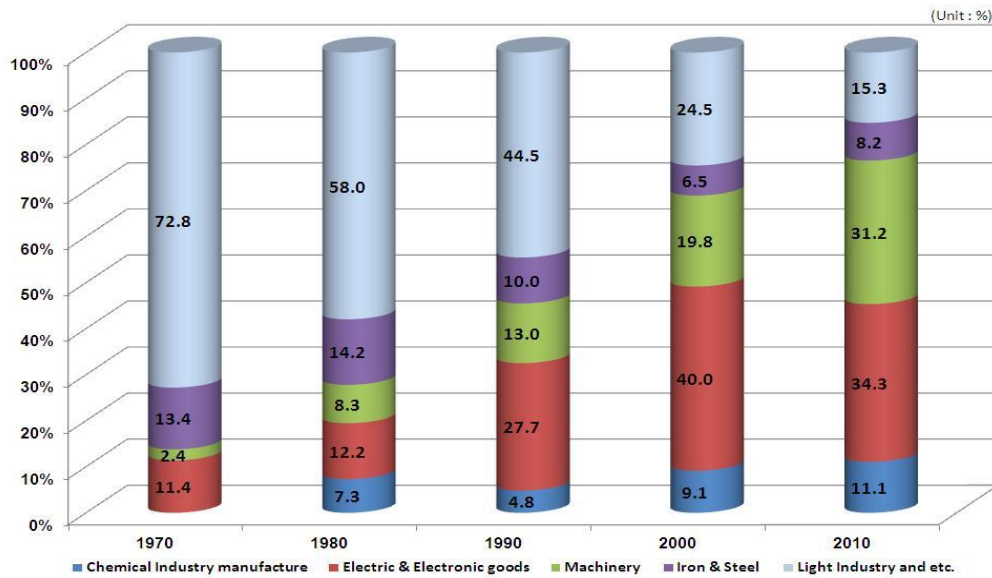
A similar change is also found in the export product structure (Figure 8). In the 1970s, the primary industry products accounted for 17% of the total export products, the light industry accounted for 70%, and the heavy chemical industry accounted for 13%. However, in 2008, this ratio changed to 2%, 6%, 92%, respectively, and therefore the heavy chemical industry accounted for the largest part of the export. The top 10 export products also rapidly changed over time (Table 6).

Figure 7 Share of Value-added in Each Industry within the Manufacturing Sector



Source: The Korea Bank Economics Statistics (<http://ecos.bok.or.kr>).

Figure 8 Share of Each Product in Export



Source: The Korea International Trade Association International Trade Research Institute - Major Trade Indicators, 2010.

Such changes in the industrial structure are also observed in other countries. The industrial structure of Korea in the 1960s is similar to that of the UK in 1700, that of the U.S. before 1880, and that of Japan in the early 20th century. In these countries, the manufacturing and service

industries began to replace agriculture. The noteworthy aspect in the case of Korea is that such change happened at a very fast pace. Thirty years after Korea's industrialization, its industrial structure in the 1990s became similar to that of the UK in 1890, the U.S. in 1950, and Japan in 1970.

For international comparison, Yoo (1997) defined industrialization as a period in which employment weight on agricultural sector dropped to less than 20% from 50%. Figure 9 shows that it took longer for early industrial countries to achieve industrialization.

It is a common phenomenon for all countries in that the economic weight of the light industry soon transferred to the heavy chemical industry. However, as it happened very rapidly, the industrialization of South Korea can be described as a compressed growth.

