



**EE482 Industrialization: Role of Public and Private
Sectors (Section 046401)
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**Chapter 8
Industrialization and Structural Transformation**

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Introduction

Economic development has been closely linked to progress, as demonstrated in Chapter 1, which presents the economic history. It is evident that the elevation of average income and the expansion of GDP began to occur after the industrial revolution. Therefore, the content of this chapter focuses on studying the details of the increasing patterns of industrial activities concerning economic expansion. The initial part of the content presents an intriguing perspective on the comparisons between Japan and Argentina. These two countries have significantly different development patterns since World War II, including Argentina's continuous economic decline and reduction from a developed to a developing country—a unique case in contrast to the economic development of countries in East Asia.

The following section analyzes data from various countries globally to study the relationship between the proportion of industrial activities and the average population level. Furthermore, adjustments to the data patterns reveal different relationships between the early development cases (European and U.S. groups benefiting from the first unbundling) and countries in Asia that uplift themselves through industrial development (mostly benefiting from the second unbundling). Additionally, the analysis presents the mechanism of expansion in the economic system and the benefits arising from the expansion of industrial production, a pattern distinct from the agricultural and basic service sectors.

In the final part of this chapter, we present a case study on the problems arising during the industrial development process. This includes the characteristics of obstacles or slowdowns in industrial development and the patterns of reducing the role (or regression) of the industrial sector in the economic system. This case requires careful consideration when formulating economic policies.

8.1. Simon Kuznets and the 4 Types of Countries in the World

Professor Simon Kuznets, who was awarded the Nobel Prize in Economics in 1971, stated that the world is divided into four types of countries:

- (1) Developing countries
- (2) Developed countries
- (3) Japan
- (4) Argentina

The remarks by Professor Simon Kuznets have generated significant interest in the field of economics, especially in the cases of Japan and Argentina. These two countries are particularly exceptional cases for studying economic development patterns.



Figure 8.1: Professor Simon Kuznets

Source: commons.wikimedia.org

Analysis from The Economist (2014) and The Economist (2019) has presented a historical comparison, indicating that Argentina has been able to maintain a continuous GDP growth. During the period of 1871-1914, Argentina experienced the highest growth in the world, with an average GDP growth of 6% in 1914. The population in the capital city (Buenos Aires) consisted of 50% immigrants, mainly from Europe. Argentina was considered one of the wealthiest countries globally, ranking higher than France, Italy, and Germany. The average income of the Argentine population was 92% of the average of the top 16 highest-income countries in the world. Currently, this proportion stands at 42%.

Both Japan and Argentina have unique characteristics that have consistently attracted economists' attention. In 1950, Argentina's average income per capita was three times that of Japan. Even after World War II, Argentina's foundation provided aid to Japanese citizens facing food shortages and necessities for survival. This aid included sending over 100 tons of food and various materials. Additionally, more than 23,000 Japanese people relocated and changed their citizenship to become Argentine citizens in the 1960s. However, after 1960, the economic development paths of the two countries diverged significantly. Japan rapidly developed its industry and became a high-income country by 1967.

Currently, the average income of the Japanese population is twice that of Argentina.

In February 2019, Argentina experienced an inflation rate of 50%, while during the same period, Japan had an inflation rate lower than 0.2%, and at times, even negative. Japan has faced the dual challenge of low unemployment and low inflation for over two decades. Meanwhile, in the third quarter of 2018, Argentina encountered a 6% contraction in GDP compared to the same quarter in 2017. Japan has had a trade surplus for the past 40 years, while Argentina has experienced trade deficits during the same period. Argentina's savings rate is only 17% of GDP, insufficient for long-term development and economic growth. Japan, on the other hand, has a high savings rate, especially in the business sector, with accumulated profits in deposit accounts and financial assets in significant quantities. However, there is a lack of motivation for investment to expand operations in both countries, posing economic challenges that economists continue to grapple with.

2. Industries are the main engines of economic development and the standard model for industrial development

2.1 Industrialization as an engine of growth

Examining the evolution of economic systems and technological advancements, particularly in textile production and the utilization of steam power in manufacturing in 18th-century England, marked the beginning of economic development. Subsequently, in the 19th century, it was defined as Industrial Revolution and spread to many European countries. Since World War II, industrial activities have gradually become the primary activities in many developing countries, alongside the expansion of international trade and cross-border production processes. This trend, mostly rooted in the division of labor during the late 19th century, is exemplified in the concepts of the first unbundling and second unbundling, as presented in Chapter 1 of this course.

This pattern aligns with the characteristics of the first unbundling and second unbundling processes, influencing the economic structure, societal structure, and even changes in governance systems. Many countries have utilized the second unbundling to their advantage in economic development, rapidly raising the income levels of their populations and enhancing competitive capabilities. This has led to changes in income status for several countries, moving them from low-income to middle-income, and some have even ascended to high-income status. Throughout the period from 1950, there have been developments that enabled countries to transition from low-income to middle-income and, for some, to high-income status. These developments have resulted in the rapid improvement of

competitive abilities. This entire process, known as "catch-up," has occurred through industrial development and the reduction of the role of agricultural or natural resource-exporting activities.

Although the data depicting the economic structure of countries capable of catching up to those that have already developed, particularly the G7 countries, clearly shows that the industrial sector has replaced the agricultural sector, resulting in an elevation of the average income of the population and the development of labor efficiency, the aforementioned pattern does not imply neglect or lack of importance for the agricultural sector or the production of other basic natural resources. On the contrary, a strong and efficient foundation in agriculture or the production of basic natural resources is crucial. It serves as a significant foundation for sustainable industrial development because the agricultural sector and basic natural resource production must have the capability to meet the country's basic needs to ensure the continuous operation of industrial processes.

Furthermore, the service sector, especially the financial and transportation sectors, plays a vital role in the development of high-level industries. Therefore, industrial development must consider creating balance in all aspects, particularly in the development of agriculture (including basic resource production) and the service sector, to ensure efficiency concurrent with industrial development. After World War II, countries that could expedite the development process to catch up stimulated GDP growth at rates ranging from 6% to 11.5% per year. This led to an average per capita income growth of 5-9% per year, unprecedented in economic history. The crucial element in this development process is the emphasis on making the industrial sector the main engine of the economic system to generate production growth and expand exports, as well as to increase employment opportunities.

