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This article examines the political dynamics of South Korea's human capital development strategy from the early 1960s until today, focusing on the central role of the state. South Korea's state has played a critical role in developing the education and skills training system not only during the period of industrialization but also under the pressures of democratization and globalization, given the lack of strong interests and political capacities of social partners (e.g., business associations and labor unions) in formulating a human capital development strategy. It has advanced a series of education and skills training system reforms to adjust the country to the transformation of the economic structure and the production system, although an available range of policy options have changed over time. Regardless of the type of political regime (e.g., authoritarianism vs. democracy), South Korea has always prioritized the education and skills training system as the driving force of the country's growth and economic competitiveness in the international market.

Keywords: *South Korea, human capital development strategy, role of the state, higher education, vocational education and training (VET), skills.*

There have been growing concerns about the sustainability of human capital accumulation in South Korea (hereafter, Korea), regarded as one of the successful models of remarkable economic development through investing in education and skills training.[1] An increasing percentage of graduates with higher educational attainment have experienced unemployment or precarious employment positions in the labor market, and high school students have been less willing to take the vocational education track.[2] Even large-sized *chaebol* firms, which developed the internal labor market centered on firm-based skills training, have extensively utilized the external labor market for recruiting skilled workers and professionals. In addition, the political capacities of the state, which

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played a critical role in coordinating the education and skills training system during the period of industrialization, have been substantially challenged under the pressures of democratization and globalization (Fleckenstein and Lee 2019; Park 2010, 2013; Yoon and Lee 2010).

Contrary to these gloomy descriptions of its human capital accumulation, several international indicators verify the academic excellence of Korea's education system. According to the Organization for Economic Cooperation and Development (OECD) Program for International Student Assessment (PISA) 2015 result, Korea's academic performance in science, reading, and mathematics was far above the average, ranking its position at the top-tier group (OECD 2018). Its leading universities have raised their international rankings, which are assessed by the indicators to measure the quality of education, such as the student-faculty ratio, the degree of internationalization, and academic reputations.[3] Regarding the skills training system, Korea has always ranked first place at the competition of the World Skills International since 1977, except for three times (1993 defeated by Taiwan, 2005 defeated by Switzerland, and 2017 defeated by China) (*Joong-Ang Ilbo* 2017; KMOEL 2017).[4] Despite growing concerns over its education and skills training system, Korea's human capital development strategy seems to perform much better than those in other advanced industrialized countries. Then, how can we explain the development of Korea's education and skills training system over the past few decades? How has Korea responded to the forces for change in the human capital development? Who has taken the initiative for human capital development to adjust the country to the political and economic challenges of democratization and globalization?

This article examines the political dynamics of Korea's human capital development strategy from the early 1960s until today. In this article, I argue that it is Korea's state that has played a critical role in developing the education and skills training system, not only during the period of industrialization, but also under the pressures of democratization and globalization, given the lack of strong interests and political capacities of social partners (e.g., business associations and labor unions) in formulating a human capital development strategy. There is no doubt that the authoritarian state established and coordinated a set of market institutions, including the education and skills training system, to facilitate the state-led industrialization. Yet Korea's state has continued to take a strong policy initiative for advancing a series of human capital development strategies to adjust itself to the transformation of the economic structure and the production system, although the available range of policy options has changed over time. Regardless of the type of political

regime (e.g., authoritarianism vs. democracy), the state has always prioritized education and skills training as the driving force of the country's growth and economic competitiveness in the international market.

This article proceeds with a second section that analyzes several strands of the literature on the education and skills training system in comparative political economy. The third section examines the establishment of Korea's education and skills training system, focusing on its economic take-off period of the 1960s and 1970s. It accounts for the ways in which the authoritarian state institutionalized and utilized its education and skills training system as part of the state-led industrialization policy. The fourth section assesses how Korea has responded to the mounting pressure for restructuring the system since the late-1980s, a period during which it has experienced democratization, financial crisis, and structural transformation of the economy. By reviewing the government's policies for education and skills training, the study illustrates the ways in which Korea has attempted to adjust its system of human capital accumulation to the rapidly changing political and economic environments. The fifth section concludes with some policy concerns and implications for Korea's human capital development and labor market.

Theoretical Framework

There are several strands of research that examine education and skills training system, but with different analytical focus. First, the varieties of capitalism (hereafter, VOC) literature has examined the diverging developmental paths of the skills training system along the lines of the national production system, which is identified as the two different types of market economies—liberal market economies (LMEs) (e.g., the United States) and coordinated market economies (CMEs) (e.g., Germany) (Culpepper 2003; Estévez-Abe, Iversen, and Soskice 2001; Hall and Soskice 2001; Iversen and Stephens 2008; Thelen 2004, 2014). In particular, these scholars have underlined the importance of specific (or non-transferable) skills in CMEs as the primary source of national comparative advantage. These skills are acquired through firm-based training, school-based vocational education and training (VET), or the dual apprenticeship system, which are institutionally complemented by high degrees of employment and/or unemployment protection to keep the long-term commitments of employers and workers to invest in specific skills, as opposed to general (or transferable) skills mostly funded

by private spending in LMEs (Busemeyer 2009a, 2015; Estévez-Abe et al. 2001; Iversen and Stephens 2008).

