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THE LEGACY OF FRIEDRICH LIST: THE EXPANSIVE REPRODUCTION SYSTEM AND THE KOREAN HISTORY OF INDUSTRIALIZATION

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ABSTRACT

This study revisits the theory of Friedrich List from a more comprehensive and modernized perspective and applies it to the Korean history of industrialization. Although List is well known as the scholar who insisted on the protection of infant industry, his argument on protectionism is a part of the broader picture depicted in his book *The National System of Political Economy* (1841). This study follows his theoretical legacy in various fields of study. Although we can find his theoretical influence in several fields of research such as the national innovation system, concept of national competitiveness, and theory of developmental state, these studies fail to embrace all the arguments of List. Additionally, theses models focus more heavily on the explanation of historical and regional development phenomena without providing general principles of economic development behind the phenomena. This study therefore aims to suggest the expansive reproduction system as a generalized and modernized version of List's theory and to show its example by using the Korean history of industrialization. Consequently, we argue that the economic development of Korea has been achieved by putting the theory of List into practice.

Keywords: Friedrich List, Economic Development, Korean Economic History, Economic Policy

1. INTRODUCTION

Friedrich List is best known for his ideas on the protection of infant industry. Nevertheless, his arguments for protection are only a part of a much broader set of ideas that concern the national

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economic system. Indeed, Henderson (1983) was apt in pointing out that describing List simply as a "protectionist" fails to encompass fully the extensive scope of his contributions.

List's main work as an economist is *The National System of Political Economy* (1841). It was in this monograph that List articulated important ideas on the doctrine of national economies, the introduction of productive power, and the theory on development stages. In this line of theories, he proposed policy implication for his country, Germany, whose development stages at the dawn of industrialization lagged behind those of contemporary Britain. His proposed policy for Germany included the protection of infant industry as a way of fostering the productive power of the nation but as part of other action agenda in their historical context to help stimulate the development stage of the country. It is important, therefore, for readers to study his theory with a more comprehensive perspective, rather than focusing narrowly on his proposals for German action plan alone.

In addition, current political and economic conditions do not allow for a simple application of his proposed policy implication, which is the protection of infant industry. Because the 21st century features advanced industrial societies and the trend of globalization, his industrial policy for protectionism itself, developed in the first industrialization era, cannot be applied in a straightforward way without a more comprehensive understanding of his theory. (Soete, Verspagen, and Weel 2010) Furthermore, due to the high level of complexity in the technology and science of the 21st century, protection of the infant industry – the policy regarded as List's signature contribution – no longer guarantees economic development, nor enables a country to "catch up" to the nations leading in industry.

Therefore, an in-depth and more comprehensive examination of List's theory, rather than just his policy action plan tailored specifically to mid-19th century Germany, would provide a much more useful picture that can be applied to the current economy. This study introduces his theory by using more comprehensive and modernized perspective and then tries to capture its broad picture. We follow his theoretical legacy in various fields of study. Although we can find his theoretical influence in several fields of research such as the national innovation system, concept of national competitiveness, and theory of developmental state, these studies fail to embrace all the arguments of List. Additionally, theses models focus more heavily on the explanation of historical and regional development phenomena without providing the general principles of economic development behind the phenomena. This study therefore aims to suggest the expansive reproduction system (ERS) as a generalized and modernized version of List's theory and to show its example by using the Korean history of industrialization. Finally, we argue that the economic development of Korea has been achieved by putting the theory of List into practice.

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The remainder of this paper proceeds as follows. In section 2, we summarize and reinterpret the theory of List from a comprehensive perspective. Section 3 presents the related literature influenced by List. Section 4 introduces a new model that embraces the entire picture of List and section 5 provides an example of the model by using the Korean history of economic development. Section 6 offers concluding remarks.

2. THE NATIONAL SYSTEM OF POLITICAL ECONOMY

1) Dynamic System Approach

As his book title indicates, List's argument and theory are based on the dynamic system approach. His objective function is the development of the system, rather than the maximization of consumer's utility or firm's short-term profit. In the first chapter of his book, The National System of Political Economy (1841), List defined a system boundary that is national economy, criticizing Adam Smith's boundary of system, which is cosmopolitan economy. Therefore, his objective function is the development of a "national" political economic system. This objective is clearly again pronounced when List explains the concept of productive power, insisting that the nation or the individual should sacrifice, or even relinquish, their immediate material property in order to a more developed future national economy. (List 1885, p. 370)

List also explains that productive power, a major concept in his theory that will be explained in more detail further on in this paper, is dynamical. To the question, "power is more important than wealth. And why?" List answered, "Simply because national power is a DYNAMIC FORCE by which new productive resources are opened out, and because the force of production are the tree on which wealth grows, and because the tree which bears the fruit is of greater value than the fruit itself." (List 1885, p.46)

In this dynamic perspective, the study of history, which examines the process by which a nation develops, thus becomes crucial. List believed that knowledge, which plays an important role in national wealth, had been accumulated over time and that "the present state of the nations is the result of the accumulation of all discoveries inventions, improvements, perfections, and exertions of all generations which have lived before us." (List 1885, p. 140) In this sense, understanding the development of nations also requires an examination of history. Accordingly, List tried to incorporate historical research into his own work.

When expounding the system approach, List argued that the wealth of a nation was not determined by a single factor. Rather, national development was a result of complex interactions between economic, institutional, and political factors. List emphasized the cycle of feedback between individuals, social institutions, and economic environments. "Individuals derive the

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greater part of their productive powers form the social institutions and conditions under which they are placed," he wrote, adding that "powers of production, and consequently the wealth of individuals, growing in proportion to the liberties enjoyed to the degree of perfection of political and social institution, while these, on the other hand, derive material and stimulus for their further improvement from the increase of the material wealth and of the productive power of individuals." (List 1885, p.107)

List's dynamic system approach is shown well in his theory of development stages. His dynamic and systemic perspective inevitably introduced the hierarchical character of the levels of development among nations. This is important, because if policy makers or economists do not consider the differences in the levels of development among nations, derived policy from them suitable for fully industrialized countries may be regarded also as a solution for an agricultural country. List's theory therefore has avertical component, or contains implicitly state variable that represents the level of development in national economy. List argued that this state variable should be considered when a policy is implemented, especially comparing the case of Britain and that of Germany. Moreover, List insisted that all nations aim to climb to the higher development stages, rather than staying in the current status quo of wealth.

2) Productive power

List claimed that for a nation to climb higher up in its level of development, it needed to increase its productive power. Although List did not give an explicit definition of the term "productive power," the concept can be understood through his descriptive explanations. The term, then, allows us to grasp a more comprehensive understanding of his ideas.

According to Henderson (1983), productive power, in a broad sense, "included political, administrative, and social institutions, natural and human resources, industrial establishments, and public works." (Henderson 1983, p. 160) Levi-f aur (1997) also summarized the concept of productive power, explaining that productive power is comprised of three kinds of capital: the natural, material and mental capital. Interacting among three capitals creates the wealth of nations.

List believed that productive power was not driven by just one component, as current growth theories insist, but was both a result of a well functioning system as well as the driving force that developed the system further. In his understanding, as long as the system continued to stimulate productive power, and policies helped the system to continue doing so, "power has been added to power, and productive forces to productive forces. (List 1885, p. 46)" This was how he explained the success of the British economy. He further argued that once a nation lost its productive power, it became poor and miserable. Giving as examples the historical decline of Spain,

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Portugal, Hanseatic cities, and the Italian city-states, he concluded that "the power of producing wealth is therefore infinitely more important than wealth itself. (List 1885, p, 133)"

How, then, can nation build up its productive power? List gave not just one, but several factors that can build this power, ranging from cultural development t implementation of proper policies. He especially emphasized the role ofgovernment/policy in concluding these factors, and suggested the protection of the infant industry, various factors that comprised the system could develop in interaction with each other. In boosting a positive interaction between the components, his ideas concerning technological progress, education, and the reinvestment of wealth stand out prominently, especially in the eyes of a present-day economist.

