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Innovative SMEs and Job Creation for Youth*

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I. Introduction: Why Innovative SMEs?

In 2018, Korea's youth employment indicators showed a slight improvement despite the fact that the nation's economic and employment indicators remained sluggish overall. In reality, however, youths are still trapped in a vicious cycle of low employment rates, delayed entry into the labor market, excessive preparation for employment, and the high unemployment rate felt by job seekers. These challenges facing youths are fundamentally owing to the dual structure of the labor market. In other words, the persistent problem of dual structure in the South Korean labor market has intensified among young job seekers the avoidance of seeking employment in SMEs and the mismatch between their career expectations and available jobs, resulting

in an over-emphasis on preparation for employment. Also, due to the limited entry into the primary labor market and the vulnerability of the intermediate labor market, there is an absolute lack of quality jobs available for young people (the majority with higher education), making it difficult for them to enter and transition into the labor market. Against the backdrop of these challenges, the analyses of this report are based on the perspective that the growth and expansion of innovative SMEs, which can contribute to improving conditions for quality job creation, is one of the fundamental and effective policy prescriptions that can address the youth unemployment problem as well as the problem of the dual structure of the labor market while enhancing the efficiency and performance of the economy and the labor market.

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Korea's SMEs account for an overwhelming proportion in terms of the number of businesses and employees but generally struggle with low productivity, poor wages and bad working conditions. The gap in job quality between large firms and SMEs is very large; for example, the value-added per capita of SMEs is only 1/3 of that of large corporations, and the labor cost per capita is also less than half that of large corporations. In addition, Korea's SMEs are generally very weak in technological competitiveness and have a very low survival rate compared to those in high-income countries. However, there exist considerable heterogeneity and differences among SMEs depending on their types and characteristics. Therefore, it is considered as an urgent task to identify which types and characteristics of SMEs contribute to outstanding performance in two aspects: technological competitiveness and job creation capacity, and to design a customized package policy for these SMEs so that they can create more high-quality jobs for young people.

As can be seen from the experience of high-income countries, SMEs' ability to innovate accumulates over the mid- to long-term, so it is desirable and effective to implement a strategy to support innovation capacity building in a staged approach. In other words, Level 1 SMEs (low-technology), depending on technology transfer without independent R&D capability, should be supported step-by-step to grow into Level 2 firms by improving their 'technology receptor capacity,' and some of these Level 2 SMEs should again be helped to develop into in-

novation-oriented SMEs (Yoon · Lee, 2004). Innovation activities including R&D are recognized as an indispensable factor to enhance the survival rate of SMEs and to ensure their sustainable growth by strengthening competencies to cope with changes in technology and market environment. In addition, SMEs with strong innovation activities are more likely not just to achieve outstanding business performance and enhance competitiveness but also outperform rivals in terms of quantity and quality of employment. Furthermore, the growth and expansion of innovative SMEs will bear significance in that they go beyond just strengthening corporate competitiveness and creating high-quality jobs; they will ultimately contribute to the establishment of an efficient and fair economic environment.

The Korean government is carrying out diverse support projects in the fields of finance, technology, manpower, export, and start-up in order to address the weaknesses and problems of SMEs. In particular, it operates various certification systems with an aim to discover and support innovation-oriented SMEs. Unlike the past policy of pursuing indiscriminate support to all SMEs, the current policy follows "the select and focus" strategy and "the principle of competition", reflecting changes in the policy trends to foster the competitiveness and self-sufficiency of SMEs by allocating resources to firms with higher productivity (Hong, 2008). The Ministry of SMEs and Startups operates certification systems for innovative SMEs such as for the Inno-Biz, the Venture Firms, and the Main-Biz;

Table 1. Types of SMEs in Responding to Changes in Technological Environment

Type	Level 1	Level 2	Level 3
Response to Changes in Technological Environment	Non-active: lack and non-use of information on technological changes	Reactive: passive response or simply following technological changes	Proactive: predicting technological changes and developing proactive strategies
Types of Technology-diffusion Program	Adoption and adaptation of specific technologies	Improvement of the technology receptor capacity of firms	Building the innovation capacity of firms
Technology Level	Low-level technology	Technology follower	Technology frontier
Management Strategy	Outsourcing-dependent	Adaptive management	Strategic management