Despite the VOC approach's insight on the skills training system, several critical questions remain. There have been intense debates on the sustainability of the institutional arrangements of education and skills training, especially VET in CMEs, since the structural transformation of the economy—represented by the shift from a manufacturing to a service economy, the rise of knowledge-based society, and the increase of overseas production—requires workers to possess different types of knowledge and skills (Mayer and Solga 2008; Palier and Thelen 2010; Thelen 2014). In addition, most advanced industrialized countries (including both CMEs and LMEs) have experienced rapid expansion of tertiary education, which illustrates the locus of education and skill acquisition shifting toward higher education for more general skills and advanced knowledge, departing from the traditional model of VET (Baethge and Wolter 2015; Graf 2018; Matthews 2016; OECD, OECD Data, Population with Tertiary Education).

More specifically, the VOC literature has not been able to offer a comprehensive answer to Korea's recent institutional changes in education and skills training. It identifies Korea as the model of firm-based skills formation or "segmentalism" (that refers to the training system offered to a very small segment of core workers within the boundary of large-sized firms), similar to the case of Japan (Busemyer 2009a; Emmenegger and Seitzl 2019; Estévez-Abe et al. 2001; Hall and Soskice 2001; Thelen 2004, 2014). During the period of industrialization, its large-sized *chaebol* firms began to establish internal labor markets through a set of in-house skills training, efficiency wages, and social welfare programs, although a majority of small and medium-sized enterprises (SMEs) were heavily dependent on the market in the case of hiring workers (Song 2014). The coverage of Korea's firm-based skills training, however, has been shrinking, as even large-sized *chaebol* firms have extensively utilized the external labor market to recruit core workforce—a trend that accelerated after the 1997 Asian financial crisis. In addition, as shown in the college enrollment rate (69.7 percent in 2018), a large number of high school students would like to go to college, which seems to support the dominance of general academic skills in the Korean labor market, instead of firm-specific (or non-transferable) skills (Korea's e-country index, "Enrollment and Advancement Rate"). These developments pose a challenge to the VOC literature to explain the case of Korea as a primary example of CMEs.

Second, scholars have explored the causal relationship between political variables and education. Within this strand of research, scholars have pointed out that the political partisanship of the government determines the variation in the government's policy choice for education. Boix (1997, 1998) claims that left-wing parties are more likely to prioritize investment in physical and human capital to increase productivity and economic competitiveness, compared with right-wing parties that tend to rely more on the private sector and the market. In a similar vein, Busemeyer (2009b, 2015) argues that the social democratic government prefers to expand public spending on higher education because it hopes to gain political support from the middle class, which is the primary beneficiary group of higher education policies. Other scholars assess the linkage between political institutions and education. Ansell (2008, 2010) points to democracy and democratization as being the driving force of education expansion from the elite to the masses. Iversen and Stephens (2008) claim the institutional affinities among the two electoral systems (majoritarian vs. proportional representation), three models of welfare capitalism (social democratic, conservative, and liberal regimes), and three types of human capital formation (general skills, industry-specific skills, and occupation-specific skills) as the key determinant of the diverging pathways of the education and skills training system.

These works provide an important analytical framework in accounting for the effects of political variables on education, ranging from education spending to the expansion of education opportunities. Nevertheless, this strand of research, which mostly employs quantitative cross-country analyses, has not fully elaborated the causal mechanism between the political variables and education. Some scholars have raised doubts about the preferences of left-wing parties over more education spending, since the redistributive potential of education is much lower (or less clear) than that of more traditional transfer policies (Jensen 2011; Solga 2014). In addition, it is difficult to pinpoint which specific political institutional variable matter more, even if there is little dispute on the effects of the political variables on education.

Moreover, neither the political institution (especially the type of political regime) nor the political partisanship of the government seems to sufficiently explain the case of Korea. Its education spending (as a percentage of the government budget) does not precisely correspond to the different types of political regime and political partisanship of the government (KEDI 2017). While political partisanship of the government affects some specific education policy agendas (e.g., students' rights at schools), Korea's democratic governments, regardless of left-wing or

right-wing governments, have rather valued education and skills training as key to the country's growth and economic competitiveness.

Third, other scholars highlight the drastic decline (if not the collapse) of the political capacities of the state in maintaining the state-led human capital development strategy under the pressures of democratization and globalization (Ashton, Green, Sung, and James 2002; Green, Ashton, James, and Sung 2002; Fleckenstein and Lee 2019; Jeong 1995; Park 2010, 2013; Yoon and Lee 2010). A democratic state cannot employ the same policy tool that its authoritarian predecessor had opted for; however, these studies have not taken into account the proactive role of Korea's state in searching for a new model of human capital development strategy even in the face of these political and economic challenges.