It is interesting to note that in most developing countries, the agricultural sector contributed an average of 40% to GDP in 1950, decreasing to 16% in 2005. Simultaneously, the service sector also accounted for 40% of GDP in 1950. Therefore, it is evident that the industrial sector in the early stages after World War II had the smallest share in GDP. The success factors for many Asian countries in post-World War II development were the focus on industrial development as the main mechanism of the economic system. In contrast, Latin American countries and some African countries experienced a process opposite to industrialization, known as deindustrialization.

Furthermore, a noteworthy observation is the decline of the industrial sector in Latin America from 24% to 18% of GDP. This occurred concurrently with a slowdown in the growth of average income per capita. For developed countries,

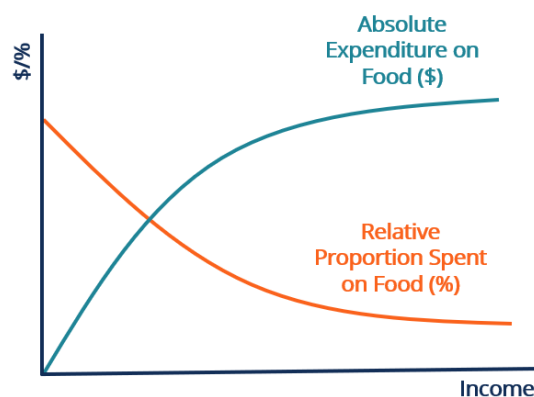
the industrial sector reduced from 31% in 1945 to 17% in 2005, while the service sector's share increased from 43% to 70% of GDP during the same period.

From the analysis of these structural changes, important points about the mechanism of industrial development affecting economic growth can be summarized as follows:

1. Statistical analysis of global data using analytical tools reveals a statistically significant correlation between industrial development and the increase in average national income.
2. Case studies of successful development countries show that the efficiency of industrial production, labor migration, and the movement of other resources (such as land) from agriculture to industry are essential factors. This process leads to the most efficient utilization of resources and affects the overall production efficiency of the country.
3. The analysis indicates that premature deindustrialization, where labor or other resources move from industry to services before reaching high-income levels, results in a slowdown in overall labor efficiency and a decrease in the growth rate of average income per capita.
4. One crucial mechanism for continuous long-term growth, stemming from industrial development, is capital accumulation. This leads to increased overall production efficiency and labor efficiency, contributing to sustained growth in GDP and per capita income.
5. Industrial development results in economies of scale, leading to efficient use of raw materials and production factors. This is due to continuous reductions in fixed costs as production expands, a feature not readily achievable in agriculture and basic services.
6. The industrial sector stimulates technological development and the dissemination of technology, as well as continuous research and development (R&D), happening at a lower level than in agriculture and basic services.
7. Rising incomes lead to a decrease in the proportion of household agricultural consumption, increasing the demand for industrial goods. This expansion of industrial production, in turn, leads to an increase in household consumption of industrial goods, creating a reinforcing cycle, known as Engel's Law.
8. Industrial expansion has ripple effects throughout the economy through backward and forward linkages, impacting diverse branches of production. Research indicates that knowledge and production technology spill over through backward and forward linkages, contributing to learning and developing the efficiency of producers in both upstream and downstream processes.

Box 8.1: Basic Concepts of Engel' Law**Engel's Law**

The concept of Engel's Law illustrates the transmission of impacts within an economic system through the interconnection of needs. If households have low incomes, they can only afford basic agricultural and essential goods. Consequently, as the average income of the population decreases, a higher proportion of that income is allocated to basic food and necessities. This makes the development of the industrial sector in the country more challenging. Additionally, the slower development of industry necessitates a heavy reliance on imported industrial goods, affecting trade balances, exchange rates, and foreign reserves. This, in turn, hinders capital accumulation. In contrast, developed countries experience rapid expansion of the service sector, explained by the principles of Engel's Law. As household incomes rise, a greater proportion of spending shifts towards the service sector, driving rapid growth in this area. Simultaneously, the proportion of agricultural consumption decreases in comparison to overall household consumption, leading to sluggish growth or constant production levels in the agricultural sector.

**Figure B1: Engel Curve**

Source: <https://corporatefinanceinstitute.com/resources/economics/engels-law/>

8.2 The Standard Pattern of Industrial Development

Industrial development serves as a key mechanism for the economies of countries in East Asia and Southeast Asia. This has led many countries in the region to elevate the income levels of their populations and enhance their

competitiveness continuously. Compared to other regions worldwide, only East Asia and Southeast Asia have maintained the ability to consistently raise the value-added of their industrial sectors, contributing to sustained GDP growth and per capita income over several decades.

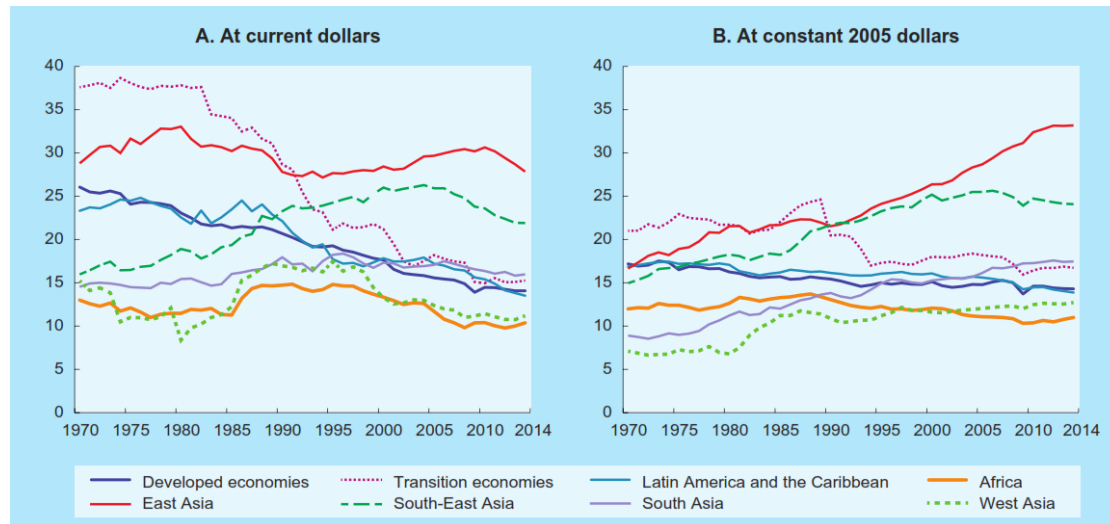


Figure 8.2: *Share of Manufacturing in Total Value Added by Country Groups, 1970-2014*

Source: Dabla-Norris et al. (2013)

This mechanism has enabled numerous countries in East Asia and Southeast Asia to transition from low-income to middle-income status, and some have even achieved high-income levels within a relatively short period (e.g., Japan, South Korea, Taiwan, Singapore, Hong Kong). This characteristic represents an unprecedented phenomenon in the economic history of humankind.