Source : Re-tabulated using the data from OECD (1997); Park, et al. (2001); Yoon · Lee (2004).

and provides support in various aspects such as technological development. Also, among the outstanding SMEs listed by the Ministry of Trade, Industry and Energy or the Ministry of SMEs and Startups, the Ministry of Employment and Labor has selected and provided support for the “small but strong” firms based on their employment capacity, technological capacity, and financial soundness since 2012. The number of innovative SMEs certified by the Ministry of SMEs and Startups has increased rapidly since 2001 to reach 51,322 (excluding redundancy) in 2016. Among them, the Venture Firms accounted for 50%, the Inno-Biz 27%, and the Main-Biz 23%. As will be discussed in detail later, it is evaluated that innovative SMEs have outperformed the other SMEs not just in total employment and youth employment but also in terms of the volume of sales, operating profits, and R&D investment for many years.

With these differences in mind, this report analyzes whether high-growth enterprises and innovative SMEs perform better in terms of management and technological performances and job creation performance—in particular, youth employment—compared to large corporations and SMEs without any certifications. Also, we conduct an in-depth survey of innovative SMEs to identify their work organization, skills formation, wage and working conditions, and contribution to youth employment. In this report, we will define “innovative SMEs” as companies with one of the two certifications, the Venture Firms and the Inno-Biz. Finally, based on the results of empirical analysis and case study, policy improvement directions for the development of innovative SMEs and the enhancement of their job creation capacity will be suggested.

II. Characteristics of High-growth Enterprises and Youth Employment

First, in order to examine the characteristics of high-

growth enterprises as measured by employment and their contribution to youth employment, corporate panel data was constructed by combining the employment insurance DB, the list of innovative SMEs, and the Korea Enterprise Data during the period 2011-2017. Two widely accepted methods were used to define “high-growth enterprises”. First, the OECD (2009) method is to define “high-growth enterprises” as enterprises with average annualized growth in the number employees greater than 20% per year, over a three-year period, and with ten or more employees. Second, the OECD (2002) method is to define the top x% of enterprises based on percentiles of employment growth rate among those that operated during a certain period.

In this report, using the OECD (2009) method, we defined companies with average annualized growth in the number employees greater than 20% per year, over a three-year period, as “high-growth enterprises”. In addition, those with average growth of 10-20% were classified as “semi-high-growth enterprises,” those with average growth of 0-10% were defined as “growth enterprises,” and the rest were set as “non-growth enterprises”. <Table 2> shows that, as of 2017, the share of high-growth enterprises among all sample firms with ten or more employees (242,807 firms) was 5.2%, which was similar to that of the U.S., slightly higher than those of European countries such as Sweden and Denmark, and lower than those of fast-growing countries such as Brazil. Meanwhile, the employment growth rates of innovative SMEs (the focus of this report)—firms with the Inno-Biz or the Venture Firms certifications—were generally higher than those of firms without any certifications. In the case of the Venture Firms, high-growth enterprises and semi-high-growth enterprises both accounted for 14%, more than twice as high as that of firms without any certifications. In the case of the Inno-Biz firms, the proportion of those with high employment growth was lower than that of the Venture Firms but slightly higher than that of firms without any certifications. In short, data showed that, despite the slight

Table 2. Distribution of Enterprises by Employment Growth: 2017

(Unit : %)

Enterprise Type	Total	High-growth Enterprises	Semi-high-growth Enterprises	Growth Enterprises	Non-growth Enterprises
All	100.0	5.2	8.7	26.9	59.2
Venture Firms with Certifications	100.0	13.7	14.0	26.9	45.4
Inno-Biz with Certifications	100.0	5.4	12.0	33.7	48.9
Firms without Any Certifications	100.0	4.7	8.2	26.5	60.6

Source : Employment Insurance DB, as of the end of 2017.

differences among certification types, innovative SMES such as the Inno-Biz firms or the Venture Firms tended to have higher employment growth rates.