Table 6 Top 10 Export Products

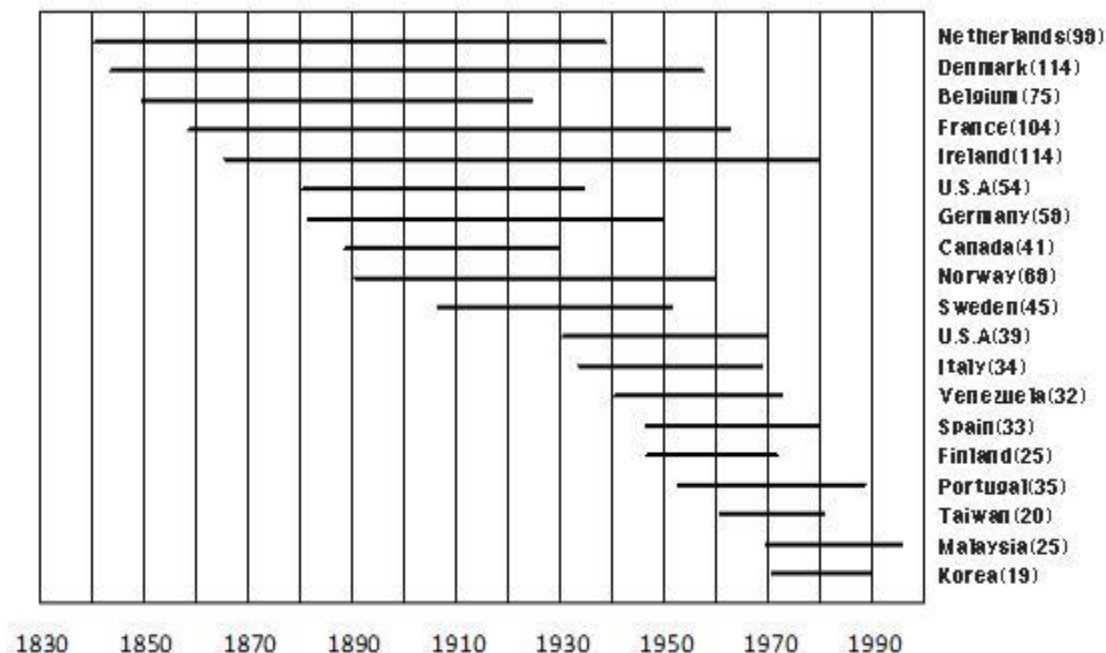
(Unit: %)

Rank	1961		1970		1980	
1	Iron Ore	13.0	Textile	40.8	Textile	16.0
2	Tungsten	2.6	Plywood	11.0	Steel Plate	5.4
3	Raw Silk	6.7	Wig	10.8	Footwear	5.2
4	Anthracite	5.8	Iron Ore	5.9	Ship	3.6
5	Squid	5.6	Electronics	3.5	Sound System	3.4
6	Fresh Fish	4.5	Confectionary Products	2.3	Artificial Long Fiber	3.2
7	Graphite	4.2	Footwear	2.1	Fabric	2.9
8	Plywood	3.3	Tobacco & Copper	1.6	Rubber Goods	2.8
9	Rice	3.3	Goods	1.5	Wood and Cork Flooring	2.6
10	Swine Bristles	3.0	Steel Products	1.5	Imaging Device	2.5
			Boilermaker		Semiconductor	
Total		62.0		81.1		47.6
Rank	1990		2000		2009	
1	Clothing	11.7	Semiconductor	15.1	Marine Structure & Components	12.4
2	Semiconductor	7.0	Computer	8.5	Semiconductor	8.5
3	Footwear	6.6	Car	7.7	Wireless Communication	7.0
4	Imaging Device	5.6	Petroleum Products	5.3	Apparatus	7.0
5	Ship	4.4	Ship	4.9	Flat Display & Sensor	6.3
6	Computer	3.9	Wireless	4.6	Automobile	3.6
7	Sound System	3.8	Communication	2.9	Petroleum products	3.3
8	Steel Plate	3.8	Apparatus	2.8	Synthetic Resins	3.2
10	Artificial Long Fiber	3.6	Synthetic Fiber	2.7		

	Fabric Automobile	3.0	Steel Plate Clothing Imaging Device	2.1	Steel Plate Automobile Components Computer	2.2
Total		53.4		56.6		62.2

Source: The Korea International Trade Association International Trade Research Institute - Major Indicators of the Trade, 2010.

