Ⅲ. In-depth Analysis

Small and Medium-Sized Enterprises in Korea: Current Conditions and Directions for Improving SME Support Policies

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KEY TAKEAWAYS

1. **Small and medium-sized enterprises (SMEs) are widely regarded as a core pillar of economic growth and employment, contributing to industrial dynamism and the diffusion of innovation through multiple channels.**

2. **In Korea, there is a particularly pressing need for SMEs to play these roles.** SMEs account for 99.9 percent of all firms and 80.4 percent of total employment, forming the quantitative backbone of the economy. Against the backdrop of slowing potential growth and deepening economic polarization, the importance of SME innovation and growth has become even more pronounced. Moreover, in order to respond effectively to global megatrends—such as digitalization and decarbonization—SME scale-up is no longer optional but essential. In this context, innovation and growth in the SME sector are closely intertwined with price stability and financial stability, warranting continued monitoring and analysis from a central bank perspective.

3. **Despite their importance, however, Korean SMEs remain weak in terms of productivity and economic dynamism.** Labor productivity in manufacturing SMEs stands at approximately 32 percent of that of large firms, well below the OECD average of 55 percent, while capital productivity has also declined in recent years. Stagnation in the transition from SMEs to mid-sized firms, declining entry and exit rates, and a rising share of zombie firms—from 12.6 percent in 2012 to 18.0 percent in 2024—suggest that the SME sector has yet to function as a qualitative engine of aggregate growth.

4. **While government policy support is realistically essential for enhancing the growth and innovation capacity of SMEs and has achieved some measurable outcomes in Korea, there remain areas where it falls short.** In particular, policy support has contributed to higher sales and employment and lower exit probabilities, thereby improving short-term firm survival. However, such support has not sufficiently translated into improvements in productivity, profitability, or capital investment—key foundations for long-term growth. Moreover, policy support may increase the likelihood of firms becoming zombies, generating negative spillovers that undermine the performance of healthy firms. Heavy reliance on policy finance also appears to crowd out private-sector financing.

5 **These limitations in performance are closely linked to structural problems embedded in the design and implementation of the current SME support system.** As a result, the system has not been fully effective in identifying high-productivity, high-growth-potential SMEs or in enhancing economic dynamism through a virtuous cycle of entry, growth, and exit.

① **(Scale-dependent support criteria)** Current eligibility criteria rely primarily on sales-based size thresholds that are weakly correlated with productivity, resulting in a system that resembles broad-based support rather than effective targeting.

② **(Peter Pan syndrome)** SME eligibility criteria function as a policy threshold that separates firms subject to government support and regulation, discouraging firm growth and thereby weakening the growth ladder from small to mid-sized to large enterprises.

③ **(Insufficient Firm Exit Mechanisms for SMEs)** The lack of restructuring mechanism tailored to SMEs delays the timely exit of financially distressed firms, during which government support is inefficiently allocated.

④ **(Program Duplication and Policy Fragmentation)** Similar support programs across ministries and agencies overlap, while policy formulation, implementation, and delivery systems are fragmented, undermining overall policy effectiveness.

6 **Using a model-based analysis, this report shows that aggregate output could be increased by approximately 0.4–0.7 percent without expanding the overall support budget, simply by changing *who* is supported and *how* support is provided.**

① **(Shift from Sales-Based to Age-Based Criteria)** Shifting support eligibility criteria from sales-based measures to firm age reallocates support toward younger, more productive firms, increasing aggregate output by 0.45 percent. This estimate includes a 0.06 percent gain attributable to the mitigation of the Peter Pan syndrome.

② **(Improving Restructuring Efficiency)** Reducing restructuring costs and improving overall restructuring efficiency to levels comparable to those of the United States and Japan increases aggregate output by 0.23 percent and reduces the share of zombie firms by 0.23 percentage points.

7 **Going forward, SME support policies should, rather than prioritizing increases in the *quantity* of support—such as the number of programs or the overall budget—be refined to enhance firm-level productivity and business dynamism through improved targeting and incentive structures.**

① **(Refining Selection Criteria and Leveraging Private-Sector Capabilities)** Rather than relying primarily on size-based criteria such as sales and assets, it is necessary to adopt productivity and innovation capacity as core selection

criteria and to actively leverage private-sector expertise in evaluation and investment.

② **(Growth-Friendly Support System Design)** Complementary indicators—such as firm age—that do not induce the Peter Pan syndrome should be used in parallel, alongside strengthened stage-specific support and performance-linked incentives.

③ **(Establishing SME-Appropriate Restructuring Frameworks)** The restructuring framework should be strengthened to ensure the smooth functioning of *early identification of distress–voluntary restructuring–orderly exit*, enabling the swift rehabilitation of viable firms while ensuring the timely resolution of non-viable ones.

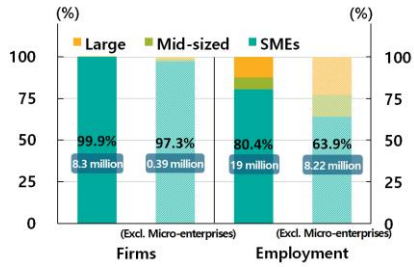
④ **(One-Stop Integrated Platform)** To reduce duplication across support programs and improve access to information, a one-stop integrated platform encompassing policy institutions and policy instruments should be established.

1. Background and Objectives

1. SMEs constitute the foundation of the Korean economy, accounting for an overwhelming share of both firms and employment. As of 2023, Korea had 8,298,915 small and medium-sized enterprises[1] (SMEs), accounting for 99.9 percent of all firms and employing 19.12 million workers, or 80.4 percent of total employment. Even excluding microenterprises[2], SMEs still account for 97.3 percent of firms and 63.9 percent of employment, while generating roughly 30-40 percent of sales, production, and value added (Figures 1.1-1.2). An examination of regional employment patterns shows that more than 80 percent of workers in mid-sized and large firms are concentrated in the Seoul metropolitan area, whereas employment in SMEs is more evenly distributed across non-metropolitan regions, indicating a much stronger linkage between SMEs and local economies (Figure 1.3).

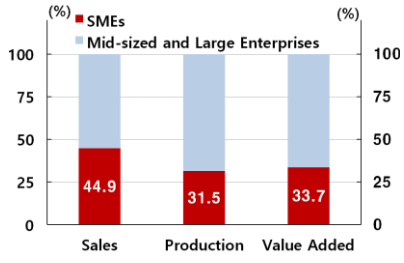
SMEs account for a substantial share of the Korean economy and are closely linked to local economies.