Recently, scholars are paying more attention to the central role of the state in establishing a set of market institutions and making public investment in education and skills training (Martin and Thelen 2007; Iversen and Soskice 2019; Thelen 2014; Vogel 2018). Several prominent VOC scholars have recently addressed the important role of the state in constructing and maintaining market institutions in the national political economy (Martin and Thelen 2007; Iversen and Soskice 2019; Thelen 2014). In particular, Iversen and Soskice (2019) claim that the role of the state is critical in making investment decisions on education and skills training in the era of the decline of Fordism and the rise of knowledge-based society. From a different analytical framework, Vogel (2018) also points out the crucial role of the state in formulating the ways in which markets work under the strong influence of the government, as illustrated in the term "marketcraft," although he does not directly analyze the development of the education and skills training system in the national political economy.

Intense debate also exists with regard to the capacity of the state in achieving its policy goals, especially in the post-developmental phase. Wong (2011) demonstrates that Korea, Singapore, and Taiwan, all of which were successful examples of development states, have not been able to employ effective industrial policy as they did in the past. Via comparative analysis of industrial policy for the biotech sector, he argues that unlike their many success stories in the industrial catch-up stage, successful developmental states have not been able to effectively handle problems of uncertainty in "new" industrial sectors in which they lack prior development and investment experience. Meanwhile, Kim and Kwon (2017) argue that Korea's state has still advanced the firm's technological development and innovation by taking advantage of its

inclusive and collaborative networks, and advocate the important role of the state in directing industrial policy while confronting the pressures of globalization and deindustrialization (e.g., the expansion of the service economy). As Wong (2011) points out, the old developmental state has not been able to achieve what it had anticipated and its policy drive has not been as effective as it used to be, given the nature of industry itself and the declining capacity of the state under existent political and economic challenges. Nevertheless, the institutional legacies of the role of the state have still shaped the political pathways of adjustment, even if its capacity has diminished over time.

Building upon these works, this article examines the ways in which Korea's state has taken strong policy initiative in education and skills training system to strategically adjust the country to the rapidly changing political and economic conditions. Its top leaders have utilized education and skills training as a way to upgrade the economic and industrial structure through a virtuous cycle of rapid technological innovation, productivity increase, and economic growth. Given the very weak (or marginal at best) role of social partners (e.g., business associations and labor unions) in institutionalizing the education and skills training system due to the fragmentation of their political and economic interests as well as the short time horizon, Korea's state has been trying to find a more effective human capital development strategy to accomplish its perennial goal of achieving economic growth and competitiveness in the international market. Based on extensive examination of government publications, statistics, policy reports, key policymakers' memoirs, and media coverage, this article analyzes the development of Korea's education and skills training system from the early 1960s until today and critically evaluates its achievements and limitations.

Development of Korea's Education and Skills Training System During the Period of Industrialization

Since its liberation from Japan's colonial rule in 1945, Korea demonstrated strong policy drive for human capital accumulation. In responding to high social demand for education, the Syngman Rhee government (1948–1960) pursued the establishment of compulsory primary education, investing more than 10 percent of government budget in education, which by 1959 reached 96.64 percent of the elementary school enrollment rate (Ahn and Ha 2015; Park 2010). Considering its extreme

poverty right after decolonization and the Korean War, Korea's universalization of primary education within a very short time period is a truly remarkable story.[5] Korea's expansion of primary education entailed neither the political conflicts as those of the United Kingdom and settler colonies did, nor the coordination at the national, industry, and local level as continental and Nordic countries experienced (Iversen and Soskice 2019). Rather, it was driven by the top-down strong policy drive of the Rhee government.

Although the Rhee government established the basic structure of Korea's human capital development, it was the authoritarian Park Chung Hee government (1961–1979) that strategically designed the education and skills training system for the country's economic takeoff. Emulating the Japanese model of state-led development, the Park government underscored the supply of industrial workforce as the primary goal of education and skills training. Yet the origins of Korea's strategy were quite different from those of other CME countries, including Japan. For example, Japan established strong firm-based training system in large-sized enterprises instead of developing industry-specific certificates and qualifications for workers to carry across different firms in the same industry as done in other CMEs (e.g., Denmark and Germany) (Gordon 1985; Thelen 2004; Thelen and Kume 2001). In addition, a large number of Japan's vocational high schools provided a sufficient amount of entry-level workforce to local businesses with the help of local public employment security offices (Brinton 2011). Interestingly, the institutional origins and development of Korea's education and skills training were rather similar to those of LMEs in terms of the country's lack of effective supply of skills from guilds and absence of organized employers yet abundant supply of unskilled labor (Iversen and Soskice 2019). Contrary to those of LMEs, however, Korea's human capital development strategy was directed and formulated by the authoritarian state for the purpose of economic development and growth, with a lack of coordination and/or cooperation with business and labor over education and skills training.

With the strong policy goal of producing a quality workforce who would serve for the state-led industrialization, the Park government actively intervened in education and skills training by keeping strict enrollment quota for all academic institutions corresponding to the supply and demand of the country's need for human resources in the process of economic development ("President Park Chung Hee's National Address in 1962"). It rapidly expanded the number of vocational high schools and public training institutes (Ahn and Ha 2015; Park, Lee, and Ma

2017). Meanwhile, it tightly restricted the college enrollment rate at around 25 percent of high school graduates, as the government considered "excessive" competition for higher education to be of no practical use for industrialization (Im, Park, Park, and Jang 2012, 7; Kim 2007, 32; Kim et al. 2007, 13–14).