Figure 9 International Comparison in the Period of Industrialization



Note: The numbers in parenthesis () represent the years spent in each country for achieving industrialization.

Source: Yoo (1997).

2. The Structural Change in Trade

As previously discussed, international trade stimulates technological advancement by means of importing foreign capital goods and advanced technologies, and by directly investing into a foreign country. Moreover, it enables “learning by exporting” and provides the motivation for innovative activities. It also allows many domestic companies to achieve the economies of scale and to strengthen their comparative advantages. A series of analysis on the actual proof shows that the international trade of South Korea made an important contribution to the growth of its economy (Hong, 1979; Nam, 2008; and Lee, 2008). Some scholars argue that the economic success of East Asia is primarily caused by the exporters who provided a free-trade economic environment (Radelet, Sachs, and Lee, 1997). The rapid expansion of the world market after the war provided a

good opportunity for East Asian countries to improve their productivities and attain a rapid economic growth (Yoo, 1997).

Park's Administration announced early on that their goal was set on economic development. The ideological character of the administration can be hardly viewed as that of laissez-faire. Nevertheless, the direct motive to pursue an active stimulation of export can be speculated to be the decrease in the foreign exchange reserves. Foreign exchange reserves in 1961 was US\$205 million, which began to decline from March 1962 and drop to US\$107 million, almost half of that in 1961. The reason for the decrease was due to the introduction of short-term commercial loans to prepare the Five-year Economic Plan from 1961 to 1962 without considering repayment. The possibility of impending crisis was heightened, as the foreign exchange reserves decreased. Amidst this situation, the Park Administration executed the import-export link system extensively, which was to allow exporters to acquire the permission to import based on their export performance.

A rate of exchange has strong ties to export. The exchange rate dramatically dropped in February and October of 1960 and in February 1961, and the official exchange rate dramatically increased from 50 Korean won to 130 Korean won to a U.S. dollar. Consequently, the overestimation on Korean won has been much resolved. After the won's depreciation, exports dramatically increased. Exports in 1960 increased more than 66% and then increased by 43% annually until 1964. Amongst all, the export of labor-intensive light industry products increased remarkably.

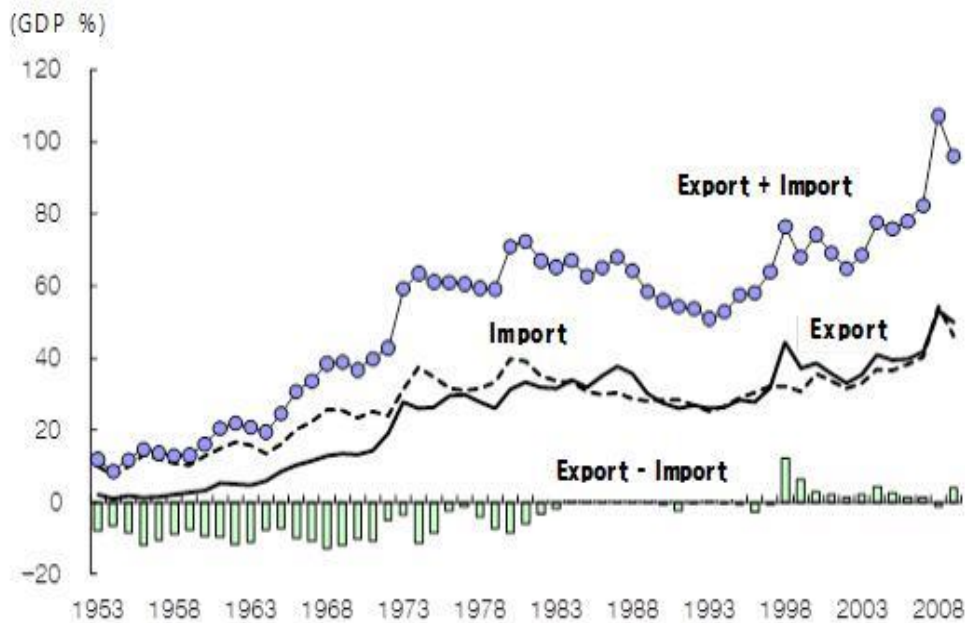
Considering this fact, it cannot be said that a monetary enticement for exporters caused the dramatic increase in the export of the light industry. SaGong and Johnes (1981) suspect that other factors played more important roles in increasing exports other than the monetary enticement. The most important factor was the decrease in opportunity cost. In the past, it was possible to obtain massive benefits through foreign exchange with some privileges without any risk. Because of this, there was no need to take an enterprise spirit to explore foreign markets and produce products that are competitive at the international level. To overcome the situation, the reform of the exchange rate system was carried out in order to eradicate the root of the economic zone that is characterized by zero sum, reduce the opportunity cost, and stimulate productive positive sum activities. The declining uncertainty of transaction cost and exchange fluctuations as a result of the reform, and the government action to prioritize economic development and guarantee consistent support for enterprises are suspected to be important factors in motivating the entrepreneurs' productive