[Figure 1.1] Shares of Firms and Employment[1)]



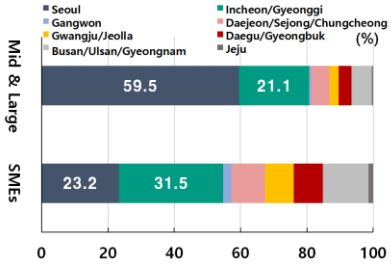
Note: 1) SME Basic Statistics (2023)
Source: Ministry of SMEs and Startups

[Figure 1.2] Shares of Sales[1)], Production, and Value Added[2)]



Notes: 1) As of 2023
2) Manufacturing (firms with 10 or more employees), as of 2022
Sources: Ministry of SMEs and Startups (MSS); Ministry of Data and Statistics

[Figure 1.3] Regional Distribution of Employment[1)]



Note: 1) As of 2022
Source: Korea Federation of SMEs

2. SMEs are not merely a group of small-scale firms; rather, they are widely regarded as a core pillar of aggregate growth and employment, enhancing industrial

[1] In this report, the term "small and medium-sized enterprises (SMEs)" refers to SMEs as defined by the statutory criteria, unless otherwise specified. For analytical purposes, employment-based criteria are also used in parallel. Specifically, domestic statistics apply a threshold of fewer than 300 employees, while international comparisons adopt the OECD standard of fewer than 250 employees. Further details are provided in Box 2. Meanwhile, distinct from SMEs, mid-sized enterprises are firms that fall between small and medium-sized enterprises and large corporations in terms of size. In Korea, mid-sized enterprises are also commonly referred to as middle market enterprises.

[2] It refers to small enterprises with fewer than 10 regular employees in manufacturing and related industries, or fewer than 5 regular employees in service industries and similar sectors.

dynamism, driving the diffusion of innovation, and mitigating regional imbalances through multiple channels.

- First, through the cycle of entry, growth, and exit, SMEs promote the reallocation of resources toward more productive uses, thereby raising aggregate productivity and strengthening economic dynamism (Aghion & Howitt, 1992; Haltiwanger et al., 2013).
- Second, SMEs act as key conduits of innovation by responding flexibly to industrial change and by experimenting with, absorbing, and diffusing new technologies[3](Acs & Audretsch, 1990). OECD (2015) emphasizes that, in an environment where innovation is concentrated among a limited number of frontier firms, the technological absorption capacity of lagging firms—particularly SMEs—is crucial for economy-wide productivity growth.
- Third, SMEs are closely linked to local economies and contribute to inclusive growth and balanced development by creating local jobs and promoting industrial diversification (Beck et al., 2005; OECD, 2019).

3. The importance of SMEs becomes even more pronounced in light of the structural conditions facing the Korean economy.

- Due to low fertility and population aging, the working-age population (ages 15–64) has already entered a phase of decline[4]. Rapid demographic shifts weaken the labor supply base, increase fiscal burdens, and act as a structural risk that constrains potential growth (Figures 1.4–1.6). At the same time, disparities between large firms and SMEs, the Seoul metropolitan area and non-metropolitan regions, and regular and non-regular workers are reducing economy-wide efficiency and exacerbating inequality. If these dual structures become entrenched, the risks of diminished growth potential and heightened social conflict will increase.
- Against this backdrop, the growth of SMEs can serve as a key pathway for restoring growth potential and alleviating structural challenges. Strengthening the innovative capacity of SMEs directly translates into higher economy-wide productivity and potential growth, while the expansion of high-potential regional SMEs contributes to balanced development by revitalizing industrial ecosystems and expanding local employment. Moreover, the creation of high-

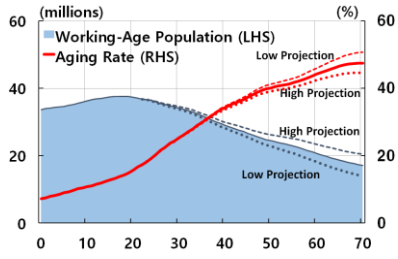
[3] Indeed, globally, firms that began as ventures or start-ups—such as Tesla and Spotify—are creating new engines of growth through innovation (see Box 3).

[4] According to the National Population Projections released by Ministry of Data and Statistics (2023), the population aged 15–64 peaked at 37.63 million in 2019 and is projected to decline to 18.64 million by 2065—roughly half of its peak level.

quality jobs and improvements in employment stability associated with SME growth strengthen household income foundations and stabilize living conditions, thereby helping to mitigate low fertility and enhance fiscal sustainability (Figure 1.7).

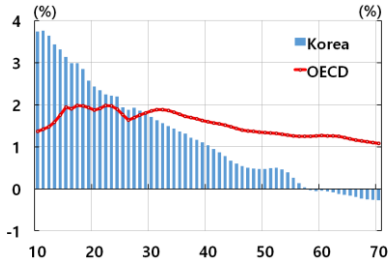
Demographic changes are expected to lower potential growth and increase fiscal burdens.

[Figure 1.4] Working-Age Population and Old-Age Dependency Ratio[1)]



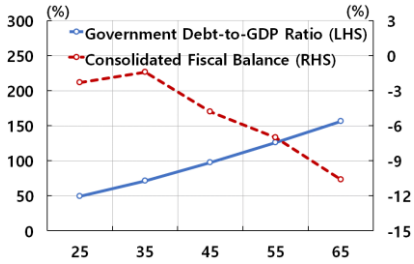
Note: 1) Population Projections (2023)
Source: Ministry of Data and Statistics

[Figure 1.5] Potential Growth Rate Projections[1)]



Note: 1) Baseline (Business-as-usual) scenario
Source: OECD (2025)

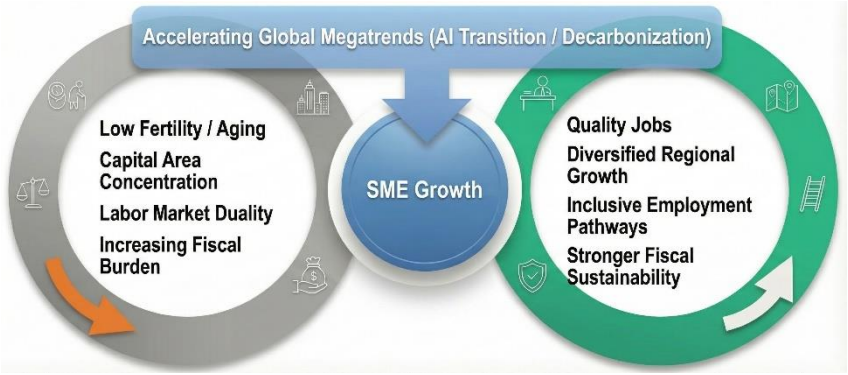
[Figure 1.6] Government Debt and Fiscal Balance[1)]



Note: 1) Baseline scenario
Source: Ministry of Economy and Finance (September 2025)

The growth of SMEs can serve as an important solution to addressing structural challenges.

