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**Chapter 7
Basic Principles of Industrial Economics and
Industrial Policies**

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Introduction

From the experiences of economic development through the use of industry as the primary mechanism, as exemplified in the cases of Japan, South Korea, and Taiwan, it is clear how the role of government in managing and intervening in the economy to enable the targeted industries to grow and achieve competitiveness on the international stage has been highlighted. However, these roles, when viewed from an economic theory perspective, can be analyzed through various conceptual frameworks and lead to conclusions, including policy recommendations that encompass different approaches.

In the first part of this chapter, we will present the concept of industrial policy from the perspective of Dani Rodrik, an American economist from Harvard University. While in the second part, we will introduce the views of industrial policy and government intervention by Justin Lin, a Chinese economist and former Chief Economist of the World Bank, and Ha-Joon Chang, a South Korean economist from Cambridge University. They share both common and distinct perspectives on the formulation of industrial policies for governments.

7.1 Fundamental Concepts of Industrial Policy

7.1.1 Information externalities

According to the concept proposed by Rodrik (2014), the development of innovation and diversity in production structures depends on the ability to "discover" the demand for goods and the cost of producing these goods within the economic system. In other words, it can be discovered whether a new economic activity can be produced using appropriate costs and with sufficient benefits.

In the competitive business market of a free-market system, if entrepreneurs face failure, they must bear all the costs. If successful, they must share some of the value of their discoveries with other producers, enabling these producers to imitate new production processes and enter the market in large numbers. Therefore, entrepreneurs within such a market structure are both full cost bearers in development and creators of new economic activities that benefit society as a whole. Hence, it is not surprising that low-income countries lack entrepreneurs who focus on research and development to independently discover new economic activities.

However, the best policy to address information externalities is to subsidize investments in new-format industries. Nevertheless, such subsidies can

be challenging to implement in practice because there may be errors in policy formulation.

7.1.2 Components of Institutional Structure

The development of innovation and incentivizing private sector involvement in industrial development through government-defined industrial policies (as seen in the case studies of Japan, South Korea, and Taiwan) comprises important components in various structures, including:

- (i) The significance of political leadership, which should play a clear role and set a well-defined vision for long-term industrial development.
- (ii) Mechanisms for fostering collaboration and consultation among various sectors.
- (iii) Mechanisms for transparency and accountability.

7.1.3 Ten Fundamental Principles for Designing Industrial Policies

From the experiences of countries that have used government policies as a guiding framework to promote industries, particularly in selecting target industries to elevate the nation's potential, policymakers should emphasize the following:

1. Incentives should be provided exclusively for new-format economic activities.
2. There should be clear criteria/standards for measuring success and failure.
3. It is essential to have regulations that define the end of support for new economic activities (built-in sunset clause).
4. The focus of support should be on specific industries, not industries as a whole.
5. Supported activities should have a clear potential to create positive information externalities.
6. Empower government agencies with the ability and efficiency to drive industrial policies.
7. Government agencies responsible for pushing industrial policies should be closely monitored by the highest political authorities and be cautious regarding the potential mutual interests with the outcomes of those policies.
8. Government agencies pushing industrial policies should maintain open and regular communication with the private sector or collaborate with them in a transparent and consistent manner.

9. Eventually, some failure of industrial policies must occur, leading to the decision to "pick the losers," which the government must accept as part of the potential errors.
10. Policy implementers must have the capability to adapt and improve policy approaches continuously to ensure the innovation development process continues without interruption.

7.1.4 Patterns of Policies for Fostering Innovation

In addition to the theoretical foundations and basic characteristics of industrial policies as presented earlier, industrial policies should consider the following points. This is to ensure that not only new industries are emphasized but also that innovation development goes hand in hand. This approach will lead to the continuous development of newly emerging industries, ensuring long-term sustainability in a country's potential:

1. Emphasize support for the costs of "innovation discovery," which focuses on research and development in target industries.
2. Develop mechanisms for providing special financing for high-risk economic activities, which will help spread risks and mitigate the potential impact of failure.
3. Address the issue of positive information externalities cooperation, which identifies clear positive information externalities that occur in specific industries and products and design mechanisms to address these issues.
4. Support the enhancement of technical skills of the workforce, as skill development is crucial in elevating the industry. Training and skill development programs must be designed to continuously improve skills and align them with new technologies and innovations that the government has targeted.
5. Utilize skilled labor or experts living abroad, taking advantage of their expertise in foreign countries. In this case, it involves incorporating knowledge and skills from expatriates, encouraging them to return to their home country to contribute to the development of technology and innovation. This has been a significant case in countries like South Korea