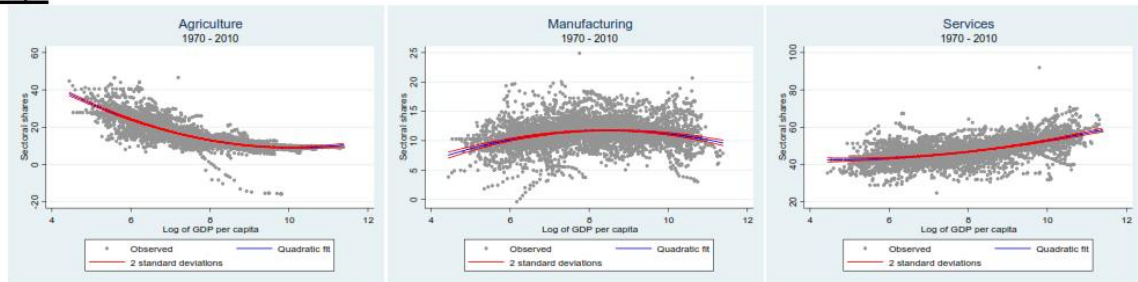
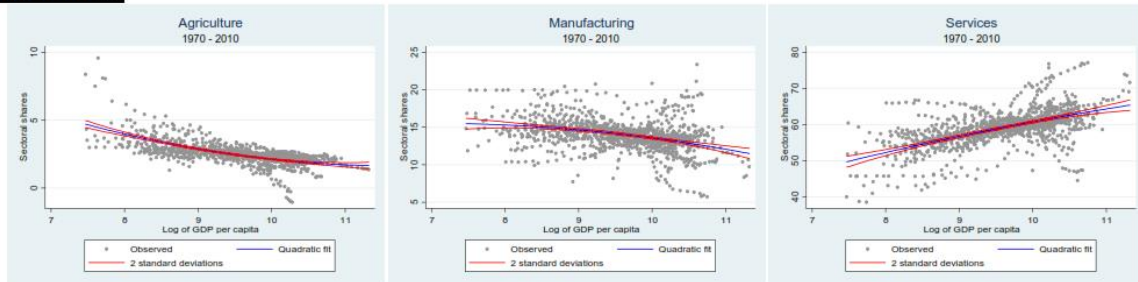
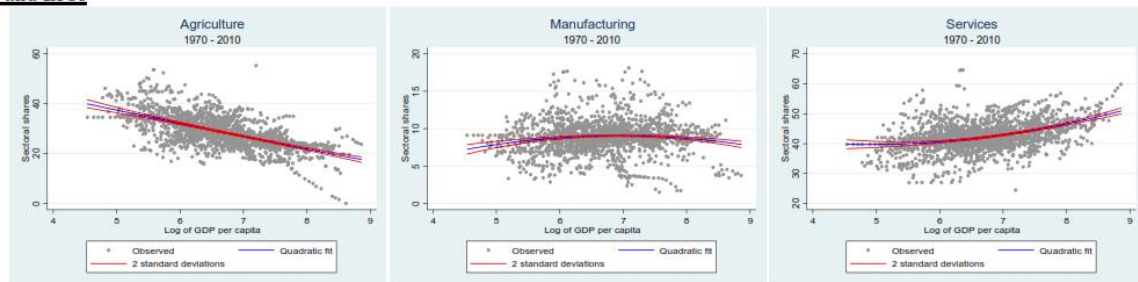
Full Sample**Advanced economies****EMEs and LICs**

Figure 8.3: Proportion of Agriculture, Industry, and Services in Various Country Groups Worldwide Compared with GDP per Capita

Source: Dabla-Norris et al. (2013)

On the flip side, many countries in several regions, such as Latin America or Africa, continue to experience low economic growth and persist with longstanding issues (e.g., high unemployment, inflation, high trade imbalances, and budget deficits). These challenges result from the slowdown or deindustrialization of the industrial sector and a return to reliance on agriculture and natural resources in these respective regions. This hinders their ability to elevate value addition, accumulate capital, and sustain technological advancements continuously. Therefore, the continuous industrial development over several decades becomes a key factor that distinguishes the economic development processes of most countries in East Asia and Southeast Asia from other regions worldwide.



Figure 8.4: Proportion of Agriculture, Industry, and Services in Various Country Groups Worldwide Over the Period 1970-2010

Source: Dabla-Norris et al. (2013)

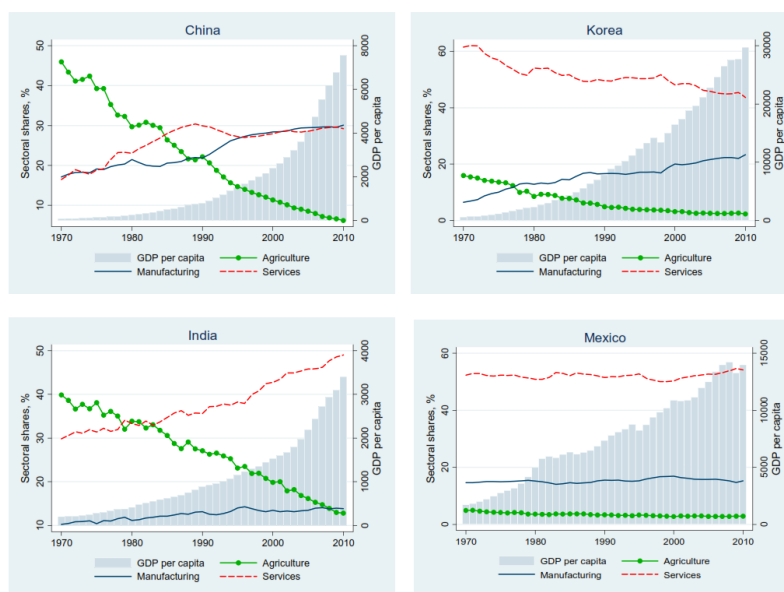


Figure 8.4: Proportion of Agriculture, Industry, and Services in China, South Korea, India, and Mexico