[Figure 1.7] SME Growth and Structural Transformation



4. Beyond domestic structural factors, so-called "global megatrends"—including the ongoing digital transformation and advances in artificial intelligence (AI), the transition toward decarbonization, and evolving demographic and value shifts that are expanding demands for work–life balance—also constitute an important backdrop that calls for the growth of SMEs. Investments in data infrastructure, the adoption of automation and smart factories, workforce reskilling and the

strengthening of digital capabilities, equipment replacement and process improvements to reduce carbon emissions, and the introduction of ESG management all entail substantial upfront costs and sustained investment. Smaller firms, in particular, face greater difficulty in bearing these transition costs. In addition, maintaining work–life balance arrangements—such as flexible working hours and guaranteed parental and caregiving leave—as well as operating comprehensive welfare and compensation systems in a stable manner requires a minimum level of organizational capacity. As these global megatrends are unfolding rapidly worldwide, the growth and scale-up of SMEs are not a matter of choice but a necessary condition for Korea's sustainable growth and structural transformation.

5. In this context, growth and innovation in the SME sector also have important implications for price stability and financial stability. Lee et al. (2025) show that Korea's real equilibrium interest rate has been on a declining trend due to structural factors such as demographic change and slowing productivity growth. If high-potential, high-productivity SMEs grow into mid-sized firms through innovation, thereby strengthening economy-wide growth momentum, the scope for conducting monetary policy to achieve price stability and macroeconomic stability could expand[5]. In addition, as financial soundness in the SME sector improves and the share of distressed firms declines, allocative efficiency across the financial system would increase and the risk of financial distress at financial institutions would diminish, further reinforcing the foundations of financial stability.

6. Thus, while SMEs in Korea are highly important in terms of their quantitative presence and economic role, their growth and innovation potential is unlikely to be fully realized if left solely to market forces. Appropriate government policy support—including financial assistance, improvements in the institutional and regulatory environment, and support for restructuring—is essential. SMEs face difficulties in accessing finance in private financial markets due to scale limitations and information asymmetries. Early-stage start-ups and innovative SMEs[6], in particular, encounter severe financing constraints stemming from

[5] An increase in potential growth raises the natural rate of interest, thereby easing the constraint imposed by the effective lower bound on nominal interest rates and expanding the range within which monetary policy can adjust interest rates in response to economic conditions. Holston et al. (2017) provide empirical evidence that the decline in potential growth in major advanced economies has acted as a structural factor constraining the conduct of monetary policy by central banks.

[6] Innovative SMEs generally refer to firms that have achieved notable innovation outcomes in areas such as products, processes, or management practices. In Korea, firms are classified as innovative SMEs if they hold at least one

insufficient collateral and creditworthiness, as well as uncertainty regarding investment returns. Recent surveys likewise indicate that many SMEs identify difficulties in securing necessary funding as their most significant challenge[7] (Figure 1.8). In this context, government policy lending, credit guarantees, and technology-based finance play a key role in supplying liquidity to SMEs and alleviating information asymmetries (OECD, 2017; Caselli et al., 2019). Meanwhile, improvements in the institutional and regulatory environment, together with support for restructuring, are crucial for facilitating firm entry, growth, and innovation, thereby promoting efficient resource allocation and sustaining economic dynamism (Caballero et al., 2008; World Bank, 2015; OECD, 2019).

7. However, depending on their design and implementation, SME support policies can entail significant side effects and inefficiencies. Support that is overly focused on short-term survival can encourage the continued market presence of low-productivity firms, increasing the number of zombie firms and distorting resource allocation (Brown & Dinç, 2011; Chang et al., 2021). Support schemes based primarily on simple size indicators, such as sales, may also induce growth avoidance just below eligibility thresholds—the so-called Peter Pan syndrome. Moreover, excessive reliance on policy finance can, over the long run, weaken the screening and risk-management functions of private finance and hinder the development of alternative financing instruments (Jones & Kim, 2014; OECD, 2017; Figure 1.9)[8]. Accordingly, policy finance should be designed to serve as a catalyst for private finance; if it fails to stimulate new private investment, it may instead undermine market-based ecosystems (Cerqua & Pellegrini, 2014).

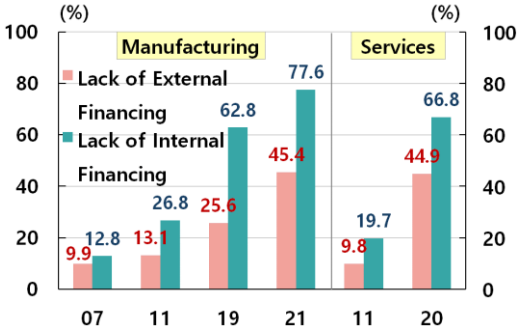
certification as a venture firm, a technology-innovative firm (Inno-Biz), or a management-innovative firm (Main-Biz). As of 2023, there were approximately 67,000 such firms, accounting for about 0.8 percent of all SMEs.

[7] According to the Survey of Start-up Firms (2024), 50.3 percent of founders identified a lack of funding as their most significant challenge. Similarly, the Survey of ICT SMEs (2024) reports that 62.9 percent of ICT SMEs gave the same response. Lee et al. (2024) further show that, since 2007, the share of young SMEs that perceive both external and internal financing constraints as factors hindering innovation has been steadily increasing.

[8] In addition, when government financial support is directed toward firms with elevated default risk, it may result not in an expansion of aggregate credit but rather in a transfer of credit risk to the government (Mankiw, 1986; Gale, 1991; Lucas, 2016). This effect is particularly pronounced in markets where private credit supply is interest-inelastic—that is, where lending does not increase despite interest rate cuts or policy support. Moreover, in environments with limited competition in financial markets, the competitive screening of efficient borrowers is weakened, giving rise to a structure in which credit risk is shifted onto the government.

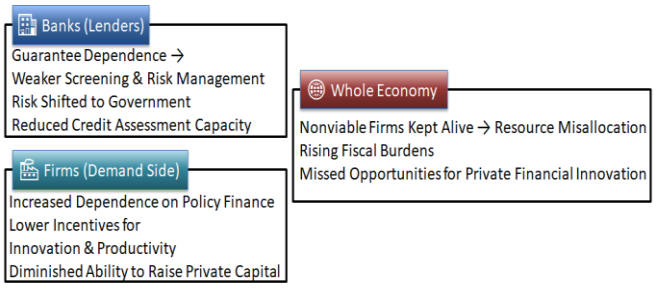
SME growth requires financial support, but excessive support can distort markets.