3) Technological Progress and Education

List was one of the earliest scholars who recognized the productiveness of intellectual work, the interrelationship between tangible and intangible work, and the "systematic interaction between science, technology and skills in the growth of nation (Wendler 2014; Soete, Verspagen, and Weel 2010)." He criticized Adam Smith and Jean Baptiste Say for not distinguishing mental capital, which is comprised of skill, training, and enterprise, from material capital, by which he meant machines, raw materials, and instruments. To use modern terminology we can say that list drew attention to the critical role of technology, science and institutions in fostering the productive power of a nation and eventually its economic development.

Moreover, according to Soete, Verspagen, and Weel (2010), List might be the first economist who insisted that there exists correlation among science/technology, education and industry. Without a concrete link between science and technology, he believed, industry could not enjoy enhancements in the process of production and on the products it manufactured. Strength in science and technology, therefore, is a necessary condition for the establishment of strong industries in a nation.

To build up strength in science and technology, List also argued for the importance of education and human capital. Levi-faur (1997) pointed out that List was one of the earliest economists to focus on human capital and the policy for increasing human capital. List saw education as a factor that produced people who create mental capital. List strongly criticized Adam Smith and Jean Baptiste Say because they regarded a person who raised pigs as productive, while deeming people such as teachers, administrators, lawyers, or even intellects like Newton or Watt as unproductive as a donkey in regard to the value of exchange. List argued that although these people could not produce an immediate value of exchange, they played essential roles in fostering theproductive power of a nation. Indeed, an important axis of List's theory on productive power was human capital, and the investment in education to further encourage and

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enhance human capital. “All expenditure in the instruction of youth, the promotion of justice, defense of nations, is a consumption of present value for the behoof of the productive powers,” he explained. “The greatest portion of the consumption of a nation is used for the education of the future generation, for promotion and nourishment of the future national productive powers. (List 1885, p. 139)”

Engineers, who embodied skill and technology, together with merchants, were also important actors in List’s theory. In investigating the decline of Spain and Portugal, he pointed out that the exile of the Jews and the Moors from the Iberian Peninsula was the one of the reasons for Spain’s decline in the late 15th and 16th centuries. List saw this exile as an expulsion of the productive power from Spain. He also explained that the industrialization of England was closely tied to the movement of skilled labor and capital. In the 15th century, List explained, England had invited skilled labor in woolen industry to promote their manufacturing sector. At the same time, because of the Reformation in continental Europe, many skilled laborers and people with accumulated capital also moved to England. Together, these people became one of the promoting factors that triggered the industrialization of England. According to Wendler (2014), engineers, scientists and skilled labor, like Robert Fulton and Justus von Liebig, were the “heroes of a new era (p.188)” for Friedrich List. List warned that the nation that neglected the education of young people, or failed to promote the building of new factories, had no hope for development. In the development of a nation, List insisted, the role of educated people and engineers was essential.

4) Formation of steadfast market: railway construction and the foundation of the Zollverein

In The National System of Political Economy (1841), List emphasized the importance of infrastructure as foundation for national development, as well as a well-established market that grew upon it. He even tried to put his theory into practice by becoming a ‘railway pioneer,’ actively participation in the campaign for the organization of the Zollverein. List gave unwavering support for the formation of the Zollverein. He insisted that “the Zollverein must adopt a protectionist tariff so as to secure the home market for German manufacturers. (Henderson 1983, p.100)”

According to Henderson (1983), List realized the importance of railway construction when he visited New England and Pennsylvania in 1824. In New England, he saw the massive impact railway construction had on the development of the overall local economy. He also took part in the construction of the railroads in a coalmining region of Pennsylvania.

During his visit to the United States, List published an article in a German weekly, the Reading Adler, stating that transportation facilities such as canals and railways led the economic growth

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of a nation. Again in his boo the National System, List pointed to the well-established transportation facilities as the source behind the success of the English economy. The role of transportation was crucial, he argued, in increasing the power of production (Henderson 1983).

In List's theory of national development, then, a well-established market thanks to well-equipped transportation facilities thus occupied a critical position, amply evidenced by his active participation and enthusiastic endorsement of railway constructions and the Zollverein.

5) Reinvestment of wealth

List was clear in his theory of national development that the direction of capital flow was a crucial component. By this he did not mean the accumulation of immediate wealth, but increasing productive power through the reinvestment of accumulated capital.

In his study of the decline of Spain and Portugal, List explained that massive amount of precious metals imported into these countries were spent immediately on purchasing foreign manufactured goods or on luxury items, instead of being used to build up productive power. List focused not on accumulated wealth itself, but on where that accumulated wealth was directed. List believed that on order for a nation to develop, wealth and resources must be reinvested in education, infrastructure, and other factors that could contribute to an increase in the national productive power.

6) Role of policy

The common theme that penetrates List's arguments is the fundamental role of government in increasing a nation's productive power and developing the national system. More specifically, List stated that the stimulus from the government was crucial in transitioning a nation into a higher stage of development, for example from the agricultural to an industrial society, he claimed, a government must improve transportation facilities, encourage investor, found training schools and universities, implement subsidies for foreign trade, and create credit facilities for entrepreneurs to help the transition of the nation into the more developed stage.

In reviewing the case of Germany for specific policy implications, List pointed out that since Germany was not yet fully industrialized and was lagging behind Britain, it must implement special and sufficient tools in order to develop and compete with the British economy. Those tools meant policies. Because Britain was at the highest stage of development it could compete in the market abroad without governmental protection. In fact, the British benefited from free trade. To catch up to British "insular supremacy," List argued, follower nations like Germany should install policies to compensate for their backward status in the competition. In sum, because of the

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different levels of development among various nations, List thus saw the role of government in national development as mandatory.

3. LITERATURE REVIEW: THE THEORETICAL LEGACY OF FRIEDRICH LIST

The first field of research that inherited List's legacy is the research stream on the National System of Innovation (NIS). Although NIS did not originated directly from List's theory (B.-Å. Lundvall et al. 2002), economists have remarked that List's "book entitled The National System of Political Economy might just as well have been called The National System of Innovation," because List's national innovation system emphasizes the role of the state as a coordinating agent in the systematic interaction between invention, research, technology, learning, and innovation(Soete, Verspagen, and Weel 2010).

Researches that adhere to the NIS perspective agree with List's theory of the system boundary, which is national economy. Niosi et al. (1993) pointed out that theconcept of NIS implicitly accepts the importance of the systemic component within the nation more than international systemic components, because within the national boundary, sharing same market and natural resources; more frequent interaction between user and producer; technically-cased independencies; politically driven linkage and determinant, i.e. technological policy.

Another reason to see NIS as a theoretical heir of List's theory is the way NIS provides the framework to investigate the role of government in creating new knowledge and leading economic development/growth. (B.-Å. Lundvall et al. 2002; B. Å. Lundvall 2007; Soete, Verspagen, and Weel 2010) However, as Lundvall (2007) pointed out, without a broad definition of NIS, it is difficult to find the link between innovation and economic development, which is one of the main ideas of List. Although Freeman (1987) first introduced the concept of NIS in a broad sense, aiming to explain the catch-up process and economic development, current research I focused more on a "narrow definition of NIS." This narrow definition of NIS fails to capture List's entire argument, because its objective function is not the economic development of a nation, but the maximization of the creation of new knowledge. Furthermore, although creation of new knowledge is needed for a country to become a technological leader, this objective function is not relevant for many nations that are still ensnared in the Malthusian trap (B.

Lundvall 2007; B.-Å. Lundvall et al. 2002). To embrace List's ideas of development, including the transition from the agricultural to the industrial society, it is therefore necessary to conduct research that uses a broad definition of NIS as its framework.