Source: Dabla-Norris et al. (2013)

The industrial development process exhibits a clear pattern when considering global data. The relationship between the proportion of manufacturing value added per capita (Manufacturing VA per Capita) and the proportion of manufacturing value added to total value added (Manufacturing VA per Total VA) follows an inverted U-shaped curve globally. However, this relationship differs across country groups. In the case of new industrialized countries in Asia

and Eastern European countries, the relationship shows a clear inverse parabolic pattern, indicating a positive correlation during the initial stages of industrial development. Both the proportion of manufacturing in total production and the income of the population from the industrial sector increase simultaneously. However, once the threshold of around \$5000 (Manufacturing VA per Capita) is crossed, the proportion of manufacturing in total production starts to decrease.

This pattern is distinct in developed countries, especially the United States and European nations. In these cases, the relationship between the proportion of manufacturing in total production and the income of the population from the industrial sector forms a straight line, indicating a continuous and prolonged positive correlation. This signifies a development process that has been ongoing since the Industrial Revolution, leading to a consistent and long-term relationship.

On the contrary, in other regions of the world, the pattern differs significantly from both of the aforementioned cases. These regions show patterns that differ from the two previous scenarios, both in terms of the low-level development of income from industry per capita and the rapid decline in the proportion of manufacturing value added to total value added. This difference is stark when compared to the cases of newly industrialized countries in Asia and Eastern European countries and the developed Western countries, which have experienced continuous and long-term industrial development.

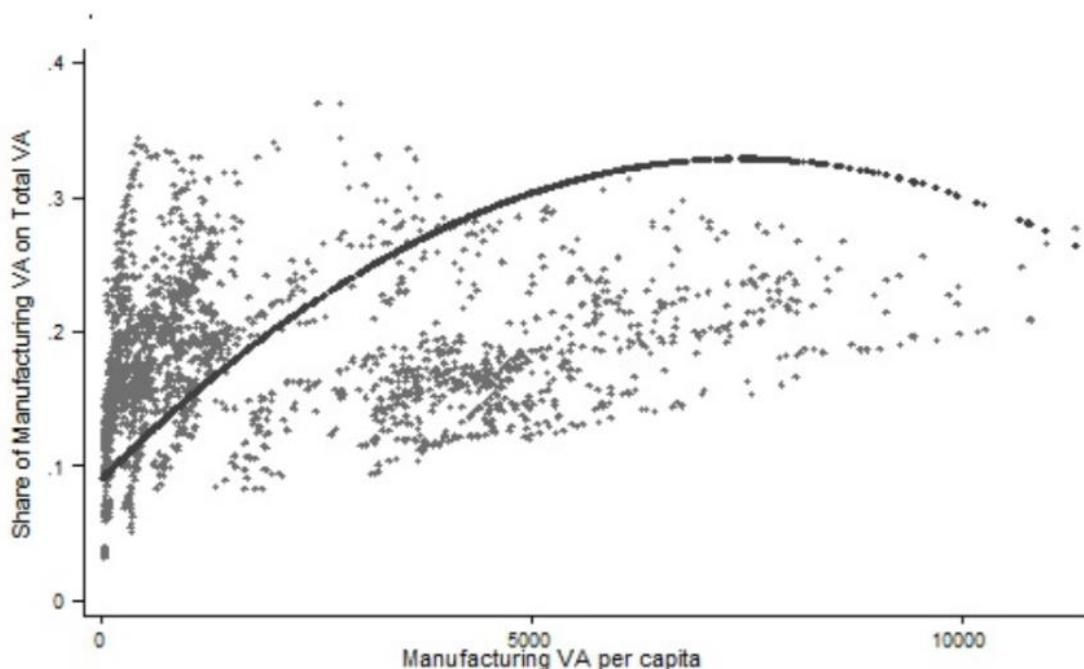


Figure 8.5: The Relationship between the Proportion of Manufacturing Value Added per Capita and the Proportion of Manufacturing Value Added to Total Value Added for All Countries (1980-2011, adjusted to real US\$ values)

Source: Livio & Traù (2017)