[Figure 1.8] Factors Constraining Innovation Activities of Young SMEs[1] (Share of Responses)



Note: 1) Firms in the bottom 20 percent by firm age
Source: Korean Innovation Survey; Lee et al. (2024)

[Figure 1.9] Market Distortions Arising from Excessive Reliance on Policy Finance



Source: Authors' compilation

8. Accordingly, no less important than the question of *how much* support to provide is the question of *which firms* to support and *how* that support should be delivered. Against this backdrop, this report conducts a comprehensive assessment of Korea's SME support system by examining whether:

① it appropriately identifies and effectively supports high-potential SMEs;

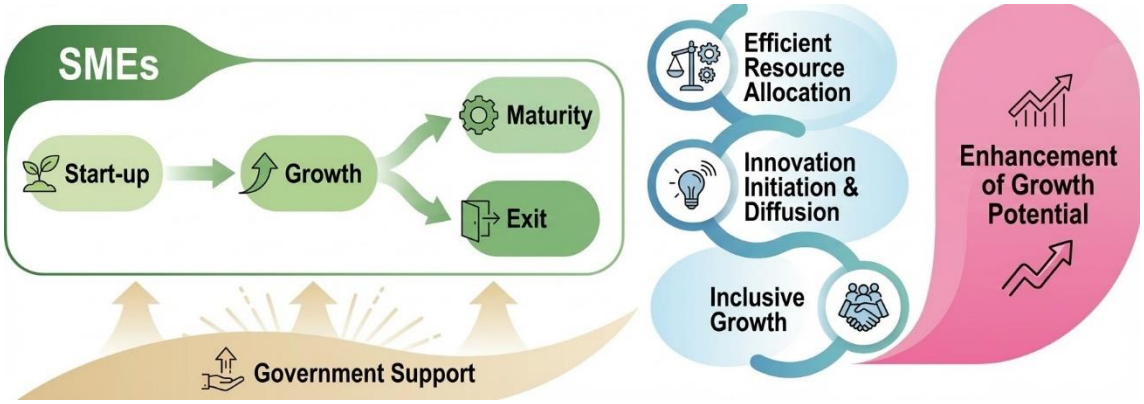
② it sustains economic dynamism through a smooth cycle of entry, growth, and exit;

③ further improvements are needed to enhance economy-wide growth potential.

To this end, Chapter 2 reviews the current state of Korea's SME sector, focusing on its development trajectory and structural limitations. Chapter 3 empirically evaluates the effects of existing SME support policies on sales, employment, productivity, and investment. Building on these findings, Chapter 4 diagnoses the structural problems of the current support system along four dimensions. Chapter 5 then employs a general equilibrium model to quantitatively assess changes in aggregate output and wages under alternative policy designs. Finally, Chapter 6 synthesizes the preceding analyses and presents directions for improving and refining Korea's SME support system.

With appropriate government support, the growth of SMEs translates into higher economy-wide growth potential.

[Figure 1.10] The Role of SMEs in Growth and Innovation

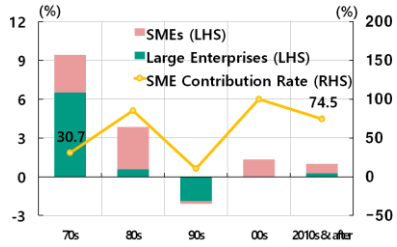


2. Current Conditions of the SME Sector

9. In the Korean economy, small and medium-sized enterprises have steadily expanded their role as a key pillar of job creation and economic growth. In terms of employment, SMEs have accounted for the majority of employment growth, while their contribution to real value-added growth has continued to rise, surpassing that of large firms during the 2010s (Figures 2.1–2.2). Compared with major advanced economies, Korean SMEs also exhibit a relatively high share in terms of employment, production, and value-added (Figure 2.3).

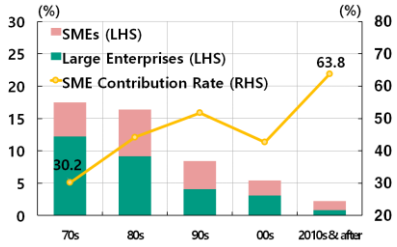
SME contribution to employment and value-added growth has expanded

[Figure 2.1] Contribution to Employment Growth[1),2)]



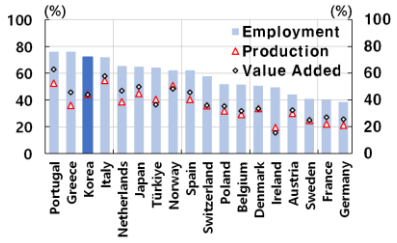
Note: 1) Average annual contribution to changes in employment in mining and manufacturing
2) SMEs defined as firms with 10–299 employee
Sources: Mining and Manufacturing Survey, Ministry of Data and Statistics

[Figure 2.2] Contribution to Real Value-Added Growth [1),2)]



Note: 1) Nominal values deflated by producer prices; average annual contribution
2) SMEs defined as firms with 10–299 employee
Sources: Ministry of Data and Statistics; Bank of Korea

[Figure 2.3] Economic Share of SMEs[1)] in Major Countries[2)]



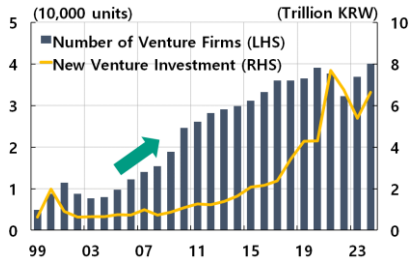
Note: 1) Firms with fewer than 250 employee
2) Manufacturing sector, 2022
Sources: OECD

10. Since the 2000s, the role of SMEs in innovation has strengthened markedly, driven by the growth of the venture industry and the expansion of R&D investment by SMEs. Between 1999 and 2023, the number of venture firms increased sharply from 4,934 to 36,959, while venture capital investment expanded from KRW 0.6 trillion to KRW 5.4 trillion (Figure 2.4). Furthermore, the number of venture firms with annual sales exceeding KRW 100 billion ("high-revenue venture firms") rose from 68 in 2004 to 908 in 2023, and the number of privately held firms valued at over KRW 1 trillion ("unicorn firms") increased from one in 2014 to 22 in 2022 (Figure 2.5). R&D expenditure by SMEs and venture firms also expanded significantly, reaching KRW 8 trillion and KRW 12.6 trillion,

respectively, in 2023—more than fourfold and eightfold increases compared to 2001 (Figure 2.6). These trends highlight the growing importance of SMEs as sources of new growth engines and innovation, beyond their traditional role as subcontractors or complementary firms.