The theory of developmental state is also connected to List in the sense that it stresses the critical role of government in a nation's development. The theory was formulated to explain the late-

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industrializing countries, especially the rise of East Asian nations from the 1980s, by (Johnson 1982; Amsden 1992; Evans 1995). Leftwich (1995) defined the developmental states as "states whose politics have concentrated sufficient power, autonomy and capacity at the center to shape, pursue and encourage the achievement of explicit developmental objectives, whether by establishing and promoting the conditions and direction of economic growth, or by organizing it directly, or a varying combination of both." In the early days of the theory, Gerschenkron (1962) showed that historically, the development of late comers were always deeply rooted in the role of thestate, although he did not provide the underlined theory of the phenomena. Hirschman (1958) and Myrdal (1968) also pointed out that state intervention was a crucial factor in economic development of a nation. Orthodox neoclassical economists, however, regarded the development as an expansion of the liberal market system, when explaining the development of East Asian countries such Japan, Taiwan, and Korea. By the late 1980s, nevertheless, it was broadly accepted that the neoclassical economic perspective was limited and/or flawed in understanding the East Asian case. In East Asian nations, the phenomenon of the 1980s was impossible to explain without factoring in state intervention (World Bank 1993).

Johnson (1982) explained the catch-up process of Japan by analyzing the role of MITI, which was a powerful Japanese government agency. As he did so, he established the concept of the developmental state. Johnson's seminar work shows that the developmental state primarily aims to achieve economic growth, to increase in productivity, and economic development in terms of competency. According to Johnson, developmental states such as Japan, Taiwan, and Korea consistently guide the market by its elite bureaucracy, as well we by promoting the private ownership of wealth and competition between economic agents.

Amsden (1992) further developed the concept of the developmental state by analyzing the Korean economic development case. She defined the following four characteristics of the Korean economy: a. government played a central role in Korea's economic growth; b. government disciplined private companies to achieve economic efficiency; c. the driving force of rapid economic growth was from the industrial competence of conglomerates; d. learning skills and technologies from abroad was critical in Korean development.

Wade (2003) further evolved the theory of developmental state into the "governed market theory." According to Wade (2003), the economic success of East Asian countries was accompanied by a broad range of government intervention. First, the government controlled the market by concentrated investments and the allocation of large resources to preferred industries. Second, the government's support, discipline, and guidance geared toward strategic industries were critical in the "East Asian miracle." Finally, the government played a crucial role in economic growth by fully supporting the domestic industry for competition in the international

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market. This government-driven industrial policy is different from the liberal market policy, in that the government controls the market process in allocation resources for maximization of the returns to investment.

Yet despite the usefulness of the theory of developmental states in explaining the East Asian experience after World War II, and in showing the critical role of governments in the process, the theory does not present a more general model beyond these special cases. Considering that there still exist many countries trapped in the agricultural economy, it is necessary to construct a model that would apply more generally. This can be achieved by advancing List's idea further.

4. THE EXPANSIVE REPRODUCTION SYSTEM

Kim and Heshmati (2013) and Jun and Kim (2015) continue the discussion of List's legacy in their work of building a framework for analyzing economic development more broadly. While List's scope was limited to the First Industrial Revolution, and focused narrowly on the transition from agricultural to industrial economy, a broader view of history demands a more comprehensive model or framework that can embrace and explain phenomena beyond List's era – the Second industrial Revolution, the IT revolution and the transition toward a knowledge-based society, and the variations in economic systems around world after the second millennium. According to Kim and Heshmati (2013), each society, agricultural and industrial has a distinct economic system than determines how it develops, as depicted in Figures 1 and 2. Moreover, Kim and Heshmati also point out that there are differences in the level of development even within industrialized countries, as depicted in Figure 3.

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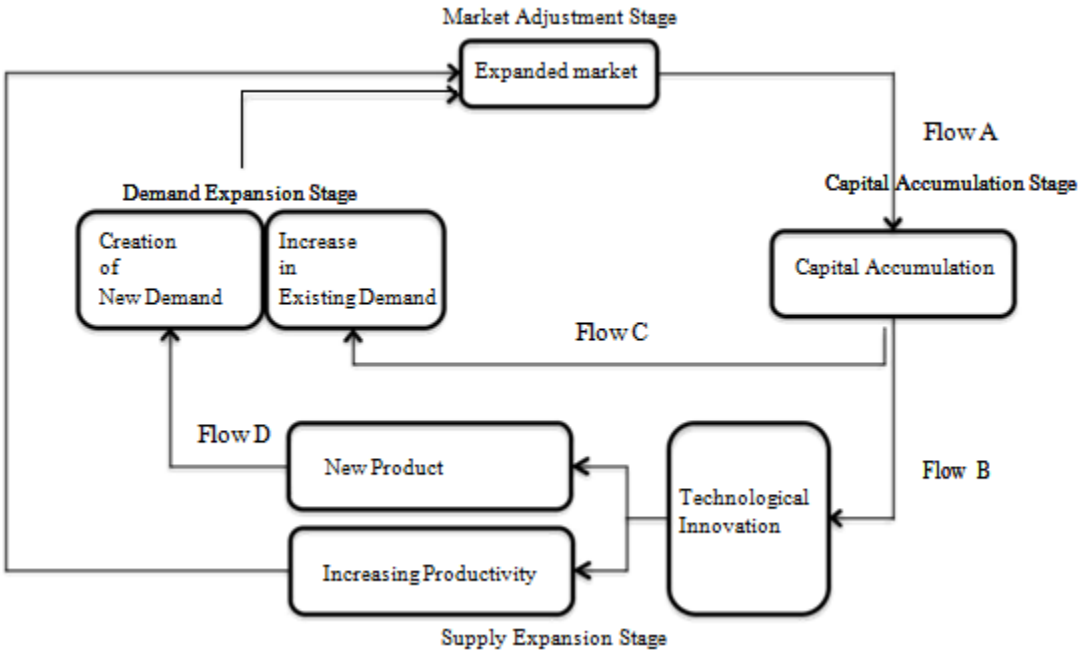

Figure 1: The expansive reproduction system of industrial economy

Source: (Kim and Heshmati 2013; Jun and Kim 2015)

The economic system of the industrial society is the expansive reproduction system (ERS), as depicted in Figure 1. This system consists of four stages, which are capital accumulation, supply and demand expansion, and market adjustment stage. Once capital is accumulated, it is directed toward both the supply stage as a form of reinvestment, and the demand stage, leading to an increase in the income of the consumer. Within the supply stage, investment in technology influences supply and demand in two ways. One is the creation of new goods, which results in the creation of new demand. The other is an increase of productivity. These two streams of technological progress encourage the qualitative and quantitative development of the economy through market adjustment process (Kim and Heshmati 2013; Jun and Kim 2015).

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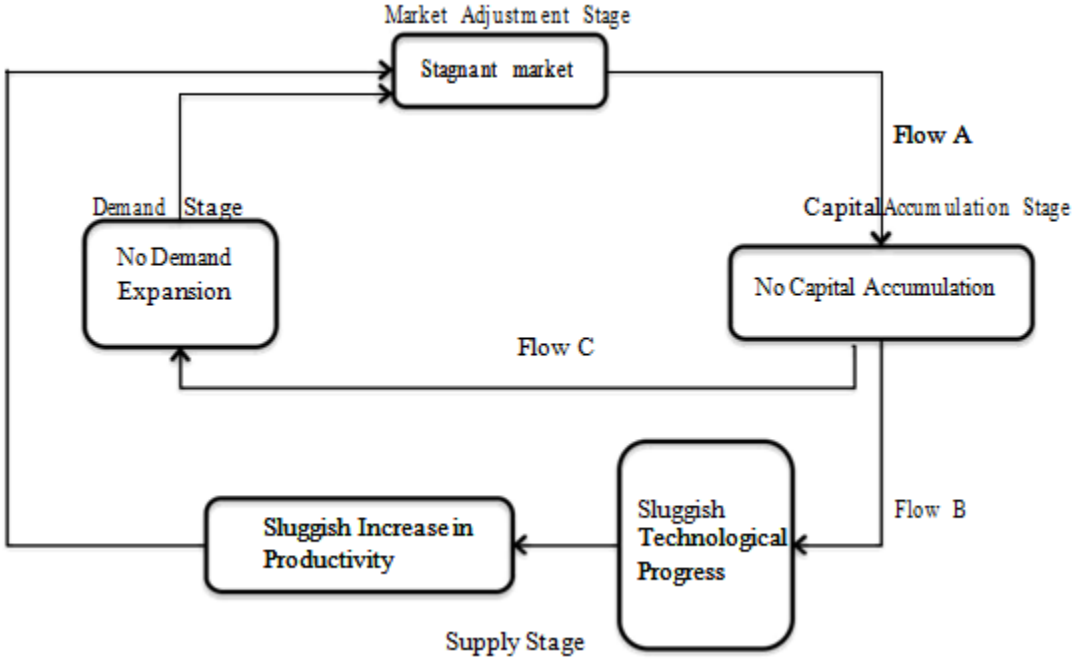