7.2 Debate between Justin Yifu Lin and Ha-Joon Chang on the Comparative Advantage vs. Competitiveness

Box 7.1: Professor Justin Yifu Lin



Professor Justin Yifu Lin received his Ph.D. from the University of Chicago and served as the Vice President and Chief Economist of the World Bank from 2008 to 2012. Before that, Professor Lin held the position of Director and Professor at the China Centre for Economic Research at Peking University in China. He has authored 16 books and, in 2007, delivered the Marshall Lectures at the University of Cambridge on a topic related to the debate, which was published under the title "Economic Development and Transition: Thought, Strategy, and Viability" by Cambridge University Press in 2009.

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Box 7.2: Associate Professor Ha Joon Chang



Associate Professor Ha-Joon Chang is a faculty member in the Department of Economics at the University of Cambridge. He has written articles on various economic topics and authored books such as "Kicking Away the Ladder: Development Strategy in Historical Perspective" (Anthem Press, 2002) and "Bad Samaritans: Rich Nations, Poor Policies, and the Threat to the Developing World" (Random House, 2007).

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From the articles by Chang (2009) and Lin & Chang (2009), they present interesting points related to the fundamental concepts of industrial policy and guidelines for policymakers when choosing target industries, covering the following critical issues.

7.2.1 Professor Justin Yifu Lin's Perspective

The key problem in market failure is the issue of vital external information or the dissemination of information that developing countries cannot afford to overlook. It leads to exclusion from the market due to such failure. Innovations that occur, whether successful or unsuccessful, can provide information about market opportunities, both profit-generating and non-beneficial ones. However, since this information is available to innovators, competitors, and imitators without incurring any cost, it tends to decrease incentives for new innovations.

Hence, government support becomes one of the mechanisms for stimulating innovation and compensating for the first-mover disadvantage. Another aspect of market failure is the lack of coordinated investment, where developing countries lag behind in technology, industry structure, human capital, infrastructure, and institutions compared to developed countries. Therefore, for developing countries to progress in industry and technology, significant changes are required, not just in technology but in more complex aspects. This includes the need for increased capital, production scale, market size expansion, and synchronous market integration within a given timeframe.

Nevertheless, it is impractical for each company to efficiently facilitate the entire transformation, and coordinating such changes between companies is often unfeasible. Hence, the government must take the lead in driving or orchestrating these changes. In these cases, the positive externalities of market entry and experimentation by companies and the need for coordination are indicative of government intervention. This intervention can be conducted in a manner consistent with neoclassical economic theory.

Moreover, the reality is that the pressure for such interventions has diminished due to the high risks associated with government failures. However, fear of having an inefficient government does not absolve us of the responsibility to attempt to design effective strategies to promote development. In the past few decades, there are a few successful examples of governments that have grown rapidly when they have effectively led, even in a purely laissez-faire approach without attempting to address market failures. There are many other instances of efficient government-led growth in a purely laissez-faire approach.

Therefore, it is the responsibility of policymakers to identify the most efficient ways to promote production and necessary structural changes. The most critical aspect of the industrial structure is the presence of an endowment structure within the country, encompassing the readiness of labor, skills, capital, and natural resources. To elevate the industrial structure, there must be an enhancement of existing resource structures; otherwise, the emerging industrial structure may impede development. The role of a facilitating government is to encourage the establishment of companies and industries that will effectively utilize their comparative advantages. In the application of these policies, the government should ensure necessary coordination to eliminate barriers to the emergence of companies and industries. Furthermore, the state should provide assistance to overcome external impacts. However, then it should allow entrepreneurs to grow and develop naturally, as they leverage their comparative advantages. When industries and competitive companies grow, they seek larger market shares and create the maximum economic surplus in the form of profits and wages. Reinvesting these surpluses results in the highest possible returns, as long as the industrial structure is well-suited to the resource endowment structure.

As time progresses, this strategy will help the economy accumulate physical and human capital, elevate the existing resource structure, and enhance the competitiveness of domestic industries and companies in products that require high capital and skills. While comparative advantage may appear to change gradually, in reality, progress accelerates due to technological readiness and the development of industries that are ahead of countries.