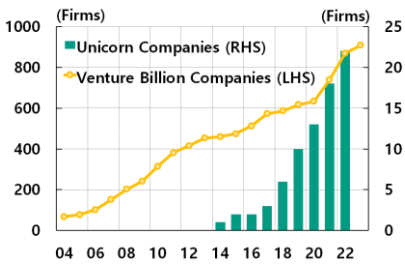
Rapid growth in the number of venture firms and investment since the 2000s **Significant expansion of R&D investment**

[Figure 2.4] Number of Venture Firms and Venture Investment



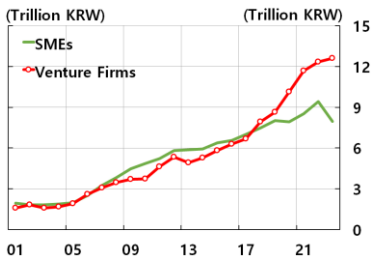
Source: Ministry of SMEs and Startups, Korea Venture Capital Association

[Figure 2.5] High-revenue Venture Firms[1] and Unicorn Firms[2]



Note: 1) Venture firms with annual sales exceeding KRW 100 billion
2) Privately held firms with enterprise value exceeding KRW 1 trillion
Source: Ministry of SMEs and Startups

[Figure 2.6] Trends in R&D Expenditure[1]



Note: 1) SMEs exclude venture firms
Source: Survey of Research and Development in Korea

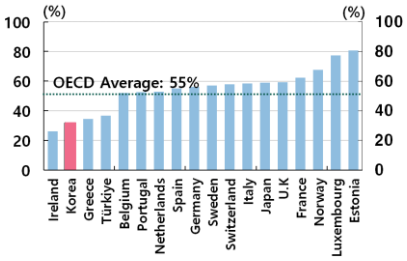
11. Despite this quantitative expansion, substantial challenges remain in enabling SMEs to function as a core engine of growth and innovation in the Korean economy.

12. First, the productivity gap between SMEs and large firms remains significant. Labor productivity of Korean SMEs in manufacturing is only about 32% of that of large firms, far below the OECD average of 55% over the 2011–2020 period (Figure 2.7). Moreover, between 2000 and 2023, the average annual productivity growth rate of SMEs was 2.1%, trailing that of large firms (3.3%), indicating a widening productivity gap (Figure 2.8). Capital productivity[9] has also shown a declining trend since 2016 (Figure 2.9). The Information Technology and Innovation Foundation (ITIF, 2025) characterizes this structure as a "two-speed economy," in which leading sectors (large firms) maintain world-class competitiveness, while lagging sectors (SMEs) experience stagnation in productivity and wages.

[9] Calculated by dividing value added by assets directly used in business activities (excluding bonds, stocks, etc.), this serves as a proxy variable for capital productivity.

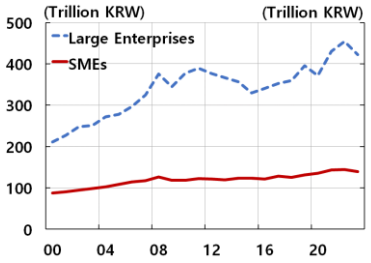
Labor productivity is lower than large firms, with widening gaps. **Capital productivity also declines.**

[Figure 2.7] SME[1] Labor Productivity[2] Relative to Large Firms



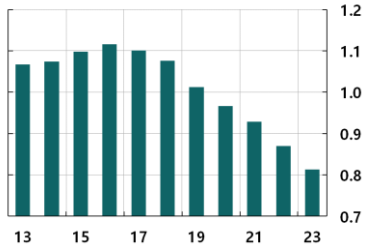
Note: 1) Firms with fewer than 250 employees
2) Real value added per worker, manufacturing average for 2011–2020
Source: OECD

[Figure 2.8] Trends in Manufacturing Labor Productivity[1]



Note: 1) Real value added per worker; SMEs defined as firms with fewer than 300 employees
Source: Korea Productivity Center

[Figure 2.9] Capital Productivity of SMEs[1),2)]



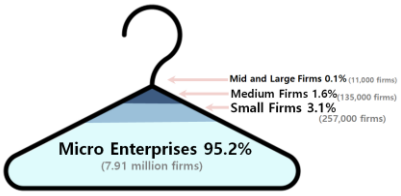
Note: 1) Value added divided by operating asset
2) Excludes microenterprises
Source: Authors' calculations using NICE data

13. Amid the persistent productivity gap with large firms, individual SMEs remain small in scale and offer relatively inferior working conditions. Firm size distribution data show that small-scale SMEs, including microenterprises, accounted for over 95% of all firms in 2023. Rather than a "pyramid-shaped" structure with a small number of large firms at the top and a broad base of mid-sized and small firms, Korea's corporate structure more closely resembles a "hanger-shaped" distribution with an excessively thick lower tier (Figure 2.10). Average SME sales amounted to approximately KRW 400 million in 2023—only about 0.1% of those of large and mid-sized firms—while operating profit margins remained in the low 3% range, substantially below those of larger firms (Figure 2.11). SME wages are roughly half the level of large firms, and gaps in working conditions—such as access to parental leave—remain large, contributing to young workers' reluctance to seek employment in SMEs[10] (Figure 2.12). This small-scale structure and poor working conditions constrain the inflow of skilled labor and weaken long-term growth potential.

[10] In terms of sales per firm for SMEs relative to large firms (manufacturing, 2022), major economies such as Germany (0.52%), the U.K. (0.58%), and Italy (0.50%) record higher ratios than Korea (0.1%). Furthermore, regarding wage levels per worker (manufacturing, 2022), countries like Germany (60.1%), France (74.3%), and Italy (69.9%) also surpass Korea.

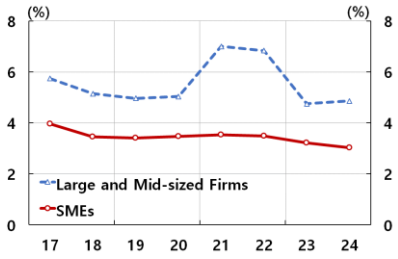
Dominance of small-scale SMEs **Lower profitability compared to large firms** **Inferior wages and working conditions**

[Figure 2.10] Distribution of Firms by Size[1)]



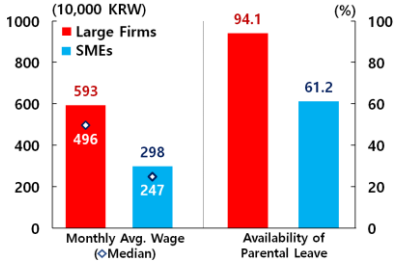
Note: 1) As of 2023
Source: Ministry of SMEs and Startups

[Figure 2.11] Operating Profit Margin[1)]



Note: 1) Operating profit as a share of sales
Source: Bank of Korea, Financial Statement Analysis

[Figure 2.12] Wages[1)] and Parental Leave[2)]



Note: 1) Monthly average, 2023
2) SMEs defined as firms with fewer than 300 employees
Source: Ministry of Data and Statistics; Ministry of Employment and Labor

14. Another critical issue is the malfunctioning of the growth ladder from SMEs to mid-sized enterprises. While the share of SMEs transitioning into mid-sized firms has remained stagnant at a low level, the number of firms reverting from mid-sized status back to SMEs has increased rapidly. Excluding microenterprises, the share of SMEs newly graduating to the mid-sized category stands at only about 0.2% of all SMEs (Table 2.1). In contrast, the number of firms reverting to SME status rose sharply from 197 in 2017 to 574 in 2023 (Figure 2.13). This pattern—where firms that have reached a certain scale subsequently avoid further scale-up and instead downsize or opt to stay within the SME category—suggests the spread of "growth avoidance" or the so-called "Peter Pan syndrome."