activities.

As the export in the early 1960s surged, the government earnestly pursued an export promotion policy. First, it devaluated the exchange rate at great level. On May 1964, the government changed the multiple exchange rate system to a single flexible exchange rate system, and almost doubled the currency rate from 130 Korean won to 255 Korean won to a U.S. dollar. After March 1965, when the single flexible exchange rate system went into effect, the real exchange rate remained at a stable level. Korea's real U.S. exchange rate and real effective exchange rate remained within the range of 80 to 120, except during the foreign exchange crisis period, when the average value was set at 100.

Many inducement systems for export promotion were forfeited thanks to the swift administrative support by the government. First of all, the government introduced export targeting and therefore collected data on export estimates of individual enterprises and then set the total export goal annually. Secondly, it held an export expansion meeting presided by the president and participated by government officials and export business representatives to check whether the set goal was achieved or not and to evaluate performance. If the result was poor, the participants tried to find solutions for the problem. The Korea Fair Trade Association (KFTA) was launched in order to stimulate export at the enterprise level and also the Korea Trade-Investment Promotion Agency (KOTRA) was launched to build foreign networks and deal with export marketing and market data collection. After 1960, exports increased dramatically (Figure 10).

Figure 10 Change in the Import and Export of Korea



Source: The Korea Bank Economics Statistics (<http://ecos.bok.or.kr>).

Additionally, the government extensively executed import regulations to protect domestic industries and to promote export however; the import regulation had an adverse effect on export. In other words, if the domestic price of a product increased due to the import regulation, a company would try to produce and sell within a domestic market. And, if the demand for import decreases, the demand for foreign exchange decreases, and the export is constricted because of the increased value of domestic currency. Westphal and Kim (1982) report that such negative effects were almost compensated by the export promotion policy. In other words, this policy provided a free-trade environment to exporters and promoted integration into the world market.

The government pursued consistent import-export liberalization due to interior and exterior necessities. The import liberalization measures in 1978 were ceased during the period from 1979 to 1980 due to the second oil crisis. However, after this, it was pursued again, and especially in 1984 when the exterior imbalance was resolved due to the oil crisis; thereafter it was earnestly maintained. The government introduced the Five-year Import Liberalization Model Plan and began to expand import liberalization gradually. As the current balance returned to profits and as its scale expanded, South Korea implemented GATT Article 11 in January 1990. Moreover, as commerce frictions intensified between the U.S. and Korea with the expansion of

consistent trade surplus, the government began to relieve the restriction with a non-tariff barrier policy on import. The average legal tariff rate dropped from 34.4% in 1981 to 9.8% in 1995, and the liberalization rate from quantity regulation increased from 60.7% to 92.0%.