Figure 2: the simple reproduction system of agricultural society

Source: (Kim and Heshmati 2013)

Figure 2 shows the economic system of the agricultural economy. Even though it is also comprised of four stages like the industrialized economy, as depicted in Figure 3, the agricultural economy lacks some of the flows. Missing from this picture is the flow from accumulated capital to technological innovation, which should then have produced the flow from technological innovation to the creation of new demand. This difference traps the agricultural economy in the Malthusian trap in terms of development and growth. The speed of its growth is sluggish or stagnant, while the industrial economy grows and even accelerates in growth over time in terms of the level of growth/development, including the standards of living (Kim and Heshmati 2013; Jun and Kim 2015).

This difference in the pattern and the speed of growth between agricultural and industrial economies comes from the differences in the input of the production function: labor and land in case of agricultural economy; and labor, capital and technology in case of industrial economy (Galor 2011). These different inputs of the production function in the industrial economy lead to different incentives for technological progress and increase in human capital in the sense that capital input forms the virtuous cycle, which consists of educated people, technological progress

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and capital, because capital has high degree of complementarity with technology and educated people(Jun and Kim 2015; Jun and Lee 2014; Galor 2011).

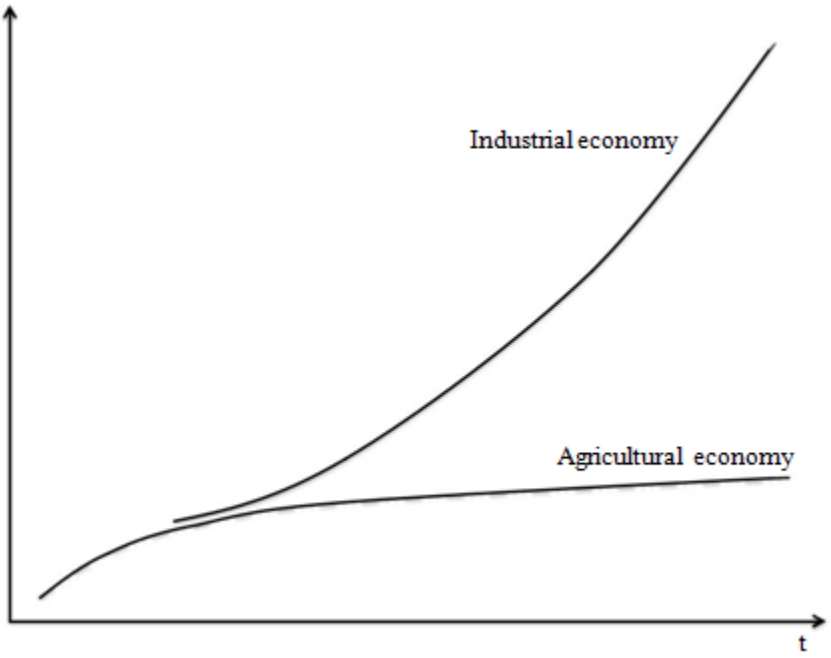

Figure 3: The economic development over time in cases of agricultural and industrial economy

Friedrich List stated that the transition from the agricultural economy to the industrial economy must be analyzed from the perspective of a dynamic system. List enumerated the differences between transition that a leader country, such as Britain, underwent, and that of a follower country, such as Germany. Borrowing the frameworks of Braudel (1982) and Kim and Heshmati (2013) to interpret his argument on the difference, instead of transitioning straight to the industrial society from agricultural, Britain moved from the agricultural society to the industrial society via a mercantile society. While the industrial society has an expansive reproduction system, the mercantile society features an expansive reinvestment system. This meant that Britain became industrialized through accumulated capital and a well circulating system that already existed, as depicted in Figure 4. In other word, Britain just added the component of technological innovation into the already well circulating capitalistic system, whereas follower countries like Germany had to start from the scratch equipping itself with all the components of the system for the circulation to work. Because follower countries need to prepare themselves in more ways than one to establish the system and also to start the circulation, the role of the

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government becomes crucial in the economic transition toward industrialization for these latecomers.

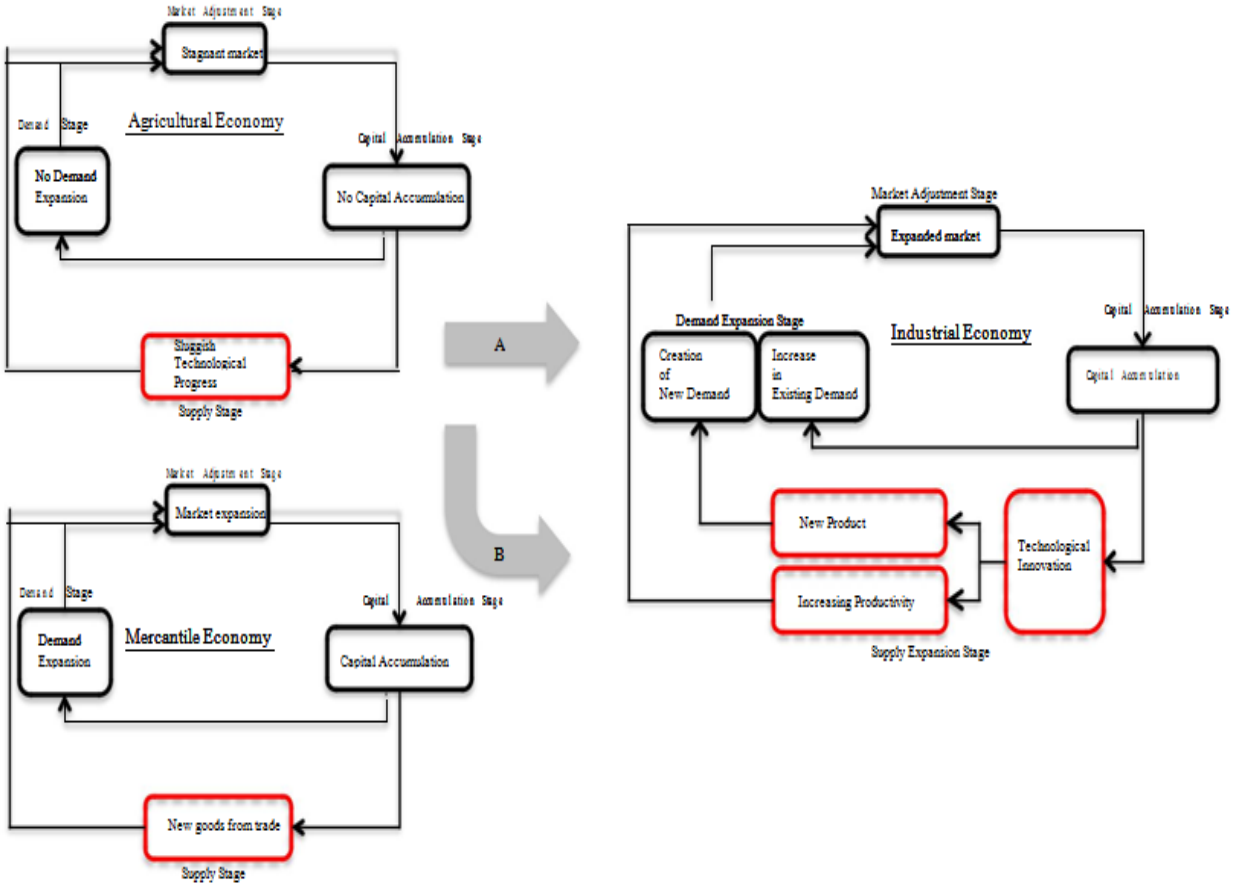

Figure 4: Transition from the agricultural economy to the industrial economy of leader and follower countries: Transition A for follower country and B for leader country

The characteristics of an economy as a dynamic system in List's arguments can be depicted using the framework of the expansive reproduction system such as the one depicted in Figure 5. The ERS does not stay a certain level of development. Once it starts to circulate well, without running into a bottleneck or leaking capital out of the system, the ERS moves up the ladder of development both qualitatively and quantitatively (Jun and Kim 2015). Additionally, as shown by Kim and Heshmati (2013), its speed of development is not linear but accelerating of its speed of growth. This is the first point that we can find the necessity of policy. Because of its nature of acceleration, the gap of development between leader and follower is inevitably diverging without policy under the parsimonious assumption that both economy of leader and follower are equal

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but the level of its development. Therefore, policy that enable faster circulation of ERS is necessary for follower to catch-up its leader country.