Stagnant transitions from SMEs to mid-sized firms, alongside increasing reversion from mid-sized to SMEs

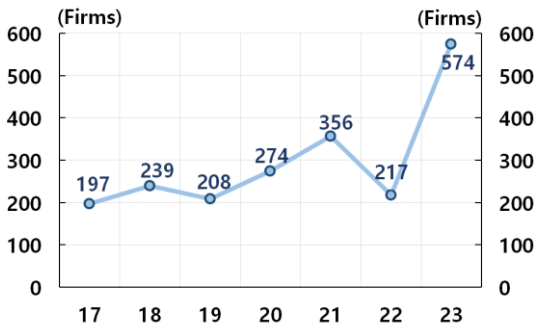
[Table 2.1] Entry Rate into Mid-Sized Firms

(Firms, %)

	New Mid-Sized Firms(A)	Total SMEs[1)](B)	Ratio(A/B)
2019	728	357,772	0.20
2020	1,009	361,790	0.28
2021	654	378,498	0.17
2022	528	386,008	0.14
2023	1,036	392,054	0.26

Note: 1) Excludes microenterprises
Source: Basic Statistics on Middle Market Enterprises, Basic Statistics on SMEs

[Figure 2.13] Number of Firms Reverting from Mid-Sized to SMEs

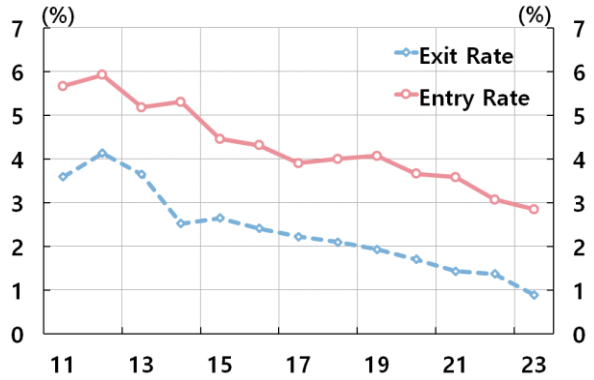


Source: Basic Statistics on Middle Market Enterprises

15. Signs of weakening dynamism in firm entry and exit are also evident, alongside a steady rise in the share of "zombie firms". Among SMEs with 10–299 employees, both entry and exit rates have declined since the 2010s, with exit rates in particular falling sharply from around 4% in 2012 to below 1% in 2023 (Figure 2.14). As profitability deteriorates and market exit is delayed, the share of zombie firms—defined as those with an interest coverage ratio below one for three consecutive years—has continued to increase (Figure 2.15). This indicates a structural entrenchment of low-productivity firms, hindering resource reallocation and industrial restructuring that are essential for aggregate productivity growth.

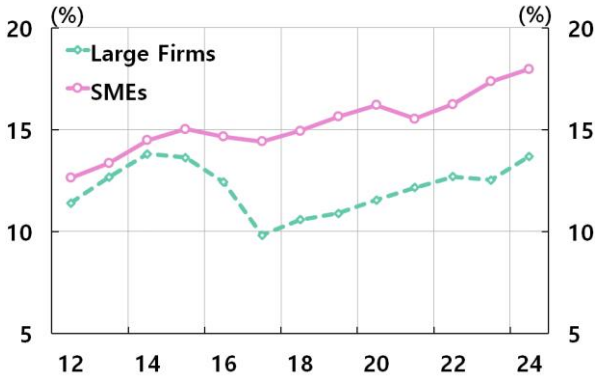
Declining entry and exit dynamism among SMEs and rising zombie firms

[Figure 2.14] SME[1] Exit Rate[2] and Entry Rate[3]



Note: 1) Firms with 10–299 employees
2) Number of exiting firms / active firms
3) Number of newly established firms / active firms
Source: Ministry of Data and Statistics; Business Demography Statistics

[Figure 2.15] Share of Zombie Firms[1]

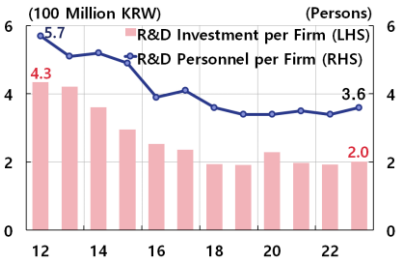


Note: 1) Firms with an interest coverage ratio below one for three consecutive years
Source: Value Search; Bank of Korea, Financial Stability Reports

16. While SME R&D activity appears to have expanded quantitatively, clear improvements in qualitative outcomes are difficult to identify. Despite the substantial increase in total R&D expenditure, average R&D investment per SME declined from KRW 430 million in 2012 to KRW 200 million in 2023, while the average number of R&D personnel per firm fell from 5.7 to 3.6 over the same period (Figure 2.16). In addition, SMEs' technology development success rates and commercialization success rates have trended downward since the mid-2010s (Figure 2.17). The "innovation rate"—defined as the share of firms implementing product or managerial innovation over the past three years—stood at only 37% for SMEs in manufacturing in 2024, compared to approximately 58% for large and mid-sized firms, indicating a substantial gap (Figure 2.18).

Declining R&D investment and personnel per firm

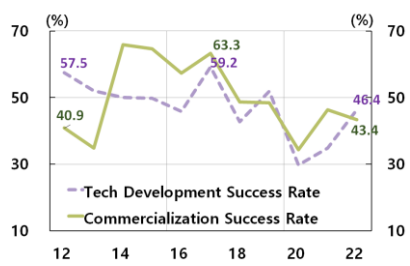
[Figure 2.16] R&D Investment and Personnel per Firm



Source: Survey of Technology of SMEs

Falling technology development and commercialization success rates

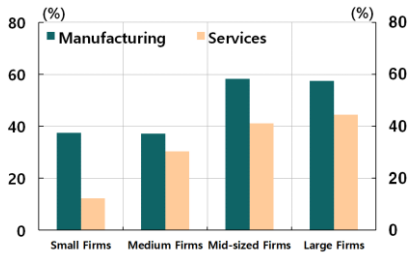
[Figure 2.17] Technology Development and Commercialization Success Rates



Source: Survey of Technology of SMEs

Lower innovation rates than large and mid-sized firms

[Figure 2.18] Innovation Rates by Firm Size [1)]



Note: 1) Share of firms implementing product or managerial innovation over the past three years

Source: Korean Innovation Survey (2023, 2024)

17. In summary, while Korea's SME sector accounts for a substantial share of employment and production and has expanded R&D investment in quantitative terms, it continues to face clear limitations in productivity, scale-up (the transition from SMEs to mid-sized firms), and economic dynamism. In particular, stagnant productivity, a rising share of zombie firms, declining entry and exit rates, and weak innovation outcomes suggest that the SME sector has yet to function as a true "core pillar" supporting the economy's overall growth potential. Based on this assessment, the next chapter empirically examines how policies aimed at supporting SMEs have affected the sector's performance and structural constraints.