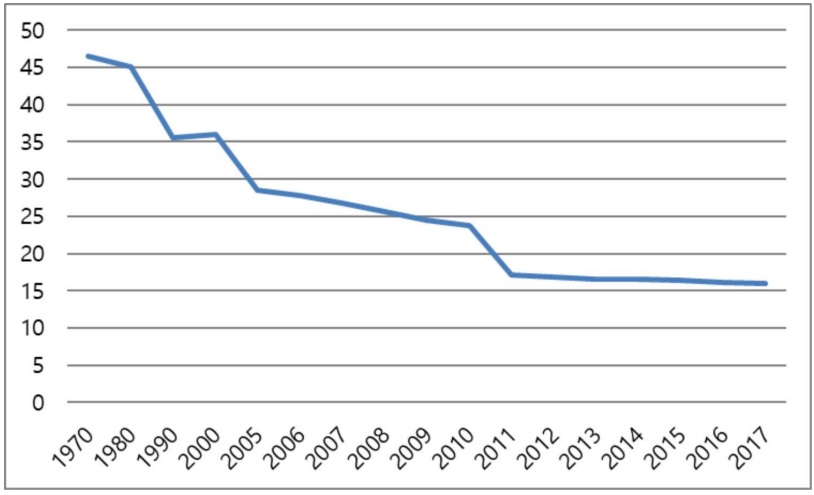
By embarking on heavy and chemical industrialization (HCI) in 1973, the Park government made strenuous efforts to utilize the education and skills training system to expand the supply of skilled workers, targeting steel, nonferrous metals, shipbuilding, machinery, electronics, and chemical industries. Despite the increasing demand for skilled workers, most Korean firms, even large-sized chaebols, were not much interested in investing in skills training for their workers. To secure a stable supply of skilled workers, the Park government legislated the Special Measures Law for Vocational Training in 1974, which required large-sized firms with more than 500 workers to provide in-house skills training, with the payment of levy as the penalty for noncompliance. To push further for the improvement of skills training, the government implemented the Basic Law for Vocational Training in 1976, whose coverage was extended to firms with more than 300 workers and imposed much stricter regulations on firms to make investment in firm-based training (Ashton, Green, Sung, and James 2002; Green, Ashton, James, and Sung 1999; Park 2013; Ra and Kang 2012). Since the late 1970s and early 1980s, large-sized chaebol firms began to establish firm-based training system and enhance the quality of workforce through various in-house training programs, although it was the authoritarian state that had initially pushed them to institutionalize such system, as opposed to each firm's voluntary strategy for improving comparative institutional advantages. This developmental path was quite different from that of collective skills training based on social partnership among business, labor, and the state as seen in other CMEs (Hall and Soskice 2001; Thelen 2004; Thelen and Kume 2001).

The Park government simultaneously emphasized the development of natural sciences and engineering majors at universities in order to produce highly skilled engineers and professionals for the heavy and chemical industries. The government decided to expand engineering departments at national universities in 1974 and provided 51 engineering majors at 18 national universities with generous research funding to undergird the HCI project (Kim 2010). A large number of national and public research institutes were also established to undertake large-scale research-and-development (R&D) projects and given institutional and financial support from the state. The state's prioritization of natu-

ral sciences and engineering in education policy as the primary source of growth and competitiveness was further reinforced by the authoritarian Chun Doo-hwan government (1980–1987), as illustrated by the founding of top research schools such as the Korea Advanced Institute of Science and Technology (KAIST) in 1984 and Pohang University of Science and Technology in 1986 (Kim 2010).

The characteristics of the authoritarian regime—being relatively free from intense electoral competition—enabled the Korean state to adopt state-led human capital development strategy for industrialization. Nonetheless, Korea's authoritarian state was not always able to achieve its planned policy outcomes. Efforts to maintain vocational high schools as the supply chain of the industrial workforce were not very effective, as shown in the declining proportion of vocational-track students (see figure 1). The authoritarian state failed to change social and cultural perceptions on vocational high schools (e.g., education for low school achievers and low income families) and to narrow down the

Figure 1. Proportion of High School Students on the Vocational Track



Source: Korean Education Statistics Service, "High School Vocational Track."
Note: In 2010, the Korean government changed the category of high school from 'general high schools' and 'vocational high schools' to 'general high schools', 'specific-purposed high schools' (e.g., foreign language high schools and science high schools), 'vocational high schools', 'autonomous high schools', inter alia, which might have contributed to the drop in the number of students on vocational track, particularly in 2010.

wage disparities along the lines of educational attainment in the labor market.[6] The Park government's ambitious policy emulation of the German dual vocational training system was not successful either, because employers, especially in SMEs, treated young trainees as easy-access cheap labor and did not make commitments to them for workplace training (Jeong 2002). Despite its remarkable achievements in human capital development during the period of industrialization, Korea's state did not remedy several critical problems in the education and skills training system. Under the dual challenges of democratization and globalization since the late 1980s, the state has continued to search for a new model to adjust the country to the rapidly changing political and economic conditions.