In each stage of development, companies in developing countries can adopt technology and enter industries that align with their resource endowment more effectively than creating new innovations from scratch. This ability to leverage existing technologies and enter established industries results in GDP growth rates of 8% to 10% for some countries in the group of emerging industrial nations in Asia.

The industrial strategy employed by developing countries in the 1950s and 1960s introduced a new approach to development, distinct from the cases of the United States and Europe. These countries emphasized heavy industries that required significant capital, which utilized factors they lacked, while often neglecting many of their abundant resources. This led policymakers to structure their industries more based on external influences rather than genuine economic characteristics.

Within this framework, challenging comparative advantage and incurring high financial and regulatory costs became a necessity. To execute this strategy,

governments had to provide protection and crucial support to companies unable to compete effectively. Without such government support, these firms would not compete globally rapidly, and they would fail to create genuine surplus for society without continuous surplus circulation. Raising capital and skilled labor, particularly needed for achieving advanced industrial structures, becomes more challenging in the absence of continuous surplus circulation.

Additionally, by distorting market signals and shifting resources from competitive sectors to non-competitive ones, high-level protection and support tend to slow down the accumulation of physical and human capital within a country. Moreover, if companies are encouraged to transition from being efficient entrepreneurs to rent seekers, it can hinder capital accumulation over time. Consequently, instead of the government acting as the "midwife of industries," there is a tendency to become the "nurturer" of new industries. This may lead to long-term challenges in terms of international competitiveness and development capacity.

The culture of seeking rent that tends to become a defensive fortress can make future reforms more difficult. Designating companies within a country to operate based on their comparative advantage may seem reasonable, but using comparative advantage as the primary strategy, as proposed by Michael Porter (1990), has four key components:

1. Sectors and industries that heavily utilize the available factors within the country.
2. Large domestic markets so that companies can achieve scale.
3. Industrial clusters to foster production networks.
4. Fair competition within the country to promote efficiency and growth in production.

In this context, when considering domestic competition, if a country's strategy conflicts with comparative advantage, it generally becomes ineffective in the long term. This is because companies without the capacity tend to demand protection. Additionally, creating and maintaining industrial clusters can become challenging if the government does not provide financial support and protection to various companies entering these industries simultaneously. Furthermore, the size of the domestic market is not a significant factor in this case, as industries and companies can export and compete globally. As a result, the four requirements reduce to only one, which is to use comparative advantage effectively.

Therefore, the government plays a role in promoting technology and upgrading industries but faces the risk of deviating too far from a country's true comparative advantage. The critical point lies in defining the "deviating too far,"

which requires data and theoretical analysis to be applied in the specific context of the country. Professor Ha-Joon Chang provides reasoning that fundamental concepts in various economic theory aspects, such as factors of production movement, technological development, protection of emerging industries, and international trade (e.g., Baldwin, 1969), may not be sufficient for policy formulation to help a developing country advance its industries.

However, it is clear that there are challenges in labor market adjustments to changes in industrial competitiveness. Physical capital is often limited as it includes machinery and facilities specific to industries. Labor cannot easily move from one industry to another or from one region to another without incurring costs. Physical capital may also have limitations in relocation or repurposing for use in other industries. Nonetheless, when a country loses its comparative advantage in existing industries, industry-specific capital can be moved through foreign direct investment (FDI) into other countries. This leads to an economic development pattern similar to the "flying geese" in East and Southeast Asia.

Due to significant cost reductions in information and transportation, in different stages of development, countries can focus on different segments of the same industry. Each country uses different technologies and produces different products based on their comparative advantages. For example:

- High-income countries like the United States specialize in research and development of products and technologies.
- Upper-middle-income countries like Malaysia emphasize computer chip manufacturing.
- Middle-income countries like China focus on producing components and final products.

On one hand, it is challenging to argue that industrial policies and trade policies with significant government involvement have greatly facilitated economic growth in South Korea. South Korea has protected target industries with high trade barriers and, in some cases, adopted an interventionist approach to upgrading industries towards capital-intensive sectors. Over the past 40 years, South Korea has achieved exceptionally high GDP growth rates and serves as an example of upgrading various industries, such as the automotive and semiconductor sectors.

Through past development efforts, South Korea has propelled itself into a comparative advantage. For example, in the automotive industry's early growth phase, South Korean producers mainly focused on assembling imported components, relying on a labor-intensive approach consistent with comparative advantage at the time. Similarly, in the electronics industry, they initially emphasized consumer appliances like televisions, washing machines, and

refrigerators. Once excelling in these areas, South Korea transitioned to prioritizing memory chips, the least technologically complex part of the data industry.