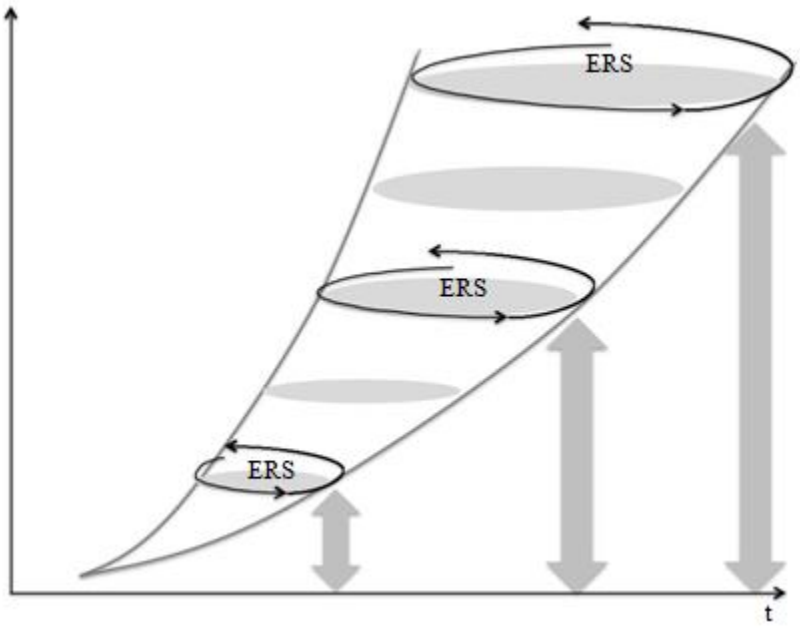

Figure 5: Increase in the level of development over time *Source:* (Jun and Kim 2015)

As mentioned above, technological innovation resulting in new goods and increased productively, as indicated in Flow D of Figure 1, is the main engine of development in the ERS that drives the level of development upward. This is also true of the concept of productive power, for productive power also raises the national system ofeconomy upward. Additionally, the important point is that the role of technological progress is understood in the context of the system with a dynamic perspective. The underlying assumption of the ERS, therefore, meets List's idea of productive power.

Furthermore, considering the fact that creation and expansion of demand is also a significant part of the development in terms of the ERS, it also should be considered that characteristics/history of consumer/market is also crucial part, as already claimed by List. In this aspect, for example, the user-producer relationship investigated (Von Hippel 1978), together with the increase in the level of consumer's income, which has been the traditional territory of Keynesians. Although List considered the market as very important, it is true that is focused more on its quantitative side. List emphasized the process and the impact of the expansion of one item, for example the railway or the Zollverein, while neglecting to consider the diversification of goods, or the emergence of new goods, which can be regarded as a qualitative expansion. Nevertheless, his narrow focus can be understood in a historical context. In the early days of industrialized

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economy, expansion of demand tended to be achieved by quantitative aspect, rather than qualitative way. After a global market emerged through the development of transportation and communication systems, and thus saturating market of mass produced goods in the early twentieth century, expansion of demand could now be obtained by the creation of new demand, a result of innovation and the increase in consumer's purchasing power.

Recall List's argument that wealth by itself matters less than the productive power of a nation when he studied the decline of Spain. He had stressed that Spain declined because they failed to channel their wealth toward boosting productive power, and also because they had expelled the Moors and the Jews who possessed skill and capital. Similar to List's point of view, reinvestment, which re-boosts system, and education, which produces skilled and educated labor, are also important in the ERS. Moreover, among individual, national, and cosmopolitan economy in List's classification, individual and cosmopolitan economy sometimes should be controlled to keep well circulation of the ERS, because individual and cosmopolitan economy, as he had pointed out, could sometimes work against the benefit of the national economy.

The distinction between financial capital and productive capital in the ERS is a good example of this. According to Perez (2003), financial capital and productive capital are determined by the owners of the capital and specifically, financial capital involves the behavior of those who own their wealth as currency or paper asset on their balance sheet. Their aim is to accumulate their wealth in the form of money and to expand this wealth. Productive capital, on the other hand, includes the purpose and the motivation of the economic agent, who creates new value by producing goods and services. Under the standard of the ERS, productive capital is the one that boosts the circulation of the ERS. Financial capital, on the other hand, is the capital that leaks out of the system, shrinking the system's size.

It is at this point that we can find one more necessity of policy. A well-circulated system is not always guaranteed by its own nature. Earlier on, List introduced the different levels of economies –i.e. different system boundaries, which are individual, cosmopolitan, and national economies. Because of the carious spectrum of interests, resources in the circulation that should have been reinvested for expansion and development of the system can easily leak out of the system. Besides preparing and establishing the components of the system, the government also has to guide the accumulated capital toward reinvestment in technological progress and toward elevating the purchasing power of the consumer. In other words, the role of policy is to guarantee the Flow B and C in national economy.

5. THE KOREAN HISTORY OF INDUSTRIALIZATION AS A LEGACY OF FRIEDRICH LIST

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Achieving industrialization is not an easy task. Only a few countries outside of Europe and European offshoots have actually succeeded in industrialization (Wade 2003). Until now, very few countries in the world, like Japan, Taiwan, and South Korea excluding city states such as Singapore and Hong-Kong, have succeeded in achieving long-lasting and sustainable growth processes, which were capable of transforming their economy from a backward stage to an advanced industrial nation (Gerybadze 2016). This study focuses on the Korean case of industrialization. We seek to explain the process of its development in the late 20th century using the ERS model with a comprehensive understanding of Friedrich List's legacy. Following List's theory and the ERS framework, we aim to show that his framework can explain Korea's successful industrialization.

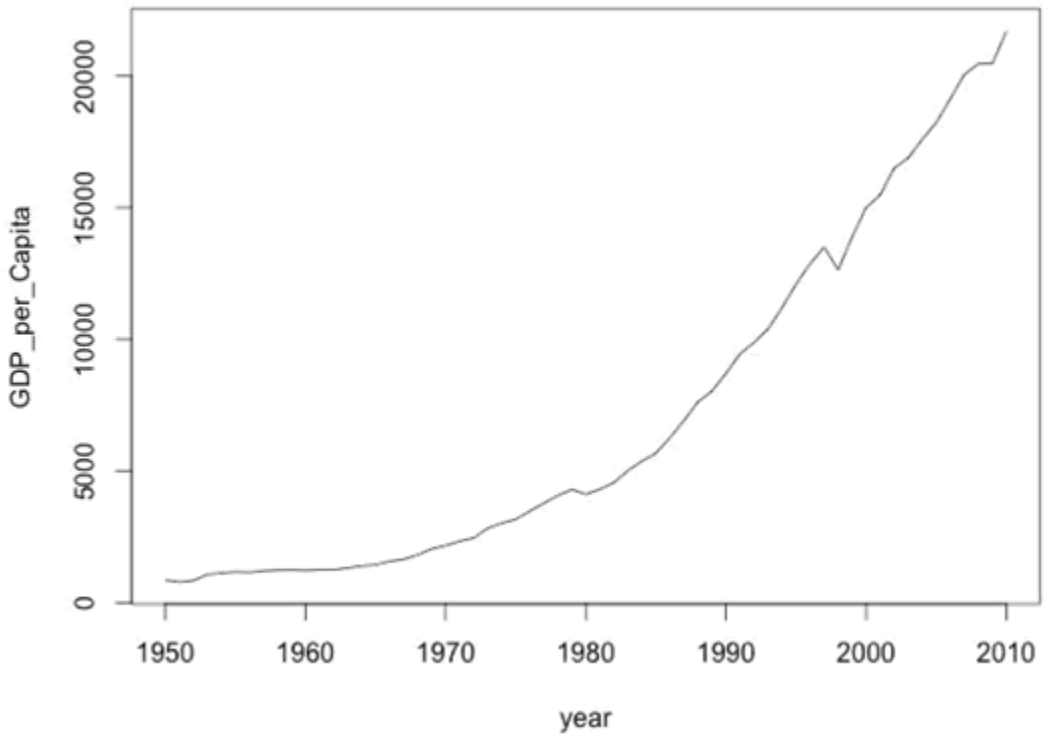

Figure 6: GDP per capita (1990 IntGK$)