Korea's Search for a New Model of Education and Skills Training System

Democratization and Human Capital Development Strategy

After democratization in 1987, Korea continued to focus on education and skills training as key variables for economic growth and competitiveness. However, rapid development led policymakers to depart from the model pursued during the early stage of industrialization—which centered on unskilled and low-skilled workforce—and in search of a new strategic model of human capital development. Although vocational high schools still provided a large number of young, entry-level manpower, Korea's democratic state began to emphasize two-year vocational training colleges as the channel to supply industrial workers, in particular semi-skilled technicians, as Korea's economy moved toward a more advanced stage of development. In addition, it pursued improvement of four-year university education, especially in natural sciences and engineering, to produce highly skilled engineers and professionals as a response to the changing industrial structure—from labor intensive sectors to capital and technology intensive ones.

The conservative Roh Tae-woo government (1988–1992), which came to power after the country's first free elections, assumed the policy goal of the education and skills training system from its authoritarian predecessors. In particular, the Roh government supported the expansion of two-year vocational training colleges to produce more semi-professionals and technicians in order to meet the rising industrial demand

(National Archives of Korea 1990a, 1990b; Park, Lee, and Ma 2017). In 1991, it also revised the Law on Metropolitan Area Planning to allocate additional enrollment quotas of natural sciences and engineering majors to a few leading universities in the metropolitan area, whose development had been strictly regulated by the state in order to preempt social and economic disparities between the metropolitan area and other areas in the process of economic development (National Archives of Korea 1991; Yang 2015).

The importance of higher education as the driving force of the country's growth and competitiveness was further elaborated and materialized with the following conservative Kim Young-sam government (1993–1997). The Kim government advanced more comprehensive reform for education and skills training, particularly in response to intense global market competition brought about by globalization. Since the early 1960s Korea promoted an export-oriented growth strategy and so has been exposed to a high degree of economic openness, which raised serious policy concerns about how to protect its vulnerable economic structure against fluctuations in the global market. The Kim government took "globalization" very seriously and believed in the improvement of human capital as the most effective tool to maintain Korea's growth engine and competitiveness (Ahn and Ha 2015). Under the strong political auspice of Kim Young-sam, in 1995 the Presidential Commission of Education Reform proposed comprehensive educational reform—the so-called 5.31 Education Reform—which pushed the acquisition of more advanced skills and knowledge in education to facilitate Korea's smooth transition to knowledge-based society (Ahn and Ha 2015; Park 2010; Park 2013).

Most of all, under the pressure of intensified global market competition, the 1995 education reform extensively liberalized the establishment of colleges to improve the quantity as well as quality of college education for human capital accumulation. The reform transformed the overall picture of Korea's higher education, contributing to the rapid increase in the combined number of two-year vocational training colleges and four-year academic colleges/universities from 304 to 335 between 1995 and 1997—and finally adjusted to 340 (as of 2018) (Korea's e-country index, "Higher Education"). Despite the dramatic transformation, the rapidity of quantitative expansion has resulted in a mismatch between supply and demand of the labor-market workforce, especially for college graduates, as will be elaborated below.

In the realm of VET, the Kim government introduced the dual system as an emulation of the German VET—a policy that had been intro-

duced earlier by the Park Chung Hee government in the 1970s, but had failed. The Kim government implemented the dual system as a pilot study from 1994 to 1997, which combined two-year academic education in vocational high schools and one-year training in workplaces. This program was unilaterally driven and imposed by the state, despite the serious concerns over its feasibility (Park, Lee, and Ma 2017). Neither business associations nor labor unions contributed to the program's design or management—something that would have required more long-term political and economic commitments from all parties involved. Despite the extension of the dual system as a full-fledged program in 1998, it was ultimately abolished in 2008 because of various problems, such as low wages, lengthy working hours for students, and weak skills-training components on production sites (Lee 2007; Park, Lee, and Ma 2017).

After democratization, the system became more vulnerable to the pressure of fierce electoral competition—given the fact that education has always been one of the most controversial policy agendas in Korea—and less capable of binding business and labor to commit to education and skills training. In allocating the resources over education and skills training (e.g., research funding, college establishment, financial support for VET), the democratic governments have had to take into account various political and social conditions (e.g., regional disparity) more seriously, while their authoritarian counterparts paid less attention to these factors. Nevertheless, there were no other social or political actors to replace the role of the state; neither business nor labor was interested in or capable of establishing the education and skills training system, due to the fragmented structure of business associations and labor unions as well as their prioritization of short-term economic interests, leaving the state itself as the only and key driver of strategy for development of human capital.