What is highly significant is that South Korea has managed companies that receive government protection, placing them under market discipline. This ensures that they cannot deviate from the comparative advantage of the economy. Industries benefiting from South Korean government protection and support must prove their competitiveness in export markets over time. Furthermore, the government has made substantial efforts to ensure that South Korean producers can access intermediate production factors at prices competitive with their competitors, often through tax breaks, tax exemptions, and the establishment of export processing zones.

Therefore, the South Korean government acknowledges the importance of comparative advantage and successful technological upgrading depends on companies influenced by global prices, both in terms of production factors and final products. Most analysts suggest that the South Korean government functions as a "facilitator of convenience." When the government chooses to protect or incentivize firms in target sectors that can be competitive in the long term (over 20 years or more), it must draw resources from existing firms in areas with inescapable comparative advantages.

However, excessive protection and support risks fostering a rent-seeking culture because the quality of institutions and governance is crucial for development. The indirect consequences of providing protection or incentives through inadequate regulation can be far more damaging to the economy in the long run than the direct impacts of fostering such industries.

7.2.2 Professor Ha-Joon Chang's Perspective

What makes some countries develop while others do not is their differing technological capabilities. Ultimately, countries that have developed continuously are those that can improve and the ones that remain underdeveloped. This is due to their varying technological development abilities. Less developed countries may face difficulties in progressing because they have different technological abilities. It is clear that Professor Ha-Joon Chang is right when he suggests that we must avoid excessive deviation from the idea of Comparative Advantage. Deviating too much from Comparative Advantage means paying more to acquire new capabilities. In Professor Chang's theory, Comparative Advantage serves as a useful guideline for determining how much a country is losing when protecting and promoting industries. In the long term (20 years or

more), the government must extract resources from industries with genuine comparative advantages to avoid irreparable damage.

However, this does not imply that any country should strictly adhere to Comparative Advantage, as Professor Chang mentioned. From the history of technological development, technological leapfrogs or disruptions have occurred multiple times, contradicting the concept of Comparative Advantage. According to the classic Comparative Advantage theory, as used by Professor Chang, problems related to moving production factors might not be accurate concerning real-life situations in many countries. This leads to inaccurate estimations of a country's development potential, resulting in misguided development policies. Furthermore, technological capabilities, acquired through industry experience in production processes, distinguish developed countries from developing ones. These capabilities are critical for creating comparative advantages, especially when a country is transitioning into new industries and upgrading its industrial structure.

The impact of such development has successful examples, such as Toyota, Samsung, TSMC (Taiwan Semiconductor Manufacturing Company), and many other companies in various countries that benefited from the government's protection and support in different industries. Furthermore, the challenge of deciding to deviate from Comparative Advantage is a crucial issue. In countries like South Korea and Finland, they succeeded because they did not deviate too far from Comparative Advantage. According to Professor Lin Yifu, the development ladder of the South Korean economy is often carried out efficiently through the stages. Therefore, although not entirely agreeing with this point (e.g., moving into the steel and shipbuilding industry is a significant leap, with almost no intermediate stages), it is acknowledged that jumping too far can result in excessive learning costs. For this reason, it can be assumed that there is a U-shaped relationship between the economic deviation from Comparative Advantage and the economic growth rate. That is, if the deviation from Comparative Advantage is too small, it may be efficient in the short term, but long-term growth will slow down as there is no industry upgrade. At one point, the increase in deviation from Comparative Advantage may accelerate growth. However, the negative effects of protection (e.g., excessive learning costs and rent-seeking) may suppress the growth of new industries, resulting in overall negative growth.

The numbers that Professor Lin Yifu mentioned are calculated based on the Purchasing Power Parity (PPP), which often estimates the income of developing countries higher than reality. If we use the current price basis, we can see that in 1960, Finland's income per capita was only 41% of the United States

(e.g., \$1,172 compared to \$2,881). This means that Finland did not deviate too far from Comparative Advantage, as Professor Lin Yifu mentioned. However, Finland achieved significant success in building Nokia.