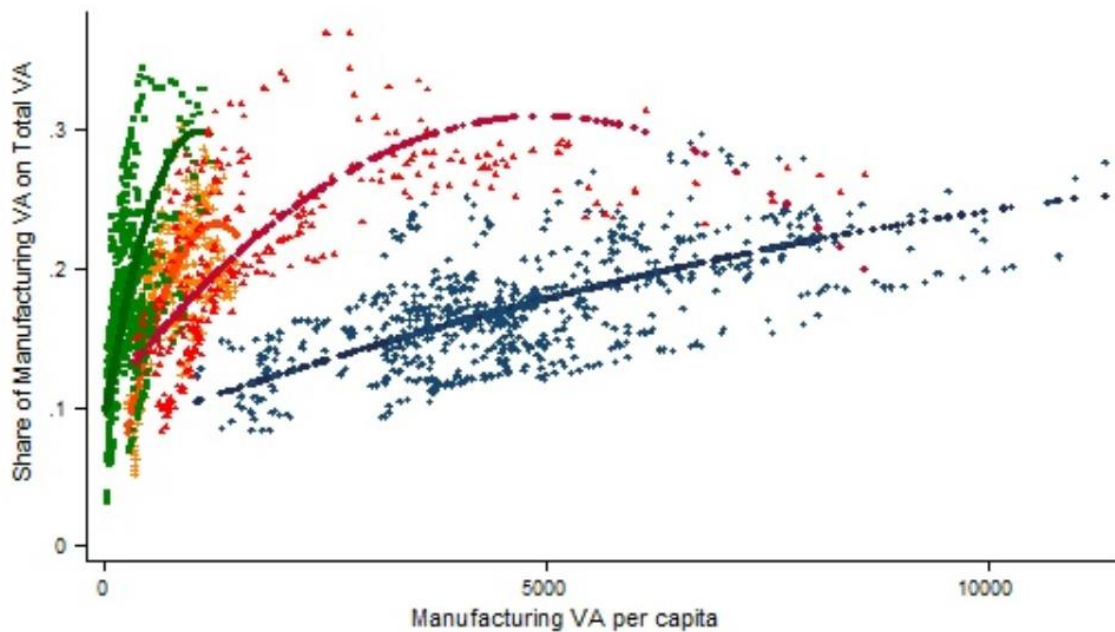


Figure 8.6: The Relationship between the Proportion of Manufacturing Value Added per Capita and the Proportion of Manufacturing Value Added to Total Value Added, Categorized by Country Groups (1980-2011, adjusted to real US\$ values)

Source: Livio & Traù (2017)

The analysis can be adjusted to the form of the relationship between the proportion of Manufacturing Value Added per Capita (Manufacturing VA per Capita) and the concentration of Manufacturing Value Added (Gini Coefficient of Intra-Manufacturing VA). When considering global data, the relationship is a clear inverted parabola. However, when examining country groups, it is evident that the case of newly industrialized countries in Asia and the group of Eastern European countries has the most distinct inverted parabola pattern. This indicates the initial phase of industrial development characterized by the production of undifferentiated goods and a diverse range of industries, primarily agro-processing and natural resource processing.

As these countries progress to a middle-income level, they start selecting industries with potential or targeted industries for development. Once the income reaches a high level, industrial development becomes more diversified, expanding from the base of comparative advantage in specific industries. For developed countries in the West (United States and Europe), the change is nearly linear, showing a slight curvature of a small inverted parabola. This suggests that the process of industrial development and economic structural adjustments in these developed Western countries involves minimal restructuring. The dispersion of industry types continues in a similar manner from low to high income levels. This observation underscores the fact that these developed Western countries have not undergone substantial structural adjustments. The

distribution of industry types remains relatively consistent throughout their development stages, indicating a lack of significant restructuring. Key factors influencing these patterns include global trade processes and the world production network not yet exhibiting the characteristics of the second unbundling.

At the same time, this pattern differs significantly from the case of countries in Asia (including Eastern Europe). These Asian countries have undergone structural adjustments, emphasizing targeted industrialization in the middle stages of development. As income increases, there is a greater dispersion of industries, indicating a more diversified industrial landscape. The process of changing the production structure is rooted in the specialization of specific industrial sectors, fostering international competitiveness. This, in turn, enhances the ability to export, attracts labor and other production factors to the most efficient sectors, and is influenced by the second unbundling.

In other regions of the world, the graph lines still reflect the impact of delays in industrial development, leading to deindustrialization or installment processes. This results in slower economic development and a slower increase in average income per capita. In many countries, this has led to a transition to a pattern of entering middle-income traps.

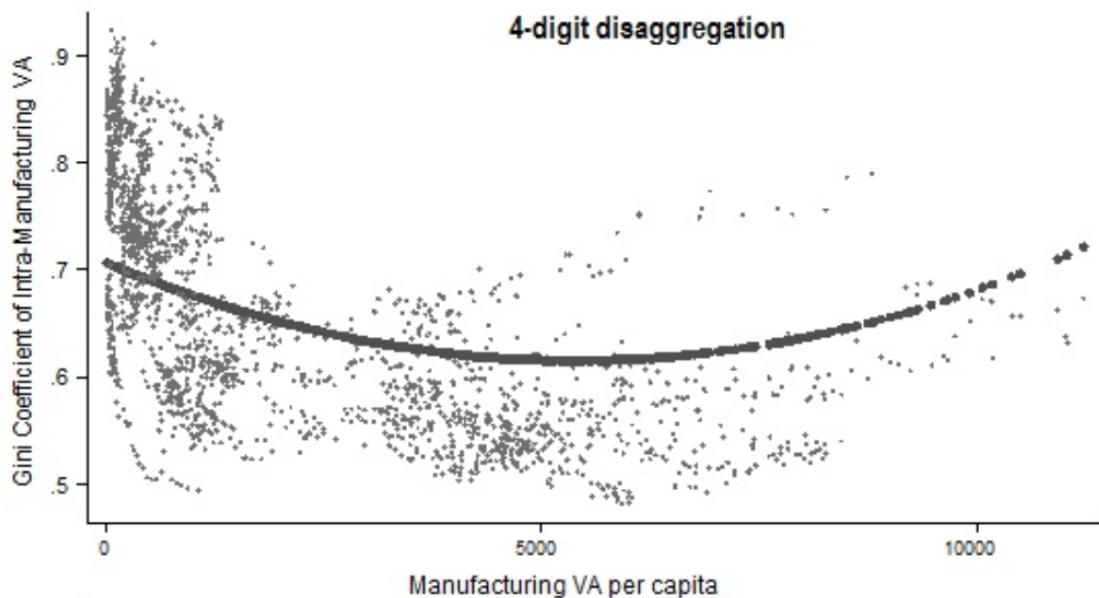


Figure 8.7: The relationship between the proportion of value added in manufacturing per capita and the distribution of types of industries for all countries (1980-2011, adjusted to real US\$ values)

Source: Livio & Traù (2017)