3. Overview and Effects of the SME Support Policies

18. As discussed in Chapter 2, despite their substantial quantitative presence, Korean SMEs exhibit clear limitations in terms of productivity, scale-up, and economic dynamism. This chapter first reviews the evolution and current status of SME support policies in Korea, and then empirically evaluates how these policies have affected the performance of the SME sector as well as its structural limitations.

SME Policies Have Expanded Quantitatively and Are Significant in Scale

19. Korea's SME policy framework initially emerged as a complement to industrialization led by large firms and has gradually evolved toward promoting growth and innovation, particularly since the Asian Financial Crisis (Table 3.1). During the early industrialization period of the 1960s–1980s, policy efforts focused on strengthening the SME base as cooperative partners supporting large-firm-led growth strategies, through measures such as the enactment of the Framework Act on Small and Medium Enterprises (1966), financial support, and the development of industrial complexes. In the 1990s, as the limitations of a large-firm-centered growth model became increasingly apparent, enhancing the autonomous growth capacity of SMEs emerged as a key policy priority. In particular, following the 1997 financial crisis, the government intensified growth- and innovation-oriented policies, including the promotion of venture firms, support for entrepreneurship, and technological innovation. The legal and institutional foundation was strengthened through the enactment of the Act on Special Measures for the Promotion of Venture Businesses (1997) and the Act on the Promotion of Technology Innovation of SMEs (2001). Since the 2010s, the role of SMEs within the national innovation system has been increasingly emphasized, as the innovation base has been strengthened through measures such as the establishment of the Ministry of SMEs and Startups (2017) and the implementation of the Venture Investment Promotion Act (2020).

SME policies have evolved from supporting large firms toward a growth- and innovation-oriented framework.

[Table 3.1] Evolution of SME Policies in Korea

Period	Theme	Policy Orientation	Key Laws and Institutions
1960 - 80s	Industrialization	Supporting large-firm-led industrialization; expansion of industrial infrastructure through technology guidance and industrial complexes	Industrial Bank of Korea Act (1961) Framework Act on Small and Medium Enterprises(1966) Establishment of the Korea Small and Medium Business Corporation (1979)
1997 – 2010s	Strengthening self-sustaining growth and institutional foundations	Transition from large-firm-led growth; fostering venture and innovative firms	Act on Special Measures for the Promotion of Venture Businesses (1997) Introduction of KOSBIR program (1998) Small and Medium Enterprises Promotion Act (2000) Act on the Promotion and Technology Innovation of SMEs (2001)
Since the 2010s	Qualitative growth and advanced innovation	Establishing an innovation-driven growth paradigm; upgrading the national innovation system through public–private cooperation; integrating support programs	Introduction of TIPS (2013) Establishment of the SME Integrated Management System (SIMS) (2015) Launch of the Ministry of SMEs and Startups (2017) Launch of the Policy Finance Council for Innovative Growth (2019) Venture Investment Promotion Act (2020)

Source: Reconstructed from Kim et al. (2021) and related studies

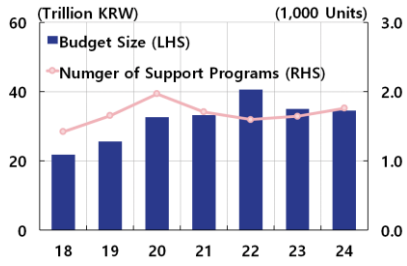
20. As a result of these policy efforts, government support for SMEs—particularly through policy finance—has expanded steadily. As of 2024, the total budget for SME-related programs implemented by the central and local governments amounts to approximately KRW 34.5 trillion, spanning 1,761 individual support programs (Figure 3.1). Support instruments include financial assistance (loans and guarantees), management support (business consulting, legal and accounting services), technology support (R&D and technology transfer), workforce support (training and human capital development), and export support (overseas expansion and marketing). Among these, financial support accounts for more than half of total expenditures[11] and has served as the core policy instrument, with both scale and scope expanding continuously since the 1997 financial crisis. As of 2024, policy loans administered by the Ministry of SMEs and Startups and credit guarantee volumes have grown 5.4-fold and 7.8-fold, respectively, compared to 1997 (Figures 3.2–3.3). Policy finance is provided not only through fiscal spending, but also via credit guarantees from the Korea Credit Guarantee Fund (KODIT) and the Korea Technology Finance Corporation (KIBO), the Bank of Korea's Bank Intermediated Lending Support

[11] Based on the 2024 budget, the breakdown is as follows: financial support (51.6%), technology support (20.7%), management support (10.6%), workforce support (9.7%), and export support (3.9%) (Paik et al., 2024).

Facility, and loan programs operated by policy financial institutions such as the Industrial Bank of Korea (IBK) and the Korea Development Bank (KDB). On the direct financing side, government-sponsored funds—such as the Korea Fund of Funds and the Growth Ladder Fund—have been established to expand investment in start-up firms and to crowd in private venture capital. In addition to direct fiscal programs, tax incentives—including income and corporate tax reductions and tax credits—are provided under the Restriction of Special Taxation Act to firms meeting industry-, size-, and region-specific criteria[12].

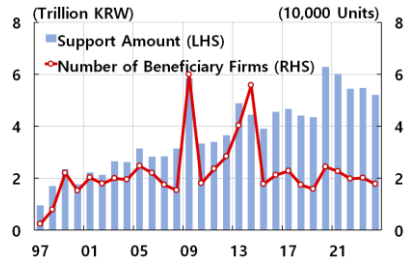
The scale of SME support policies has continued to expand.

[Figure 3.1] Budget and Number of Government SME Support Programs



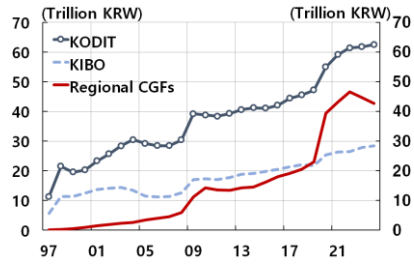
Source: Ministry of SMEs and Startups

[Figure 3.2] Policy Loans[1)]



Note: 1) Annual supply of programs under the Ministry of SMEs and Startups (excluding microenterprise policy loans since 2015)
Source: Ministry of SMEs and Startups

[Figure 3.3] Credit Guarantees[1)]

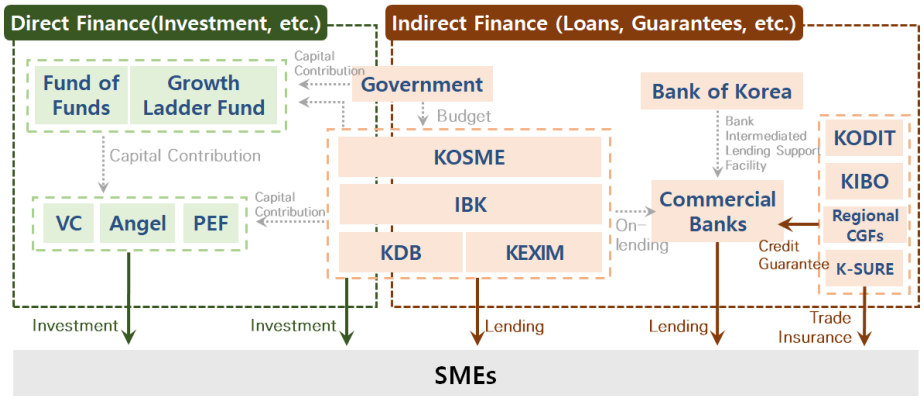


Note: 1) Outstanding balance
Source: Korea Credit Guarantee Fund; Korea Technology Finance Corporation; Korea Federation of Credit Guarantee Foundations

[12] The government offers various tax benefits, including tax reductions for start-ups, tax credits for research and human resources development expenses, deductions for social insurance premiums, and income tax reductions for employees in SMEs.