Source: Angus Maddison, available at http://www.ggdc.net/Maddison/

Figure 6 shows that Korea's GDP grew rapidly. The historical context behind this phenomenon is a s followed. Korea was Japanese colony from 1910 to 1945. After gaining independence in 1945, Korea was divided into two states when North Korea was placed under the trusteeship of the Soviet Union, and the South Korea was placed under the trusteeship of the United States. When the Korean War ended in 1953, South Korea found itself in the mid-1950s with a

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structural contradiction left of the Japanese occupation, together with the devastation left by the War and the division of territory. GDP per capita in 1953 was 1072 dollars (1990 IntGK$). Naturally, the South Korean government sought to stabilize the nation economically and socially. President Rhee Seung Man, however, was an advocate of liberalism, and did not exhibit a friendly attitude toward state-led industrialization. With the new regime of President Park Chung Hee finally began the first Five-Year Development Plan (1962-1966). At the beginning, the primary goal was not export-oriented industrialization, but the import-substitution industrialization. In 1964, however, the plan changed to gear toward export-oriented industrialization. Under the agenda for export-oriented industrialization, the first (1962-1966) and the second (1967-1971) development plans focused on light industries, causing adverse trade balance from capital goods. The third development plan (1972-1976) aimed to advance industrialization by developing heavy industries for a more balanced growth in trade. By the end of the forth plan Korean economy had begun to soar, as seen in Figure 7. Although until the 1980s Latin American countries performed better than Korea in terms of GNI per capita, Korea soon outdistanced them.

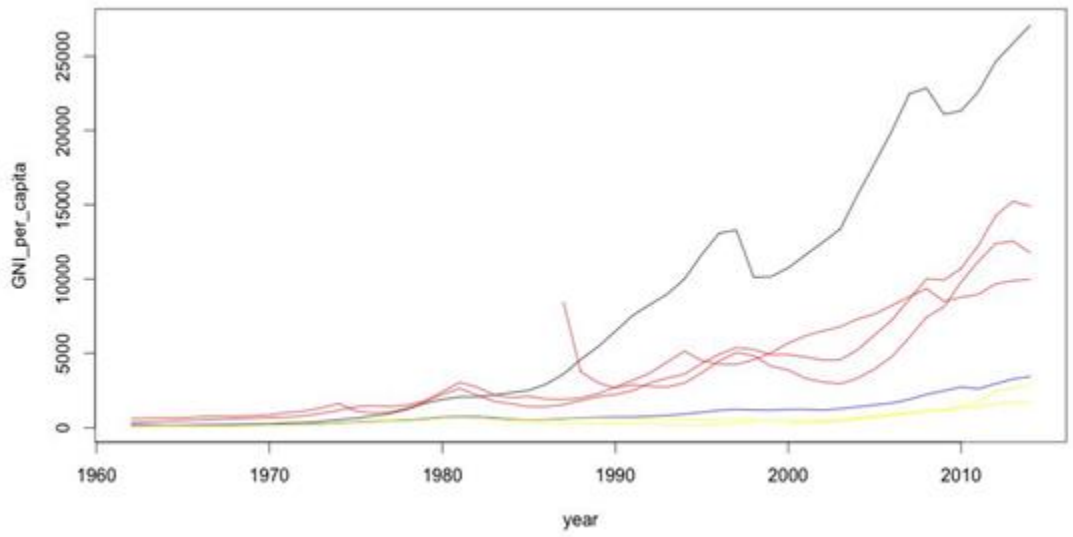

Figure 7: GNI per capita (Atlas method, current US$) of Korea (black line); Latin American countries such as Brazil, Chile, Mexico (red lines); African countries such as Nigeria, Sub-Saharan Africa (yellow lines); and other Asian countries like Philippines (blue line)

Source: OECD, available at: https://data.oecd.org/

The Korean development process can be divided into four periods: a. 1945 to 1960, the first period, during which Korean displayed the simple reproduction system of an agricultural

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economy; b. 1961 to 1971, the second period, when the elements of theERS were formed; c. 1972 to 1981, the third period, when the ERS started circulating; and d. 1982 and beyond, when the ERS was firmly established and circulating well.

The Korean economic system of the first period, from independence in 1945 to the inauguration of President Park, was far from an industrial society. There was no ERS in place, nor were any policy plans such as those suggested by List implemented to escape the agricultural society. This period, however, did allow for a recovery from the structural distortion caused by the colonial economic structure had been skewed for colonial extortion, the abrupt withdrawal of the Japanese, who had been the main agent in the colonial economic system, actually resulted in economic shrinkage and sudden unexpected changes. In 1946, for example, the quantity of rice production fell to 86% of the average quantity of production in 1940-1944, and the fishery production dropped down to 45.4% of the previous production rates of 1940-1944. The value of manufacturing production also fell sharply, at only 25% in 1946 compared to the production in 1939. The shrinking of the trade sector was especially severe, since during the colonial period Korean economy had been specialized into the periphery of Japanese economy. Korea had been relegated to producing food and acting as a market for manufactured goods, heavily reliant on the trade with Japan. This crisis in trade and manufacturing production caused a shortage of necessities and raw material for manufacturing production. In such a dire situation, Korean economy had to make a primary effort to stabilize its economy and recover from the difficulties. In fact, the prime policy goal of the government at this time was the stabilization of the economy and building the foundation for economic independence. The most important factor in achieving this goal was foreign aid, and the United States played a prominent role, which will be explained momentarily.

Institutional and cultural foundations were also laid for the next steps of recovery. Important in this respect was the land reform, which abolished the colonial tenancy in 1951, as well as the draft of the Three-Year Plan for Industrial Development drawn up in 1959. The land reform was driven by various interests, both internal and external. President Rhee, for example, wished to restrain the political party of landowners, while the United States sought to use it as a way to solve the agricultural surplus problem in its own country. It also served the U. S. aim of building a bulwark against communism inSouth Korea. Nevertheless, the land reform ultimately resulted in the abolition of tenancy, knocking down an obstacle blocking the way to economic development, industrialization, and the birth of a new class of capitalists (Lee 2009). The reform also promoted human capital accumulation by weakening the power of landowners who opposed modern education and preparing the way for industrialization (Jun and Kim 2014).