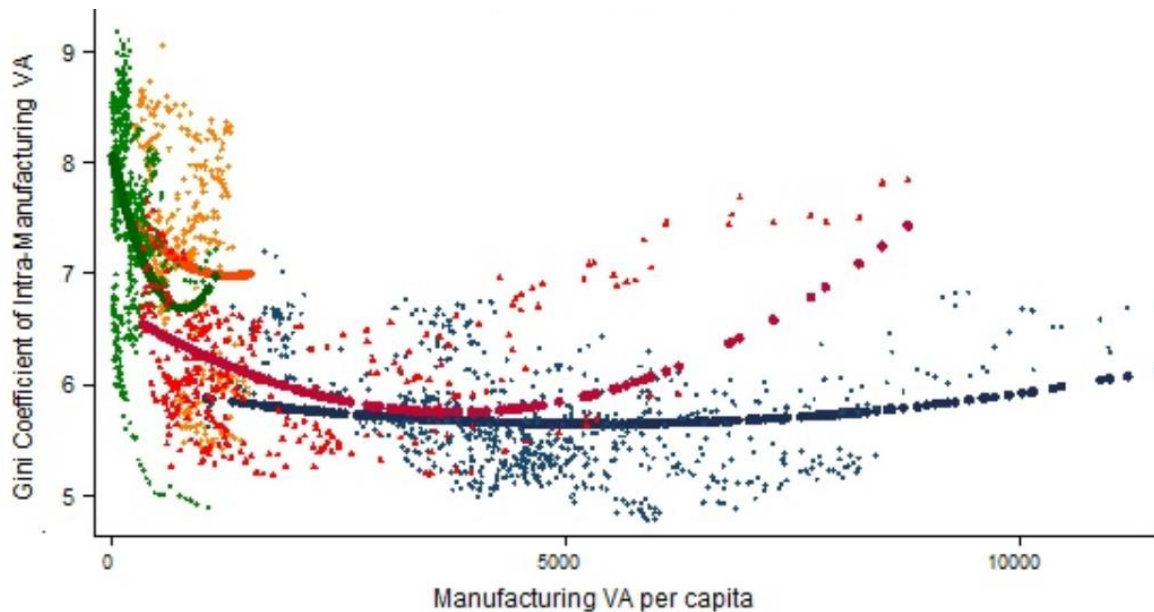


Figure 8.8: The relationship between the proportion of value added in manufacturing per capita and the distribution of types of industries for all countries (1980-2011, adjusted to real US\$ values)

Source: Livio & Traù (2017)

8.3 Installed Industrialization and Premature Deindustrialization

8.3.1 Stalled industrialization

While the expansion of the industrial sector has positive implications for economic development, as clearly seen in the case of East Asia, there are several countries worldwide facing issues related to the stagnation of industrialization, leading to the eventual stall of industrial development.

The transformations observed in India and Mexico are clear examples of stalled industrialization, resulting in a slowdown in industrial expansion and low levels of industrial production and labor hiring. This trend is also prevalent in many countries in Africa, where there is a clear instance of industrial stagnation. In these cases, delayed industrialization significantly impacts the development process, as these countries are still in the early stages, and the stagnation of the industrial sector has long-term consequences due to the lack of essential foundations necessary for continuous industrial development.

A Case of Stalled Industrial Development in India

India is the first country that distinctly illustrates the case of stalled industrial development within the nation. Despite industrial development planning in India starting after World War II, particularly in the 1950s and 1960s, the government promoted the establishment of key industries in the country,

focusing on import substitution. However, the demand for industrial goods produced by these industries was significantly lower than their production capacity. This led to a lack of economies of scale, and these industries were unable to create backward and forward linkages, impacting other sectors and households.

This situation is evident in the proportion of industrial output to total output. In 1970, this proportion was 9.4%, and in 2011, it only increased to 11.6%. This indicates that India's industrial sector hardly grew over a period of more than 40 years.

Furthermore, the share of value added by the industrial sector compared to the overall value added changed only marginally, from 17% to 21%. Employment in the industrial sector also saw minimal changes during the same period. A closer look at specific manufacturing branches reveals that stagnation is primarily observed in major industries, such as textiles and beverages, which are the mainstay of the industrial sector. In contrast, the production of goods utilizing intermediate and advanced technologies, such as electrical appliances, automobiles, and chemicals, showed little change from 1980 to 2014.

Key factors contributing to the limited growth of India's industrial sector include the low domestic demand that hindered the realization of economies of scale. Additionally, the focus on import substitution led to a lack of motivation for exports and integration into global value chains, resulting in low efficiency in production and labor.

	Total value added growth					Industry value added growth					Employment growth				
	1970–1979	1980–1989	1990–1999	2000–2007	2010–2014	1970–1979	1980–1989	1990–1999	2000–2007	2010–2014	1970–1979	1980–1989	1990–1999	2000–2007	2010–2014
Developed economies	4.1	2.7	1.5	3.4	1.2	3.6	2.3	0.6	3.5	0.2	1.0	0.9	-0.1	1.3	0.3
North Africa	6.1	4.5	3.4	4.5	2.4	7.3	4.3	2.9	4.1	1.1	2.8	2.2	2.4	3.3	1.6
Sub-Saharan Africa	5.0	3.5	2.9	5.2	5.6	5.2	3.0	1.7	5.5	6.3	3.1	3.3	2.3	2.3	3.0
South Africa	2.6	1.9	1.5	4.1	2.2	1.4	0.7	0.2	3.2	0.8	0.7	3.0	1.8	1.4	2.8
Latin America and the Caribbean	5.0	0.7	3.5	3.8	3.5	5.6	0.0	3.6	4.0	2.6	3.1	2.8	2.3	2.6	2.1
Argentina	2.6	-1.1	4.9	3.5	3.0	2.5	-2.2	5.1	4.2	1.8	1.4	1.7	1.2	3.2	0.8
Brazil	8.7	2.5	2.1	3.4	2.0	8.9	1.2	1.8	3.0	1.6	4.5	3.7	0.8	2.6	1.2
Chile	2.4	2.7	5.9	4.2	4.3	1.3	3.4	6.3	2.2	3.2	1.2	3.5	2.1	2.5	2.6
Mexico	6.4	1.7	2.9	2.6	2.8	7.1	1.5	3.2	1.7	2.1	5.1	3.3	2.9	1.8	1.5
East Asia	6.9	8.4	5.3	8.7	6.6	9.4	9.2	5.2	10.7	6.3	3.6	2.8	1.5	1.5	1.2
China	4.6	9.4	9.5	10.2	7.7	7.8	9.7	13.0	11.1	8.1	3.4	2.9	1.7	1.5	0.5
Republic of Korea	8.6	8.9	6.2	4.8	3.0	13.0	9.8	6.1	5.9	3.3	3.9	2.8	1.3	1.5	1.8
South-East Asia	7.3	5.4	4.9	5.1	4.8	8.8	5.4	5.3	4.4	3.9	3.6	3.0	2.3	2.3	1.6
Indonesia	7.4	5.4	4.0	4.7	5.6	9.5	5.4	5.3	3.7	4.8	3.7	3.5	2.2	1.5	0.7
Malaysia	8.6	5.6	6.6	4.8	5.2	8.2	6.4	7.1	3.7	4.1	3.8	3.1	3.1	1.8	3.3
Philippines	5.9	1.6	2.9	4.9	5.8	8.0	-0.1	2.2	3.9	6.2	4.0	2.7	2.8	2.8	1.0
Thailand	6.9	7.2	4.3	5.3	2.9	9.1	9.3	5.0	6.1	0.9	1.6	2.6	-0.1	2.1	0.2
South Asia	3.0	4.7	4.8	5.6	5.8	3.9	5.6	5.8	6.8	6.8	1.6	2.9	2.3	2.8	2.0
India	2.3	5.3	5.3	7.0	6.2	3.7	6.7	5.3	8.0	5.1	1.8	3.5	2.4	2.9	1.2