In analyzing the distribution of industries according to the level of employment growth rate, it was found that high-growth enterprises were mostly distributed in publishing, video, broadcasting, communications and information services; and professional, scientific and technical services, meaning that the proportion of firms with a rapid increase in employment is greater in new technologies and new industries than in traditional industries. In the manufacturing, agriculture, forestry and fishery industries, the employment growth rate was not that high due to a high proportion of non-growth enterprises. By region, the proportion of high-growth enterprises and semi-high-growth enterprises was high in Seoul, Gyeonggi and South Chungcheong province, while that of non-growth enterprises was relatively high in other metropolitan areas.

We also analyzed the financial measures, the employment volume and the number of years in business according to the level of employment growth rate (See Table 3). In total sales and total assets, the high-growth enterprises group contributed a small percentage and the number of years in business was also shortest. The R&D spending of the high-growth group and the semi-high-growth group was small in absolute terms, and their R&D spending as share of sales or assets was smaller than that of the growth enterprises group but higher than the non-growth group's R&D spending share. In other words, enterprises with

high employment growth rate usually belong to an enterprise group with a small size of employment, sales and assets, and limited years in business, but it can be observed that their sales and employment rapidly increase based on aggressive R&D investment. Therefore, it can be said that R&D investment—a key element of innovation activities—is one of the important contributors to employment creation by achieving sustaining growth of the enterprise. Even from the perspective of youth employment (Table 3), it is clear that companies with a higher employment growth rate are likely to have a higher proportion of youth employees in total employment. Results of regression analysis that takes into account several factors affecting the proportion of youth employment also confirms the same tendency.

Next, using the OECD (2002) definition, we grouped enterprises based on percentiles of employment growth rate during the period 2014-2017 and analyzed each group's contribution to total employment and youth employment. Looking at the employment growth rate and the changes in the number of employees over the past three years (Table 4), it was observed that a small group of firms with a very high employment growth rate led the overall employment growth, while a large group with low employment growth rate showed stagnation or a big decline in employment. The employment growth rate of the top two groups (p100 - p95, p95 - p85), accounting for approximately 15% of the sample firms, exceeded one million persons during the three-year-period, representing

Table 3. Characteristics of Enterprises by Level of Employment Growth and Their Proportion of Youth Employment: 2017

		High-growth Enterprises	Semi-high-growth Enterprises	Growth Enterprises	Non-growth Enterprises
Characteristics	Total Assets (billion KRW)	34.6	51.0	132	105
	Total Sales (billion KRW)	29.1	32.1	59.4	38.4
	R&D spending (million KRW)	345.5	320.7	1,204.2	353.8
	No. of years in business (years)	8.3	10.3	12.2	11.0
Proportion of Youth Employees	15-24 years (%)	11.68	10.48	8.01	5.76
	15-29 years (%)	26.24	23.8	19.77	15.66
	15-34 years (%)	37.63	35.02	30.85	26.68

Source : Employment Insurance DB, as of the end of 2017, Korea Enterprise Data (KED).

Table 4. Employment Growth Rate and Changes in the Number of Employees Recorded by Groups of Firms Based on Percentiles of Employment Growth Rate: 2014-2017

Groups of Firms Based on Percentiles of Employment Growth Rate	Total Employment			Youth Employment (15-29 years)		
	Annual Rate of Growth (%)	Changes in the Number of Employees (person)	Percentage in the Employment Growth Groups (%)	Annual Rate of Growth (%)	Changes in the Number of Employees (person)	Percentage in the Employment Growth Groups (%)
Total	3.0	480,636	100.0	-2.3	-71,926	100.0
p100-p95	64.1	589,125	24.4	54.3	157,016	30.4
p95-p85	28.6	481,749	19.9	21.5	112,646	21.8
p85-p75	14.8	822,860	34.1	12.3	191,836	37.2
p75-p35	1.4	521,173	21.6	-3.7	54,419	10.5
p35-p0	-10.3	-1,933,822	-	-22.2	-587,843	-

Note : The survey was taken on a total of 892,561 firms that operated during the period 2014-2017.

Source : Employment Insurance DB (as of the end of 2017).