Human Capital Development Strategy after the 1997 Asian Financial Crisis

The 1997 Asian financial crisis exposed Korea to the destructive power of global financial capital and the limits of its old developmental strategy, accelerating the structural transformation of the economy. Structural changes have required not only Korea but other advanced industrial countries to seek out a different set of skills and knowledge for its workforce. Divergent approaches can be seen by countries in the search for a new model of human capital development. Approaches are highly con-

strained by institutional legacies of the labor market and education and skills training system in the national political economy (Isben and Thelen 2017; Iversen and Soskice 2019; Thelen 2014; Wren 2013). Some CMEs (e.g., Denmark) have attempted to modify existing institutional arrangements of their education and skills training system (although not fundamentally transforming or entirely abolishing them) based on political coordination among business, labor, and the state. Others (e.g., Germany) have rather maintained their traditional structure, but with modest change, because of strong policy preferences of large-sized firms and labor unions toward the existing human capital development model, while LMEs (e.g., the United States) have been taking advantage of market forces to promote change in education and skills training system (Carstensen and Ibsen 2019; Durazzi and Geyer 2020; Graf 2018; Isben and Thelen 2017; Iversen and Soskice 2019; Thelen 2014).

After the Asian financial crisis, Korea's response to these challenges has diverged from those of other advanced industrial countries in that the role of the state remains critical in the search for a new model of human capital development, but with no contribution from business or labor in the formation of education and skills training. Top policymakers prioritized investment in human capital development to create a virtuous cycle of rapid technological innovation, industrial upgrading, productivity increase, and economic growth. After a series of market reforms for a quick economic recovery, the center-left Kim Dae-jung government (1998–2002) advanced human capital development as the driving force of regaining Korea's competitiveness and growth in the international market (Park, Lee, and Ma 2017). By raising the rank of the education minister through restructuring of the government organization in January 2001, the government clearly indicated that its top priority was human capital development (National Archives of Korea 2001).

In the era of knowledge-based society and intensifying global market competition, the Kim government emphasized higher education as a way of enhancing Korea's status. Ambitiously announcing the Brain Korea 21 (BK 21) program in 1999, the Kim government aimed to improve the competitiveness of higher education, especially postgraduate education. The BK 21 program was designed to strengthen the research capabilities of the top graduate schools and to build up infrastructure for academic research through generous financial support packages ($1.2 billion over seven years), targeting a few "core" fields in natural sciences and engineering, such as electronics, mechanics, and bioengineering, most of which had served as the growth machine of Korea's export-oriented economy (Lee 2007, 12; National Archives of Korea 1999).[7] The

Kim government hoped to produce a large number of well-trained engineers and scientists with more advanced skills and knowledge, expecting them to contribute to industrial development and technological innovation of Korea's economy. Meanwhile, under democracy, several political considerations (e.g., regional allocation and disciplinary distribution) were taken into account in choosing a list of recipient graduate schools, given the strong social pressure for equity in education. This strategy—to develop more advanced skills and knowledge in natural sciences and engineering—was further extended at the second stage of the BK 21 program (2006–2012) during the Roh Moo-hyun government (2003–2008) and later in the BK 21 plus program (2013–2020) during the Park Geun-hye government (2013–2017) as one of the signature programs of the government's support for higher education in the fields of natural sciences and engineering.

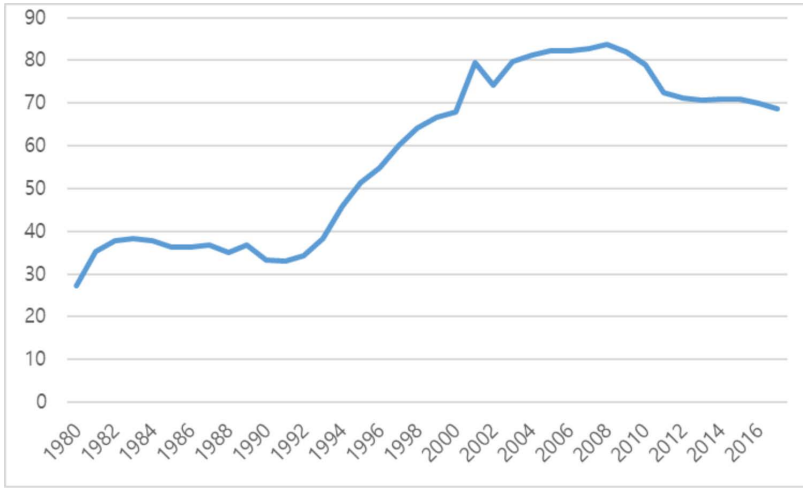
In a similar vein, the conservative Lee Myung-bak government (2008–2012) proposed the World Class University (WCU) program that would assist the top-tier universities to enhance the capacities of research and teaching, considering investment in higher education as the key determinant of Korea's economic growth and competitiveness (KMOEST and KISTEP 2008). In 2016, the conservative Park Geun-hye government (2013–2017) announced the Program for Industrial Needs Matched Education (PRIME) that would provide large financial support to a few four-year universities under the conditions that they develop departments and programs relevant to high industrial demand as well as reallocate college enrollment quota to engineering majors from other disciplines (mostly, humanities and social sciences) (*Joong-Ang Ilbo* 2016). Since the 1997 financial crisis, Korea's state has promoted higher education's improvement as the source of development and growth, focusing on the supply of high-skilled workforce in technology intensive sectors such as semi-conductors, electronics, automobiles, and biotech.