Figure 8.9: Average Growth Rates of Total Value Added, Industrial Value Added, and Total Employment (1970-2014)

Source: UNCTAD (2016)

	Investment growth					Labour productivity growth					Industry labour productivity growth				
	1970–1979	1980–1989	1990–1999	2000–2007	2010–2014	1970–1979	1980–1989	1990–1999	2000–2007	2010–2014	1970–1979	1980–1989	1990–1999	2000–2007	2010–2014
Developed economies	3.4	2.5	2.6	4.8	0.9	3.1	1.8	1.6	2.1	0.8	2.5	2.8	3.1	2.8	1.1
North Africa	11.5	1.1	4.4	6.1	-0.8	3.3	2.3	1.0	1.2	0.8	2.5	2.0	0.6	-0.1	-0.4
Sub-Saharan Africa	4.2	-0.8	1.9	9.1	7.4	1.8	0.3	0.6	2.9	2.3	0.0	-0.2	-0.7	0.5	2.7
South Africa	3.4	-1.5	1.7	9.0	4.0	1.9	-1.1	-0.3	2.7	-0.6	0.0	-1.8	1.7	1.3	-3.8
Latin America and the Caribbean	7.1	-2.8	5.2	5.9	5.4	1.9	-2.0	1.2	1.3	1.5	1.3	-1.7	2.2	1.5	0.0
Argentina	3.0	-7.0	9.7	6.6	2.0	1.2	-2.8	3.7	0.3	2.2	1.7	-1.4	6.9	-0.7	-2.5
Brazil	9.4	-1.6	1.8	2.6	1.8	4.2	-1.2	1.3	0.8	0.8	3.4	-2.8	2.9	0.0	-2.5
Chile	-1.0	4.4	7.3	8.3	5.2	1.3	-0.8	3.8	1.7	1.7	-0.3	-0.5	6.2	0.1	-1.8
Mexico	7.3	-2.7	4.8	3.0	3.2	1.3	-1.6	0.1	0.8	1.3	0.6	-1.7	0.4	0.6	3.7
East Asia	10.4	8.7	6.8	14.1	9.3	3.0	6.3	6.3	6.0	4.2	0.8	4.9	9.1	6.4	5.1
China	7.2	6.5	13.8	12.5	8.1	1.2	6.5	7.8	8.7	7.2	-1.6	4.8	10.4	7.1	6.9
Republic of Korea	16.3	11.0	4.5	3.7	1.7	4.7	6.1	4.9	3.3	1.2	3.2	5.0	7.7	5.6	4.3
South-East Asia	10.8	5.0	2.4	4.7	5.7	3.6	2.4	2.6	2.8	3.2	2.5	1.5	1.8	2.5	1.8
Indonesia	13.6	7.4	1.3	6.7	6.6	3.7	1.9	1.8	3.2	4.9	3.2	-0.4	2.3	2.4	0.8
Malaysia	14.2	4.7	4.0	3.7	9.1	4.8	2.5	3.5	3.0	1.9	0.2	2.0	0.9	4.0	1.6
Philippines	10.4	-0.5	1.7	3.1	7.0	1.9	-1.0	0.1	2.1	4.8	4.0	-2.9	-1.0	1.9	3.7
Thailand	6.5	8.6	-3.5	7.4	2.7	5.3	4.6	4.4	3.2	2.8	2.5	5.9	2.3	1.9	1.1
South Asia	6.5	3.1	5.6	8.1	4.7	1.3	1.8	2.6	2.8	3.8	1.8	1.2	3.1	1.3	3.0
India	3.9	6.3	6.8	12.5	3.8	0.5	1.8	2.9	4.1	5.0	2.3	1.3	0.7	3.3	0.5

Figure 8.10: Investment Growth Rates, Overall Labor Productivity, and Industrial Labor Productivity (1970-2014)

Source: UNCTAD (2016)

In addition, the concentration of low-tech industries also leads to limited linkages between production sectors, both backward and forward. This lack of linkages results in low knowledge and technology diffusion among production branches, hindering opportunities for developing production efficiency and upgrading labor productivity in all interconnected sectors within the production network.

A Case of Stalled Industrial Development in Mexico

In the case of Mexico, post-World War II industrial expansion was initially robust (7.5% per year), leading to an increase in industrial employment and the development of labor productivity. However, during the economic crisis in the 1980s, Mexico's overall economic growth stagnated, affecting industrial expansion and production efficiency. The country's industrial growth resumed after joining the North American Free Trade Agreement (NAFTA), attracting numerous factories from the United States and Canada. Despite increased export quantities due to the shift in production to Mexico under NAFTA, this did not positively impact production efficiency and labor productivity, both of which increased only minimally. Private sector investments in Mexico remained low.