Table 5. Average Values and Changes in Major Variables of Groups of Firms Based on Percentiles of Employment Growth Rate: 2014-2017

2017		Groups of Firms Based on Percentiles of Employment Growth Rate					
Variables		Total	p100-p95	p95-p85	p85-p75	p75-p35	p35-p0
Employment Size (person)	2017	16.2	14.8	10.8	21.1	15.9	16.3
	2014	15.6	3.1	4.7	13.7	14.4	22.6
Number of years in business (years)		9.3	6.1	7.3	9.1	9.6	10.2
Annual Rate of Growth (%)	Total Sales	11.2	72.8	32.5	17.8	6.8	-2.5
	Operating Profits	3.6	25.1	26.2	14.5	4.5	-9.5
	R&D	10.2	40.3	29.2	18.3	9.4	-0.4

Source : Employment Insurance DB, as of the end of 2017, Korea Enterprise Data (KED).

44.3% of the total employment growth during the same period. This pattern is also observed in youth employment. During the period 2014-2017, the total employment of young people (15-29 years) decreased by about 72,000 persons, but the top two groups saw a rise in employment

by about 270,000 persons, accounting for 52.3% of total employment growth, and significantly offsetting a large-scale decline in youth employment recorded in the bottom group.

Table 5 confirms the characteristics of the top groups

that lead the overall employment growth: the majority of companies have small employment size and relatively short number of years in business. As for their management performance, the top groups tend to have better performance in total sales, operating profits, and R&D spending. This can be interpreted that their rapid employment expansion was possible based on excellent management performance. These results are also consistent with our earlier analysis using the OECD (2009) definition of high-growth enterprises.

III. Contribution of Innovative SMEs to Total and Youth Employment

In this part, the contribution made by innovative SMEs to overall employment growth will be analyzed (Table 6). In the past three years (2014-2017), large companies with 300 or more employees accounted for 70% of the total employment growth (approximately 480,000 persons), while SMEs with less than 300 employees accounted for less than 30%. During the period 2011-2014, the relative contribution sizes of the large companies and SMEs are similar to that in 2014-2017. Within SMEs, innovative SMEs—including the Inno-Biz and the Venture Firms—contributed 70-80% to the employment growth of all SMEs over the past six years (2011-2017), taking the lead in employment growth of the SME sector. However, there exist differences in their contribution to employment growth by types of innovative SMEs. The Inno-Biz firms achieved relatively decent employment performance in 2011-2014 compared to all SMEs, but their employment creation results were not good enough in 2014-2017. On the other hand, the Venture Firms achieved remarkable employment growth rates—close to that of large corporations—during both periods (2011-2014 and 2014-2017), thus contributing significantly to the total employment growth and that of the SME sector.

Table 7 shows the changes in overall youth employment, and the number of young employees declined by about 70,000 in 2014-2017 and by about 200,000 in 2011-2014. However, different patterns are observed between different types of SMEs and between SMEs and large corporations. Youth employment grew at a very high rate in the case of large firms with more than 300 employees, but it was reduced in SMEs as a whole. Such difference seems to reflect in part the avoidance of seeking employment in SMEs among young people due to the dual structure of the labor market.

Differences are also seen between different types of SMEs. The increase of youth employment is relatively high in the Inno-Biz firms, the Venture Firms, and firms with 10-299 employees, while most of the decrease in youth employment occurred in particularly small businesses with 1-9 employees. In terms of contribution to youth employment growth by type of SMEs, the average annual growth rate of youth employment in the Inno-Biz in 2014-2017 was 8.4%, generating about 10,000 new employees; while that of the Venture Firms was 12.6%, contributing to the growth of about 27,000 young employees during the same period. Looking at the employment generated by the Inno-Biz and the Venture Firms combined (innovative SMEs as a whole, excluding redundancy), youth employment increased by about 29,000 persons during the recent three years, about 1.8 times the increase in youth employment recorded by large corporations (about 16,000 persons). In a nutshell, although it is true that large corporations contribute more to total employment, innovative SMEs have played a more important role in generating youth employment.