In pursuing the liberalization of import, improving the competitiveness of the industry by opening up the market rather than increasing the consumer benefits through free-trade was regarded more important. International balance of payments was also an important factor to consider, and the halt of import liberalization from 1979 to 1980 as well as the introduction of multilateral trade system can be taken as examples. Nevertheless, the liberalization of imports in the manufacturing sector was consistently pursued from 1980, and in the mid-1990s, it was achieved at the level of OECD nations. However, the protection of the agricultural sector persisted.

On the other hand, the opening of the capital market progressed slower than that of the commodity market. Worrying over the uncertainty of macroeconomics, the government took a cautious stance on the opening of the capital market. Especially, the worries over the imbalance of international payments and the increase of money supply were significant, and such justifiable worries were natural considering the situation in which the flexible fluctuation of the currency rate as the coordinating mechanism of domestic and foreign imbalance was not possible.

As the pressure from the U.S. government and international organizations to stop manipulating the exchange rate increased due to the massive current account surplus in the late 1980s, the government changed from the multi-currency basket system to a market-average rate system. However, the fluctuation of the exchange rate did not change much, limited to 6.25% fluctuation, and the drift of the change was not significant due to the consistent intervention of the government into the foreign exchange market.

Chapter 6

Conclusion

In the past sixty years, South Korea has achieved both rapid economic growth and industrialization. The value-added of its industry sector (manufacturing, construction, capital, electricity, and gas business) more than doubled from 17% of the total value-added in the 1950s to 38% in the 1980s; after this period, it has been fluctuating at a narrow range. The value-added of the service sector consistently augmented from 41% in the 1950s to 60% in the 21st century. On the other hand, the value-added of its primary industry, including agriculture, forestry, and fishery dramatically dropped from 42% to 3%. With the industrialization, integration into the world market also rapidly progressed, resulting in the trade accounting for 80-100% of GDP in the 2000s from only 10% in the 1950s.

The Korean economy was able to upgrade to this level because it achieved economies of scale on the international level, consistently exploring and utilizing comparative advantage, and by redistributing human resources and capital to a more productive sector with a great flexibility. If not the world market, the economy of Korea would have taken a totally different form and its productivity would have remained at a very low level.

The development strategy of intensive intervention of the government into the economy resulted in many side-effects, which include over-investment in the heavy chemical industry, the centralization of economic power in the financial industry, price uneasiness, and labor suppression. Moreover, the expectation that the government would not let an enterprise fail, which meant forming a risk sharing body, extensively increased the moral hazard of companies. The problem was not fundamentally resolved even in the 1980s and, at last, contributed to the economic crisis at the end of the 20th century.

After the crisis, the government implemented various plans to introduce advanced economic market system, while actively settling the issue of insolvency. It also aimed for improving corporate governance and strengthening financial inspection and social safety net, while pursuing extensive deregulation in each sector of the economy. It contributed to re-establishing the relationship between the government and the market and building the foundation for a more sustained economic growth and social development. On this basis, the Korean economy was able to overcome the global economic crisis in 2008 without much difficulty.

The economy of Korea now faces a variety of structural problems. To solve these problems, more efforts should be invested into stabilizing its macroeconomic environment such as strengthening a market order, improving its institutions and policies, and accelerating social cohesion. The economic growth with a focus on the market does not imply the principle of laissez-faire, and in some cases, it requires more rigid restriction of the government. Especially, stimulating competition between suppliers, applying anti-trust laws more strictly, and protecting consumers are the activities, which a government should consistently practice. Moreover, the information on suppliers should be provided to consumers and, if necessary, a government should produce such information or directly provide it to customers. Also, a government has to reduce blind spots of social security, improve its effectiveness, and stimulate the participation of vulnerable social groups in the labor market. Lastly, there is a need to expand the educational opportunity for the low-income class. For sustainable economic development, it further requires a comprehensive approach that calls for a closer cooperation among government ministries and institutions and efforts which transcend the barriers between the private and the public sector.

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