Despite the shift from manufacturing to the service economy, Korea's export-oriented manufacturing industry has remained the backbone of the economy. The importance of the export-oriented manufacturing industry in the national economy has continuously incentivized the state to upgrade VET in high schools and two-year vocational training colleges as the supply channel of semi-skilled and skilled workforce. However, its efforts to strengthen the skills training system, especially at high schools, did not work out as it had anticipated. The Kim Dae-jung government intended to link vocational high-school tracks with two-year vocational training colleges as a way to improve the quality of VET; but

such policy experiments resulted in the increase of college enrollment rate, while the proportion of high school students on the vocational track declined (see figures 1 and 2). The Roh Moo-hyun government (2003–2007) also emphasized both the development of specialized vocational high schools to reinforce VET and school-industry cooperation for the improvement of skills training, but was unable to reverse the trend (Park, Lee, and Ma 2017; see figure 1). With the strong policy goal of restoring VET at high schools by offering better job prospects for graduates, the Lee Myung-bak government launched the Meister High School program—that is, elite vocational high schools—in March 2010, which would quickly respond to the industrial demand in exchange for generous administrative support and financial subsidies (KMOEST 2010; Kuczera, Kis, and Worzburg 2009; Park 2013; Park, Lee, and Ma 2017). Similarly, emulating VET in Germany and Switzerland, in July 2015 the Park Geun-hye government proposed to introduce an Apprenticeship High School program primarily centered on training at workplaces.[8] At first, the focus of this program lied in mechanical engineering and materials, but was later extended to include information technology (IT) and service industries, which reflects the changing demand of industry in the transition to service economy and knowledge-based society (Cho, Kim, and Song 2017; KMOE 2016). However, none of these efforts succeeded in achieving the government's policy goals of revitalizing VET at high schools.

Since the early 2000s, the declining trend of high school students on vocational track has been more pronounced (see figure 1), while an increasing number of vocational high school graduates have decided to go on to college. The advancement rate of vocational high school graduates to higher education drastically increased from 19.2 percent to 62.3 percent between 1995 and 2004 (Yoon and Lee 2010). As of 2017, only half of all high school students (50.6 percent) on vocational track found jobs after graduation, although the percentage substantially improved after recording a low job placement rate of 16.7 percent in 2009 (Cho, Kim, and Song 2017). Structurally, jobs in large-sized manufacturing firms—which once had been available to vocational high school graduates—have disappeared in conjunction with the country's transition from manufacturing to service economy and increase of overseas production. The rapid expansion of the service economy seems to be further accelerating the declining popularity of vocational high schools, since a large proportion of their curriculum still focuses on skills more pertinent to the manufacturing industry (Yoon and Lee 2010).

Figure 2. Korea's College Enrollment Rate (%)



Source: Korea's e-country index, "Enrollment and Advancement Rate."

In the realm of VET at two-year vocational training colleges, the Lee Myung-bak government introduced the World Class College (WCC) program in 2011, with a focus on high-quality vocational training (Park, Lee, and Ma 2017). In the following year, the Leaders in Industry-College Cooperation (LINC) program (for both two-year vocational training colleges and four-year colleges) was also introduced to facilitate collaboration between colleges and industry in technological innovation, stable supply of skilled workers for local SMEs, and sustainable regional economy (Kim 2016; Byun et al. 2017). While enhancing the quality of VET to some extent, its merit-based competition for financial resources enlarged the gap between the leading vocational academic institutions and the rest. The Park Geun-hye government combined VET at vocational high schools and two-year vocational training colleges with the National Competency Standards (NCS) as the national skills qualification system, hoping to establish appropriate evaluation standards of skill level for each worker, as opposed to evaluation based on school degree, and ultimately to build a capability-based society (Park, Lee, and Ma 2017). Nevertheless, such skills qualifications have not replaced level of education attainment as one of the most important hiring criteria in the Korean labor market.

Since the Kim Young-sam government's education reform in 1995, Korea has experienced transformation in its human capital development strategy, accelerating rapid expansion of higher education (including both two-year colleges and four-year universities). Most advanced industrial countries have also expanded tertiary education over the past few decades; however, CMEs with a strong vocational training system have experienced rather modest increase compared with LMEs centered on general education. Korea is an exceptional case in terms of its very rapid expansion of tertiary education.[9] As of 2017, Korea's population with tertiary education (25–34 age group) was 69.8 percent within the same age group, which was the highest percentage among OECD countries, followed by Canada (60.9 percent) and Japan (60.4 percent), whereas the OECD average was 44.5 percent (OECD Data, Population with Tertiary Education). This high proportion of tertiary education indicates that Korea's education and skills training system leans more so toward the LMEs centered on general education as opposed to CMEs centered on specific skills training.