Based on the analysis so far, it can be concluded that innovative SMEs are an important contributor to youth employment creation along with large companies. Although further analysis is needed in the future, most jobs in innovative SMEs are partly in the primary labor market or the intermediate labor market, which is close to the pri-

Table 6. Employment Growth Rate and Changes in the Number of Employees: 2011-2017

Type of Firms	Changes in Employment 2014-2017			Changes in Employment 2011-2014		
	Percentage of Firms (%)	Annual Rate of Growth (%)	Changes in the Number of Employees (person)	Percentage of Firms (%)	Annual Rate of Growth (%)	Changes in the Number of Employees (person)
All	100.0	3.0	480,636	100.0	2.6	734,478
Inno-Biz Firms	1.91	1.58	46,888	2.23	7.26	103,191
Venture Firms	2.98	8.26	103,640	2.45	12.32	105,925
Inno-Biz + Venture Firms	3.95	6.26	114,858	3.61	10.04	146,107
1-299 employees	99.47	2.94	136,319	99.41	2.57	206,150
300 employees or more	0.53	8.55	344,317	0.59	13.64	528,328

Source : Employment Insurance DB (as of the end of 2017), Enterprise DB by the Ministry of SMEs and Startups.

Table 7. Changes in Youth Employment by Type of Firms: 2011-2017

Type of Firms	Changes in Employment 2014-2017			Changes in Employment 2011-2014		
	Percentage of Firms (%)	Annual Rate of Growth (%)	Changes in the Number of Employees (person)	Percentage of Firms (%)	Annual Rate of Growth (%)	Changes in the Number of Employees (person)
All	100.0	-2.3	-71,926	100.0	-6.4	-199,293
Inno-Biz Firms	1.9	8.4	10,861	2.2	8.6	4,540
Venture Firms	3.0	12.6	27,498	2.5	11.1	12,327
Inno-Biz + Venture Firms	3.9	11.1	29,090	3.6	9.2	9,222
1-299 employees	99.4	-2.8	-87,965	99.4	-6.9	-267,006
10-299 employees	24.4	9.5	31,333	25.7	-5.4	-100,352
300 employees or more	0.5	31.5	16,039	0.6	24.0	67,713

Source : Employment Insurance DB (as of the end of 2017), Enterprise DB by the Ministry of SMEs and Startups.

Table 8. Average Values and Changes in Major Variables by Type of Firms: 2014-2017

2017		Inno-Biz	Venture firms	Inno-Biz/ Venture firms	1-299 employees	10-299 employees	300 employees or more
Employment Size in 2017 (person)		49.3	29.1	33.9	10.6	32.7	1077.2
Number of years in business (years)		13.8	9.0	10.4	9.3	10.9	14.7
Annual Rate of Growth (%)	Total Sales	3.2	16.8	12.7	11.2	12.3	8.6
	Operating Profits	2.3	14.8	11.2	10.7	11.9	24.4
	R&D	38.1	61.1	50.7	33.6	37.9	34.2

Source : Employment Insurance DB (as of the end of 2017), Korea Enterprise Data (KED), Enterprise DB by the Ministry of SMEs and Startups.

mary labor market, so innovative SMEs entice young job seekers with their own attributes. As the growth of these innovative SMEs has proven to be effective in generating quality jobs for young people, it would be necessary to keep in mind in the future design of SME support policy

to follow the “select and focus” strategy to systematize and strengthen policy measures for innovative SMEs or those that have similar qualifications to ensure the sustainability of employment creation.

Finally, among innovative SMEs, it is noteworthy that

the Venture Firms have shown particularly excellent performance in employment growth despite the fact that their employment scale is not so big and more than half of them have been in business for 3-5 years, or 6-9 years. Their business results and financial performance are also noteworthy. They continuously achieved excellent results in major business and financial indicators such as total sales, operating profits, and R&D spending during the period of six years (2011-2017), and it is suggested that their rapid employment expansion was possible based on excellent business performance. These characteristics suggest that when start-ups evolve to scale-ups after about 5-7 years of growth period, their management and job creation performance will begin to bear fruit in earnest; thus it would be necessary to fully consider the significance and importance of supporting scale-ups when the government looks for ways to improve the current start-up support policies.