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The Three-Year Plan was the first Korean governmental plan that involved the creation of special organization and the participation of economic experts, even though it was not executed but planned. Although the Korean government had previously planned development strategies in 1954 and 1956, they had been crafted in a hurry, with the purpose of getting more aid from the United States. The experience of constructing the more well-prepared and well-researched Three Year Plan, therefore, served as an important foundation for the planning and the implementation of the economic plans to come in the 1960s (Park 2007; Satterwhite 1994). In designing the Three-Year Plan, indirect influences of Friedrich List can be observed. Among the intellectuals and officials who actively participated in the discourse of the national development plan, there were persons who had studied Friedrich List's theory when they were in Japan during colonial periods (Park 2004). We cannot say, of course, that Korean economic policies before 1964 actually followed the arguments of List, since the aim of policies in the 1950s was import substitution and balanced growth under the influence of Ragner Nurkse. It was true, however, that during this period the average tariff increased from 26% to 30.86%, and in 1958, the revised trade law set an even higher tax rate for industries that needed protection. Nevertheless, the official position of the council for the Three-Year Plan was to adhere to the principle of the free market system, boost the activities of private firms, forego all governmental economic control, and encourage cooperation between the public and private sectors (Economic Planning Board 1959; Park 2007). In sum, the policies of the 1950s were far from the arguments of List in the sense that the Korean government did not regard the role of government as central, nor aimed to transition the country into an industrialized society.

Korean economic policy began truly reflecting List's theory during the second period, from 1961 to 1971. In this period, elements of the expansive reproduction system were formed in Korean economy. When President Park Chung Hee seized power througha military coup d'état in 1961, he sought to legitimize his rule through economic development (Kim 2013, Gerybadze 2016). Even so, three more years would pass for Park's administration to finally start implementing Friedrich List's policies. The first Five-Year Development Plan (1962-1966) initially maintained a similar goal to that of the previous government, focusing on the development of the agricultural sector with the import-substitution policy. According to the first version of this first plan, 75% of the capital was to be accumulated through the internal capital market, although there were no concrete economic foundations upon which capital could be expanded. There was, however, a crucial difference from the attitude of the previous government: the Park administration emphasized the role of the government in expediting the plan (Park 2000).

This first version of the first Five-Year Plan, nevertheless, turned out to be a failure. The increased interest rate, enacted to gather capital, caused inflation while failing to accumulate capital. The effort to boost the stock market resulted in a panic of the stock market. In addition,

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the currency reform met with opposition from the United States and failed to deliver. Consequently, the growth rate dropped from 3.5% in 1961 to 2.8% in 1962 (Park 2000).

Doubting the efficacy of the balanced growth strategy that Korea had pursued since the 1950s, in 1964 the Park administration switched the underlying economic model to the unbalanced growth strategy, one which the Kennedy administration had endorsed. The idea was mainly from the economic model of Hirshman and Rostow, which suggested unbalanced growth, utilization of foreign capital, and export-oriented industrialization with strong connection with foreign market (Oman and Wignaraja 1991). Although it is true that List's idea of protection was already embedded in economic policy even in the 1950s, List's entire idea with systematic perspective regarding protectionism was not yet in place in Korea until 1964, because the context of protectionism before 1964 was to stabilize the agricultural economy, not to transition the society toward an industrial economy.

Actual practical application of List's theory, installing the basic elements of the ERS in Korean economy, finally occurred in 1964 when the first Five-Year Development Plan was revised. The revised plan, which ultimately led to the formation of the ERS, featured changes including export-oriented industrialization, capital formation usingloans instead of internal capital, and an imbalanced growth strategy. The size of the population of Korea, the level of income, and the size of the domestic market had not been big enough to create a well-circulating ERS at that time. The government therefore decided to target foreign customers who had higher income and greater purchasing power. Also, since there was no accumulated capital as priming water for the circulation of flow, the administration deemed that foreign loan was a suitable solution to initiate the circulation of the ERS.

It was true that in England, the country that first achieved the Industrial Revolution and the formation of the ERS, the structure of capitalism had already been established before the Industrial Revolution occurred. As Vries and van der Woude (1997) and Braudel (1982) pointed out, the production part was added onto the already-existing system of capitalism during the Industrial Revolution in England. Likewise, Kim and Heshmati (2013) also emphasized the fact that the English industrialization had been a transition from the expanded reinvestment system to the expanded reproduction system, which occurred by adding the production stage that made room for the technological innovation.

In the case of Korea, however, the economy had to leap from the agricultural economy, which had a simple reproduction system, to the industrial society, which must feature an expansive reproduction system, without the middle stage of the mercantile society, which rolls on an expanded reinvestment system. Because Korea had to overcome such a gap, the 1960s Korean

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economy needed a strong aid to make the transition. It was policy that bridged the leap. To establish and jump start the circulation of the ERS, the Korean government had to launch an adjusted economic plan. The theory of backwardness by Gerschenkron (1962) and his ideas on instrument, which in the case of Germany was the establishment of the investment bank, is also relevant in the case of Korea. A backward country needs to have an instrument to catch up to the leading countries, because many latecomers skip the mercantile economy in their goals of achieving industrialization and creating the ERS.

As mentioned earlier, the direction of capital flow was crucial in the framework of the ERS and also in List's theory. In Korea, because the policy for building the elements and boosting the circulation of the ERS was implemented before capital circulation actually took root in the economic system, the government had to direct the flow of accumulated and/or loaned capital. To promote export and industrialization, the government chose the carrot and stick approach, offering incentives and discipline in turn to achieve its economic goals. To maximize the effectiveness of the loan and to establish the ERS, the state offered various incentives for exporters and created a monopolistic structure to realize the economy of scale. This policy produced monopoly profit of firms, and this surplus was disciplined for reinvestment and for not to be consumed out by individuals who benefitted from the policy (Yang 2012).

To examine the "carrot" side of the policies first, which means the policy for promotion of export, the Korean government pushed for export-oriented industrialization mostly by providing public finance and tax breaks after the revision of the plan in 1964. This worked effectively because President Park nationalized the bank in 1961, using a stick to control the flow of capital in the nation. The government created a structure that generated profit for importers of raw materials and exporters of manufactured goods, by financing export in a way that provided loans to the exporter with a lower interest rate ( ).

The policy on tariff also a played significant role in boosting the expansion of export. For example, the government gave tax exemptions to income tax, business tax, excise tax, and corporation tax for export industries; provided special depreciation schemes for export industries; and offered the privilege of exemption from tariff for raw materials to be exported. The state also provided various privileges to export companies, including the export reserve system, the deficit reserve fund, the overseas market development reserve, and benefits in depreciation to accept the special depreciation rate (Kim 2010). In addition, Korean government initiated the special task forced ream for export promoting and the members of the team included president, ministries and businessmen. Moreover, government specialized the role of the Ministry of Commerce and Industry in promotion of export; opened direct foreign markets by founding the Korea Trade-Investment Promotion Agency (KOTRA); and started the State Export

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Promotion Board in 1965. The Enlarged Meeting for Trade Promotion was also initiated and held more than 150 times in the period between 1962 to 1980, under the direct control of the president, removing economic, administrative, and institutional obstacles that had hindered a more rapid export expansion.(Choi 1992). Additionally, the state drew up an annual plan each year to make every effort to achieve the goal (Yang 2012).

While promoting export with aggressive policies on one hand, the government also sought to use "stick" side of policies to discipline the flow of capital on the other. Amsden (1992) pointed out that one of the characteristics observed in Korean industrialization was the mechanism of regulation on capital and labor. In the context of this regulation, the excess profit enjoyed by export businesses was interpreted as a public asset, to be disciplined into reinvestment. Only the companies that satisfied this regulation were allowed government support. One example is the case of Polyester Inc. When the company proposed to build a polyester factory in Korea borrowing the technology from Mitsui & Co. and Chemtex, Inc., the Ministry of Commerce and Industry accepted the proposal, but required revisions to be made so that the scale of business could be increased to compete in foreign markets. It also required that the entire production of goods to be exported (Lee 2002). The case of Samsung is also on point. When Samsung sought to enter the electronic industry and proposed to build factory for 15% of production for domestic market and 85% of production for foreign market, the government permitted it under the condition that the entire production of company be exported. It also demanded that the patents and technology owned by SANYO Electric Co. & Ltd. and Sumitomo Corp. be transferred to Samsung (Oh 1996; Yang 2012).