In the case of Japan, in 1961, Japan's income per capita was 19% of the United States (e.g., \$563 compared to \$2,934). At that time, Japan protected and promoted various industries, including automobiles, steel, shipbuilding, and more. In the case of South Korea, they established the state-owned enterprise POSCO in 1968 to build a steel plant, which began production in 1972. As a result, South Korea's average income per capita was only 5.5% of the United States (e.g., \$322 compared to \$5,838) in the same year. South Korea made the decision to deviate from Comparative Advantage by opening heavy industry and chemical industries, which led to shipbuilding, automobiles, machinery, and other industries. Even in 1983, when Samsung decided to design its own semiconductors, South Korea's average income per capita was 14% of the United States (e.g., \$2,118 compared to \$15,008).

It can be observed that the governments of Finland, South Korea, and Japan all deviated from the principle of Comparative Advantage. They provided support to capital-intensive industries during times when their countries had low income or no comparative advantage.

7.2.3 Common and Different Perspectives

Ha-Joon Chang and Lin Yifu share a common understanding on the main issue that countries should deviate from Comparative Advantage to boost their economies. However, they differ in the extent to which they believe such deviation is appropriate. They both agree that countries should deviate from Comparative Advantage to upgrade their economies, but Lin Yifu suggests that the deviation should not be too significant, while Ha-Joon Chang believes that, based on the cases of several countries, governments can adopt policies that deviate more from the neo-classical theory.

Nevertheless, Lin Yifu has strong faith in neo-classical economics and thus concludes that countries with incomes as low as 5% of developed countries have almost no chance of entering capital-intensive industries (e.g., like South Korea did with the steel industry) if they strictly adhere to Comparative Advantage. In contrast, Ha-Joon Chang believes that we cannot fully understand the history of success of each country if we are anchored to the neo-classical framework in analyzing Comparative Advantage, as Lin Yifu does.

Summary

The development of industries began with the Industrial Revolution in the United Kingdom and subsequently led to industrial development in other European countries and the United States, resulting in an increase in the average income of their populations. However, the industrial development of Asian countries like Japan, South Korea, and Taiwan has followed a different pattern compared to European and American nations. These Asian countries have clear targets for their industries and emphasize government intervention to rapidly create new industries with international potential.

Dani Rodrik (an American economist from Harvard University) defines that government industrial policies are primarily driven by the need to address information externalities in the market, particularly in the creation of innovations. When innovators bear all the costs of developing innovations and their successful entry into the product market sends a signal to other potential imitators who can copy the product at reduced risk and cost, entrepreneurs may be discouraged from entering new industries or developing innovations. This is a challenge that government policies can address by providing support to entrepreneurs, encouraging them to venture into new industries or develop new innovations. In the case of the mobile phone market, it is clear that Apple pioneered the development of new mobile phones within the United States' economic system. The government did not have industrial policies or market intervention (Apple invested in innovation and bore the losses if unsuccessful). On the other hand, Samsung, with continuous government support, rapidly entered the mobile phone market and became a significant competitor. Therefore, it is a clear case of how different countries have different approaches to industrial policy.

Furthermore, Lin Yifu (a Chinese economist and former Chief Economist of the World Bank) and Ha-Joon Chang (a South Korean economist from the University of Cambridge) exchanged views and had similar perspectives. They both agreed that industrial policies are essential to address information externalities. Additionally, they emphasized the importance of targeting specific industries and promoting the development of new industries in a country.

However, Lin Yifu suggested that governments should choose industries based on the principle of Comparative Advantage. This approach involves developing industries that build upon the existing advantages of the country, allowing for the selection of new industries within the framework of Comparative Advantage.

On the other hand, Ha-Joon Chang proposed that the cases of Finland, Japan, and South Korea demonstrate that the development of industries did not strictly follow Lin Yifu's ideas. These countries chose new target industries that did not have a comparative advantage, and yet they succeeded in developing these industries and raising their income levels significantly. Therefore, the theories, particularly those following the Neo-Classical framework proposed by Lin Yifu, may not always align with the actual success of industrial policies in different countries

Bibliography

Chang, H-J. (2009). Industrial Policy: Can we go beyond an unproductive confrontation? Paper for the Annual World Bank Conference on Development Economics.

Lin, J. & Chang, H-J. (2009). Should industrial policy in developing countries conform to comparative advantage or defy it? A debate between Justin Lin and Ha-Joon Chang. *Development Policy Review*, 27(5), 483-50

Rodrik, D. (2004). Industrial Policy for the 21st Century, paper from JFK School of Government, Harvard University.