IV. Case Studies of Innovative SMEs

Focusing on the firms certified by the government including the Inno-Biz, the Main-Biz, the Small Giants, etc., we selected five innovative SMEs in the metal manufacturing industry and conducted an in-depth survey of their background of business growth, work organization, job characteristics, skills requirements, working conditions, and the status of manpower supply. The five firms were not venture companies focusing on the development of new products but those that evolved from traditional SMEs into innovative SMEs by initially securing technology by introducing or adopting it from foreign countries and gradually developing their own technological competitiveness. Against such a backdrop, the companies had a firm ground for competitiveness in product development, innovation, and processing technology, and were placed in position to provide quality jobs to highly-skilled

production workers. However, it should be pointed out that, since the case companies are not venture firms, it is not possible to generalize the survey results to the whole innovative SMEs.

The case firms rely on a batch-oriented production system focused on metal processing and have a competitive edge in sophisticated processing technologies. Moreover, due to the nature of SMEs where the division of labor is limited and it is not easy for machines to replace the work of skilled workers, all of the case firms operate their business with heavy reliance on highly-skilled workers. In most cases, it takes several years for an employee to reach an independent level of skill. For this reason, the case companies are very active in hiring young workers. Their working conditions are comparatively good compared to other SMEs, with the average wage of about 28 million-35 million KRW and not-so-long working hours. Also, since it is easy to not only acquire advanced technical skills but also utilize them in the future, employees benefit in terms of re-employment capability and career management. The production-related jobs are considered as decent jobs to attract young people because of their relatively good working conditions although their weaknesses lie in a high level of job difficulty and physical fatigue.

Most of the case companies do not experience shortage of young workers in office jobs and R&D positions, but face difficulties in hiring young people in production jobs, which can be confirmed by a high turnover rate of young workers in those jobs. Because the competitiveness of these companies lies in their skills, the lack of young workers in production jobs is posing a fundamental threat to corporate sustainability. Therefore, without addressing this problem, there is a high possibility that the survival of innovative SMEs will be jeopardized. The shortage of young workers may be caused by the characteristics of production jobs, such as the difficulty to acquire the necessary skills and the need to deal with physical fatigue, as well as young workers' avoidance of seeking employment

<Table 9> Case Studies of Innovative SMEs: Results

Item	Company A	Company B	Company C	Company D	Company E
Industry	Cutting Tools	Automation/ Machine Parts	Automobile/ Machine Parts	Auto Parts	Semiconductor Equipment Components
Whether or not using a subcontractor	Independent	Independent	Subcontractor	Subcontractor	Independent
Innovation Certification	Inno-Biz / Small Giant	Inno-Biz / Small Giant	None	Inno-Biz / Main-Biz / Small Giant	Inno-Biz
Type of Innovation	Product Innovation	Product Innovation Combined with Manufacturing Technology	Product Innovation Combined with Manufacturing Technology	Focused on Process Innovation	Product Innovation Combined with Manufacturing Technology
Skills Requirement	Not high	Very high	Pretty high	Assembly: Low / Processing: High	Very high
Average Wage	29 million KRW	28 million KRW	30 million KRW	28 million KRW	35 million KRW
Youth Employment	Labor shortage	Labor shortage	Labor shortage	Labor shortage	No Difficulties in Hiring

in small and medium-sized manufacturing businesses due to the salary disparity between large corporations and SMEs. In addition, the poor living environment and the lack of cultural facilities around the industrial complexes where the case firms are located were also found to be factors causing the shortage of young workers. Some argue that the recent hike in the minimum wage deprives young job seekers of motivation to work at SMEs by reducing the wage gap between general and innovative SMEs. Interestingly, one of the case firms had no problem with the recruitment of young people, and it has positioned itself as an attractive workplace among youths thanks to its high wage levels, skills requirements, short working hours, open communication with workers, flexible and relaxed management style and organizational culture, and continuous efforts to create working environments that are similar to the services sector.