The Korean government heavily regulated each individual's asset not to flee from country. The Foreign Exchange Control Act was enacted in 1961, allowing for the court to sentence persons who sent more than a hundred thousand dollars abroad to a minimum of 10 years in prison and to the maximum sentence of death. Additionally, businessman who committed capital flight should swallow an insult from public (Yang 2012). Park Chung Hee's administration also watched out for the conspicuous consumption of businessmen. When Park received information that a certain businessman built a luxurious house and violated the law about land, for example, he would send out agents to the estate for an on-site inspection (Yang 2012; Kim 1990). Because Korean government knew criticism from public against accumulated capital by state-lead industrialization, the public discourse that capital accumulated by governmental support should be reinvested for national economic growth instead being spent on individual wealth was dominant to lessen the criticism (Sagong et al. 1981).

Because the demand expansion stage in the Korean ERS was located abroad, increase in wage and subsequent income of households was not a necessary factor in sustaining a well-circulating

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ERS in the early stage of industrialization. Cognizant of this fact, the government strove to keep the wage levels in Korea low. The competitiveness of Korean industry derived mainly from the meager cost of labor in Korean light industry in the 1960s with the fact that the cost shares of labor in light industries, such as clothing, textiles, and shoes, were 25%, 60% and 33% respectively (Yang 2012). This low-wage policy had lasted until the 1970s.

By implementing such a state-led industrialization, the Korean economy successfully built the structure of the ERS at the late 1960s and achieved considerable economic development. During the first Five-Year Development Plan (1962-1966) the average annual growth rate was 8.5%, accompanied by an increase in the investment rate from 12.4% in 1962 to 18.2% in 1966, and an expansion of the amount of export from 54.8 million to 253.7 million dollars. When the second Five-Year Development Plan was implemented from 1967 to 1971, Korea boasted of a 9.7 % average annual growth rate, together with an increase of 28.1% in the investment rate. By 1971, Korean economy had achieved a $1.1 billion in the amount of export. After 1964, Korea enjoyed a stable 7% growth rate on average until 1996 (Lee 2013).

However, the system built in the 1960s was not perfect regarding the accumulation of capital stage in the ERS. Because the economy specialized in the light industry, which produced low value-added products, high value-added capital goods had to be imported from abroad to build the factories needed by the light industry and this caused the chronic current account deficit that hindered the accumulation of capital. Additionally, a number of insolvent enterprises appeared in the late 1960s following the downturn of the global economy. Although the government established the secretary office to control foreign money in order to solve these problems and liquidated 26 faltering enterprises among the 146 companies found to be using foreign loans, the central problem from the structure of industry was not solved (Lee 2013). Ultimately, a structural change to Korean industries was therefore required to solve the problem. President Park decided to move forward with the plan to use the heavy industry to replace imported capital goods. The second Five-Year Development Plan (1967–1971) reflected this need to change, the goal of which was to establish an industrial foundation for independent industrial development. Under this goal, the government legislated various promotion acts such as the Mechanical Industry and Shipbuilding Industry Promotion Act (1967), Steel Industry Promotion Act (1969), Petrochemical Industry Promotion Act (1969), and Electronics Industry Promotion Act (1969). These promotion acts laid the foundation for deepening the ERS in Korea.

This structural change in the late 1960s and the 1970s can be regarded as driving the circulation of the ERS together with the policy that restricted the reinvestment of accumulated capital. According to Kim and Hong (1990), however, the policy change in the late 1960s that aimed to promote the heavy industry did not affect the pattern of development and growth, which was

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driven by export-oriented industrialization, but rather the share of the contribution of each industry to economic growth. This means that the frame of the ERS established in the 1960s and subsequent policies in the late 1960s provided the momentum for the circulation and expansion of the system.

Indeed, these policies in the 1970s deepened each element of the ERS as well as promoted the circulation of the system, raising the level of development upward. Regarding the supply expansion stage, thanks to the policy, Korean industries diversified within and among industries. For example, the top five exports in 1974 were clothing, electrical equipment, steel plates, shoes, and artificial fiber fabric, while those were rice, fish, nonferrous ore, silk, and iron ore, which were non-industrial goods in 1962. In 1982, those became clothing, vessels, iron plates, shoes, and artificial fiber fabric, which were mostly produced in the heavy industry (Korea International Trade Association 2015).

Regarding this expansion in demand, the implemented promotion policies in the 1970s satisfied domestic demand for capital goods and advanced industrial goods. Kim and Hong (1990), by analyzing input-output tables, show that in the early 1970s, demand for intermediate goods was fulfilled, while that for final goods in the heavy industry was fulfilled after the mid-1970s. They add that this fact reflects the successful import substitution of the mechanical industry in the 1970s, especially after the mid-1970s, when the goods from a broad range of the mechanical industry, including the automobile industry, were successfully substituted for imported goods. Furthermore, as we can see from the change in the list of top five exports, this development into the more sophisticated industry opened up new foreign markets as well.

The government also encouraged the expansion of exports through foreign exchange rate policy. Because the inflation rate was higher than those of the United States and Japan, Korea's main trading partners, the government intervened in the foreign exchange market to keep the effective exchange rate unchanged even under the unitary fluctuation foreign exchange system. In this way, the effective exchange rate of Korea remained at the same level after 1965 (Kim 1980).

The policies for the capital accumulation stage as well as for securing Flow B in Figure 1 were also dependent upon the development of Korean industries. The establishment of the heavy industry required a massive amount of capital. The government raised funds through the normalization of diplomatic relations despite people's opposition. The Japanese government paid billion of dollars free of charge and provided a 200 million dollar long-term loan to Korea. The Korean government did not hesitate to reinvest this capital into new industry. It is a well-known story that a huge part of the funds collected to found POSCO came from the agreement on the "Settlement of Problem concerning Property and Claims and the Economic Cooperation between

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the Republic of Korea and Japan." POSCO held an opening ceremony in 1973 and 75% of all the capital, which was 300 million dollars, was from the government. Additionally, the government raised funds for the new industry by entering the Vietnam War. Korea had dispatched about 320,000 soldiers to Vietnam from 1965 to 1973. Hence, the United States invested 2.3 billion dollars in Korean economic development.

Consequently, the Korean government used such promotion and discipline policies to drive economic development. Indeed, it did not just protect infant industry. The government made an effort not only to construct each element of the ERS but also to encourage the smooth flow of capital among the elements and to prevent the flow from leaking out of the ERS. The results of the policies in the 1960s and 1970s appeared clearly when entering the 1980s, as seen in Figure 7. The divergent result between the Korean economy and those of others came from the differences in the system. The Korean economy built the ERS in the 1960s and achieved momentum by sustained reinvestment in order to foster productive power and eventually climb the development ladder.

6. CONCLUSION

List insisted on the protection of infant industry. However, the argument on protectionism is a part of the broader picture depicted in his book *The National System of Political Economy* (1841). In this book, he explained why the system boundary is the national economy, rather than an individual or cosmopolitan economy. Then, he stated that the productive power of a nation is more important than wealth itself, presenting how to build productive power from the dynamic system perspective. His seminal work on the theory of economic development, however, was likely to have been underestimated because it focused on policy implications for his nation, Germany, and on providing historical examples from the case of the early-industrialized world.

This study revisits List's theory on economic development and tries to re-generalize it by using the ERS framework proposed by Kim and Heshmati (2013) and Jun and Kim (2015). The ERS encapsulates List's theory, namely a. applying the concept of productive power, b. using the dynamic system approach, c. emphasizing technological progress and education, d. dealing with the market, e. emphasizing the reinvestment of wealth, and f. clarifying the crucial role of policy. According to the ERS, because a different level of development exists and because an economy with an established ERS grows at an accelerating rate, a follower country cannot catch-up its leader by using the same policy as its leader. Moreover, considering that the most important flow in the ERS is that from accumulated capital to technological progress through the reinvestment of capital, the government should prevent capital from flowing out of the system.

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This study argues that Korean industrialization was successfully achieved by putting the theory of List into practice. The Korean economy formed each element of the ERS in 1964 with the government's change toward export-oriented industrialization, mobilizing massive foreign capital, and regulating the capital to be reinvested. In the 1970s, the ERS of the Korean economy was driven forward by the heavy industry. The result of the establishment of the ERS and its circulation was revealed after the 1980s compared with the stagnation of other underdeveloped nations.

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