Examining labor productivity growth in Mexico from 1970 to 2012, it averaged only 0.2% per year. Total Factor Productivity (TFP) did not improve during this period. Mexico's economic case is significant because, despite liberalization in the financial and trade sectors, it did not positively affect production potential. The low backward and forward linkages in foreign-owned industries in Mexico resulted in insufficient private-sector investment. Furthermore, the Mexican peso strengthened continuously due to increased exports, adversely affecting other types of exports dependent on internal factors. The case of Mexico illustrates that

the relocation of production to Mexico had positive effects only on increased exports, not on Mexico's economic structure, efficiency, or productivity. This is reflected in Mexico's low GDP growth, low private sector investment, and the slow capital accumulation process. Additionally, the overvalued peso had negative implications for the competitiveness of Mexico's other domestically produced goods, limiting its ability to compete internationally in various production sectors.

A Case of Stalled Industrial Development in Indonesia and Thailand

The stalling of industrial development is a shared challenge among countries in the Southeast Asian region, exemplified by Indonesia and Thailand. Both countries experienced economic restructuring and expansion of industrial production, employment, and investments from both the private and public sectors after the 1960s. However, this process halted after the economic crisis of 1997, commonly known as the "Tom Yum Kung Crisis," leading to a significant decline in investments and a slowdown in industrial growth. Both nations struggled to return to pre-crisis growth rates.

In the case of Indonesia, the post-1997 economic crisis impacted its industrial structure, disconnecting it from global value chains. The majority of production became concentrated in low-tech basic industries, relying heavily on agriculture and natural resources, such as beverages, food, rubber, and petroleum. This limited opportunities for developing production efficiency through participation in high-tech manufacturing. Both the private and public sectors in Indonesia have consistently invested at low levels since the economic crisis.

In the case of Thailand, industrial development initially benefited from the relocation of production and integration into global value chains, particularly in the electronics and automotive sectors. However, Thailand encountered similar challenges as Mexico and Indonesia. Excessive export-driven growth led to trade imbalances, continuous currency strengthening, and a decline in private and public sector investments. Moreover, GDP growth faced a prolonged slowdown, attributed to a lack of diverse linkages between the export sector and other sectors within the country, hindering overall efficiency improvements. The growth rate of labor productivity remained exceptionally low. Thailand also exhibited dualistic economic patterns, with a modernized economy connected to international trade and services, coexisting with a traditional economy relying on agriculture or low-efficiency service sectors, often referred to as the informal sectors.

8.3.2 Premature deindustrialization

In addition to the case of industrial development stall, which illustrates the developmental challenges faced by several developing countries, there is a more severe form of the issue known as premature deindustrialization. This occurs when the share of industry in the economy contracts before the country reaches high-income status. This phenomenon contradicts the typical process where the industrial sector decreases as the economy continuously develops into a high-income country.

In the case of Latin American countries, namely Argentina, Brazil, and Chile, a clear contraction in the share of the industrial sector in the economy is evident. These countries experienced rapid industrialization in the 1930s and 1940s, particularly during World War II, with the industrial sector contributing 34%, 31%, and 20% of value-added to the total economy, respectively.

However, by 2014, these proportions had decreased dramatically to 17%, 13%, and 12%, respectively. This reduction resulted from the diminishing role of the industrial sector, leading to an overall decline in production efficiency and labor productivity. Consequently, the agricultural, mining, and processing sectors of agricultural and natural resource products regained prominence in the economy. This led to a reverse migration of labor from the modern industrial sector back to these traditional branches.

The implications of these changes resemble those of industrial development stalls but with more significant consequences. The focus on exporting agricultural and natural resource products led to decreased private sector investments due to a lack of incentive for expanding industrial production. This, in turn, resulted in long-term repercussions on the economic development process, leading to a halt in overall efficiency improvements. Average income levels for the population were affected, trapping the country either in a poverty trap or a middle-income trap for an extended period (excluding Chile, which achieved income from copper exports, attained developed country income levels, and became an OECD member).

Aside from middle-income countries, premature deindustrialization also affects low-income countries, as seen in many African nations. Political instability or internal conflicts create uncertainties that disrupt the continuous industrial development process. Rapid declines in industrial production and a shift toward increased production of agricultural and natural resource products occur. Such premature deindustrialization in low-income countries prolongs the development process, necessitating a more extended period to escape poverty traps. This requires accumulating capital from the private sector and investing in state infrastructure, including the creation of networks linking production sectors

(backward and forward linkages) for knowledge and technology dissemination through supply chains.

Summary

In the first section, the relationship between economic expansion and industrial development is explored, utilizing data and analytical methods to examine various countries worldwide. The expansion of the industrial sector's share in total production is statistically correlated with economic growth and per capita income. The analysis distinguishes between developed countries, particularly those in Europe and the United States, which experienced industrial development during the first unbundling, and countries in Asia and Eastern Europe that developed industries during the second unbundling. The relationships in the first group are linear, indicating a consistent relationship throughout development. In contrast, the second group shows a parabolic relationship, reflecting a shift in industrial types during early development until reaching a per capita income of around \$5,000, where the relationship becomes negative, signifying a production base shift.

The key mechanism leading to significant positive impacts on GDP from industrial development involves the movement of production factors (such as labor, land, and capital) from agriculture to industry. This transition is more efficient in utilizing each production factor, leading to increased profitability and capital accumulation. Industrialization also brings about economies of scale, enhancing production efficiency. Moreover, industrial development is linked to other sectors through backward and forward linkages, creating a system-wide impact and facilitating knowledge spillover. These processes mainly occur at lower levels in agriculture, resource processing, and basic service sectors.

The analysis further explores the relationship between the industrial value-added per capita and the dispersion of industry types (measured by the Gini coefficient). In the case of countries in the first unbundling group, the relationship is linear, indicating a stable industrial structure until reaching high-income levels. However, for countries in the second unbundling group, there is a change in the relationship during early development. As income from industry rises, there is a reduction in the diversity of industrial types (to focus on target industries with advantages) until per capita income reaches around \$5,000. Beyond this point, there is an increase in the diversity of industrial types, reflecting enhanced technological and innovative capabilities.

The text also highlights cases of industrial development stalls and premature deindustrialization in countries like India, Mexico, Indonesia, and Thailand. These situations pose challenges to continuous development, and policies should

address these issues to avoid long-term economic repercussions such as falling into poverty traps or middle-income traps.

Overall, the study emphasizes the critical role of industrial development in economic growth, drawing attention to various factors and mechanisms that contribute to positive or negative outcomes in different countries' development trajectories.

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