Yet the rapid expansion of higher education has affected the decreasing rate of return on the investment in education and the mismatch between the levels of education qualifications and occupational requirements (Lee, Jeong, and Hong 2014; Yoon and Lee 2010). As of 2016, 69.8 percent of high school graduates went to college, while only 23.2 percent of job openings were relevant to college graduates, which led to a huge mismatch of skills in the labor market (Cho, Kim, and Song 2017). Korean workers with tertiary education (aged 25–34) earn, on average, 25 percent more than upper secondary education graduates, whose education premium is relatively small compared with those of other OECD countries (Kuczera, Kis, and Worzburg 2009). Similarly, Lee, Jeong, and Hong (2014) have demonstrated that the lower 20 percent of four-year university graduates and the lower 50 percent of two-year vocational training college graduates were paid much lower than high school graduates, which demonstrates the very weak effects of tertiary education on wage premium, especially for those in the lower tier of tertiary education.

After the 1997 Asian financial crisis, Korea's state has reinforced its emphasis on human capital development as the key determinant of rebooting the country's growth engine and economic competitiveness. The economic downturn, however, has further exacerbated the fragmentation of business and labor as well as enlarged the disparity along the lines of firm size and industry, making them far less interested in the development of the education and skills training system across firms

and/or industries. A few large-sized chaebol firms with financial and organizational resources have developed simultaneously in-house education and skills training system for technological innovation and recruited high-skilled workforce directly from the external labor market. As large-sized chaebol firms have moved toward more capital and technology intensive sectors and expanded to the service industry, they have reduced their hiring of skilled and semi-skilled workers in the manufacturing sectors. Meanwhile, a majority of SMEs have not been able to establish internal labor markets for skilled and semi-skilled workers, having difficulties in hiring and securing them. Overall, it is Korea's state that has continued to take policy initiative in searching for a new model of human capital development strategy in the era of structural transformation of the economy and intensified global market competition, although its political capacity to bind business and labor to build the education and skills training system has weakened, in conjunction with the political and economic challenges.

Conclusion

Korea's state advanced a human capital development strategy not only during the period of industrialization but also when faced with the pressures of democratization and globalization, although its policy tools have shifted from implementation of strict rules and regulations on education and skills training system to provision of administrative and financial incentives for students, parents, and academic institutions over the past few decades. It was able to more effectively utilize this developmental strategy during the period of industrialization, which allowed Korea to catch up to advanced industrial economies. However, Korea's state has been exposed to a different set of challenges for human capital development since its transition to democracy and more specifically while its economy confronted structural transition and intensified global competition. As illustrated, since the 1960s until today, the state has not been able to establish a set of education and skills training system based on social partnership with business and labor, because such investment in human capital development would require a much longer time horizon and greater political efforts. Although a series of political, economic, and social challenges have raised several fundamental questions regarding the sustainability of the existing education and skills training system, the state continues to take strong policy initiatives to cope with the challenges while also searching for alternatives. Given the weak role

(or absence) of business and labor in formulating such system under the new pressures the country faces, the state is going to play a more active role in searching for a human capital developmental strategy that can serve the goal of achieving economic growth and competitiveness, but ultimately with less success compared with the past. At the same time, in the process of rapid expansion of tertiary education and structural transformation of the economy, it will also need to solve the mismatch between workforce supply and demand in the labor market.

Notes

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1. World Bank (1993) has pointed out human capital development (e.g., education) in East Asia as the key determinant of its economic miracle.

2. As of 2017, Korea's youth unemployment rate (for those aged 15–24) was 10.3 percent, which is much higher than those of Japan (4.65 percent) and Germany (6.78 percent), but slightly lower than the OECD average (11.9 percent) (OECD, OECD Data, Youth Unemployment).

3. For details, see the following websites: The QS World University Rankings and the World University Rankings.

4. Held every two years, the World Skills International aims to encourage skills competition among young workers aged 17–22.

5. Korea's GDP per capita in 1960 was US$158.2 (current US$), which was lower than those of Ghana ($183), the Philippines ($254.4), and Japan ($479) (World Bank, Data).

6. The wage disparity along the lines of educational attainment was rather huge until the mid-1980s. In 1975, two-year vocational training college graduates and four-year university graduates received 1.362 times and 2.144 times higher wages than those of high school graduates, whose wage disparities declined to 1.109 times and 1.457 times by 2015, respectively (Korean Ministry of Labor, *Report on the Basic Wage Structure*, various years; recited from Park, Lee, and Ma (2017, 217).

7. The Kim government aimed to produce 2,000 PhDs per year and 14,000 PhDs in total during the period of the seven-year long program (1999–2005) (National Archives of Korea 1999).

8. The Apprenticeship High School program differs slightly from the Meister High School program: the latter focuses more on advanced skills training for students at schools as well as workplaces, while the former is based on training in workplaces. Nevertheless, they share similar goals of skills training at vocational high schools.

9. In Korea, the population with tertiary education for those aged 25–34 and for those aged 55–64 was 69.8 percent and 19.7 percent (as of 2017), respectively, whereas the OECD average for these two age groups was 43.1 percent and 26.5 percent, respectively, which illustrates more drastic expansion of tertiary education in Korea (OECD, OECD Data, Population with Tertiary Education).

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