V. Directions for Policy Improvement

We derive the following policy implications from the results of the empirical analysis and case studies conducted so far. First, the case studies confirmed that innovative

SMEs are a potential generator of decent jobs for young people. The empirical analysis also confirmed that innovative SMEs play an important role in creating youth employment along with large corporations. During the period of three years from 2014 to 2017, innovative SMEs saw an increase of youth employment by about 29,000 persons, which is about 1.8 times the increase in youth employment recorded by large corporations (about 16,000 persons). In reality, traditional SMEs are placed on the margin and thus in need of policy support, but their low performance make it difficult for them to offer good job positions to young job-seekers. Therefore, it is imperative to shift policy directions to promote the growth of innovative SMEs that have the potential to create relatively high quality jobs. It would be necessary in the future design of SME support policy to follow the “select and focus” strategy to systematize and strengthen policy measures for innovative SMEs or those that have similar qualifications. In addition, there is a need for policy efforts to substantially improve coordination in policies design among government ministries dealing with innovative SMEs such as the Ministry of SMEs and Startups and the Ministry of Employment and Labor to create synergy of SMEs supporting policies.

Second, in implementing the government projects of matching young job-seekers with SMEs (The Naeil Chaum Deduction Program, Additional Youth-Employment Incentives, Industrial Technical Personnel System, etc.), it is necessary to put more emphasis on supporting innovative SMEs. Although the current government support programs can temporarily attract young people to SMEs, young workers are likely to leave traditional SMEs with low productivity for other firms when the support program is terminated. On the other hand, young workers in innovative SMEs are likely to stay after a period of time required for skills formation. Even if they choose to leave the company, they are likely to continue to seek employment in small and medium-sized manufacturing sector because they can utilize the skills they have learned. In this regard, support for innovative SMEs will not only increase the job creation effect for youths but also enhance SMEs' productivity and technological competitiveness.

Third, among innovative SMEs, the Venture Firms have shown particularly excellent performance in management and employment creation and many of them have been in business for 3-8 years. This has important implications for setting the directions and framework when developing support policies for the Venture Firms. Start-ups evolve to scale-ups after some years of growth period, and their management and job creation performance will begin to bear fruit in earnest during the evolution. Therefore, while it is important to support the creation of new start-ups, it would be more effective to provide support for scale-ups considering their job creation effect and sustainability. In fact, some high-income countries such as the U.S. and the U.K. are shifting the focus of supporting programs from start-ups to scale-ups with an aim to boost economic growth and job creation. In view of such trend, it would also be practical for us to adjust the current framework of concentrating support for new start-ups with only a couple of years in business, and move toward expanding support for the scale-ups that can generate quality jobs.

Fourth, it is necessary to strengthen policies to facilitate workplace innovation in innovative SMEs. As these SMEs rely on highly-skilled manpower, they are in a good position to implement and reap results from the government's workplace innovation support policies. At the same time, by encouraging the participation of young people in workplace innovation, they can help the youth gradually adjust to the manufacturing work culture. In addition, it is necessary to bring about the improvement of organizational culture at innovative SMEs. In particular, young people tend to have a feeling of objection toward the tough and demanding work culture created by their seniors and supervisors and find it hard to adopt such culture. Although this type of organizational culture exists in all SMEs, there is a greater need in innovative SMEs for improvement in existing culture to utilize young people with advanced skills. At the same time, it is urgent to change not only the inside of manufacturing plants but also the surrounding environment to be more suitable for the younger generation. The lack of living and cultural facilities and the dull and gloomy environment around the industrial complexes, in which most manufacturing plants are located, serve to reduce the attractiveness of innovative SMEs among young people. Therefore, policy support is needed to create adequate residential and living spaces around the industrial complexes.

Fifth, with regard to addressing the problem of labor shortage at innovative SMEs, more attention should be given to the contrast between small and medium-sized manufacturing and small and medium-sized services, rather than the contrast between large corporations and SMEs. This is because, while it is difficult for SMEs with limited resources to compete with large companies in recruiting personnel, it would be easier to fill labor shortages in small and medium-sized manufacturing businesses by competing with the small and medium-sized services sector. In particular, the recent development and application of technologies related to the 4th Industrial Revo-

lution have created technological requirements enabling more comfortable job descriptions and working environment. Thus, efforts should be made to create more pleasant and safer jobs and better working environment by

actively utilizing these technologies. To that end, not only innovative SMEs themselves should put forth an effort but also the government needs to provide active support for them.

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