Financial support for SMEs is provided through various channels.

[Figure 3.4] SME Financial Support in Korea



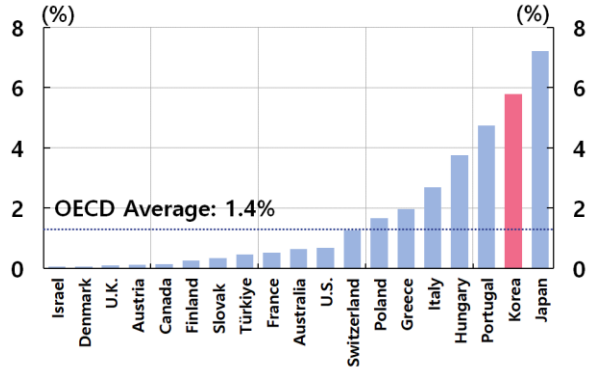
Source: Reconstructed from National Assembly Budget Office (2022)

21. Even compared with major OECD countries, Korea's scale of SME support and the degree of policy intervention are relatively high by international standards. As of 2022, the ratio of policy finance (government-guaranteed loans) to GDP in Korea stood at 5.8%, far exceeding the OECD average of 1.4% (Figure 3.5). While major advanced economies such as the United States and the United Kingdom increasingly emphasize leveraging private investment in supporting SMEs, Korea relies heavily on a government-led support structure centered on direct and indirect lending by policy financial institutions[13]. Under this structure, SMEs account for over 80% of total non-financial corporate lending by domestic financial institutions—the highest share among OECD member countries (Figure 3.6).

[13] Japan, which has a similar system to Korea, also maintains a high proportion of policy finance. Japan's ratio of government-guaranteed loans to GDP was lower than Korea's until 2019 but has surpassed Korea's since the onset of the COVID-19 pandemic (Source: OECD Financing SMEs and Entrepreneurs: An OECD Scoreboard).

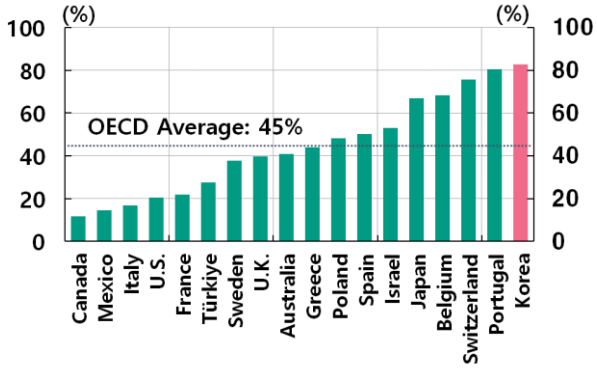
Korea's SME support scale exceeds the OECD average.

[Figure 3.5] Government-Guaranteed Loans as a Share of GDP[1)]



Note: 1) As of 2022; for Korea, includes combined guarantees from KODIT, KIBO, and regional credit guarantee foundations
Source: OECD; Ministry of SMEs and Startups

[Figure 3.6] SME Share of Corporate Lending by Financial Institution[1)]



Note: 1) As of 2022
Source: OECD

[Empirical Analysis] SME support policies have had a positive impact on sales and employment; however, their effects on improving productivity and profitability have been limited, while inducing side effects such as the expansion of zombie firms, threshold effects, and the crowding out of private finance.

22. While Korea's SME support policies have evolved toward fostering growth and innovation, reaching a substantial scale of implementation, it remains necessary to closely examine whether these measures have yielded their intended effects. As discussed in Chapter 2, Korea's SME sector continues to exhibit clear limitations in terms of productivity, growth from small to medium-sized enterprises, and entry and exit dynamics. Given these circumstances, it is necessary to empirically analyze the extent to which support policies to date have achieved the intended impacts on growth and innovation.

- The firms covered in the analysis are limited to SMEs excluding micro-enterprises. This is because microenterprises differ substantially from other SMEs in terms of their sales, employment, and profitability structures, and policy objectives for microenterprises are relatively more focused on livelihood protection and local economic stability.
- The analysis utilizes the Statistical Business Registers (SBR)[14], which provide census-based information on all enterprises and establishments including details on government support. Financial information other than sales was

[14] Detailed information regarding the Statistical Business Registers (SBR) and government support categories is described in BOX 4.

obtained by linking SBR enterprise codes with the NICE financial statement database, and enterprise-level financing data by financial institution were sourced from Korea Rating & Data (KoDATA).

▸ [Analysis ①] Expansion of Sales and Employment, and a Reduction in the Probability of Exit

23. SME support policies exhibited effects of expanding sales and employment and reducing exit probabilities (Figures 3.7–3.9). When the amount of government support received in the previous year rises by 1%, sales exhibit a persistent positive effect from year 1 through year 3. Employment also increases, with the effect remaining evident through year 2 after support is provided. Converting the coefficients into monetary amounts and headcounts, an increase in government support of KRW 100 million per firm is estimated to raise average annual sales by about KRW 8.2 million and employment by 0.012 persons[15]. This result is consistent with the findings of Bin and Park (2017), who show that government support promotes firms' expansion in scale. Meanwhile, an increase in support of the same magnitude lowers the average annual probability of exit by about 0.017 percentage points, suggesting that government support also serves a protective function by delaying firm exit.

Regression Model for Analyzing Effects on Sales and Employment

To examine the effects of SME support on firms' sales and employment, we estimated the following fixed-effects model.

$$Y_{i,t+h} = \alpha + \beta \log(Policy_{i,t-1}) + \gamma X_{i,t-2} + \mu_i + \delta_t + \epsilon_{i,t}$$

Where $Y_{i,t+h}$ denotes the dependent variables, representing firm i's log(Sales), log(Number of Employees), ROA, capital productivity(Value-added/Operating Capital), log(Facility Investment) at $t+h$. μ_i and δ_t represent firm fixed effects and year fixed effects, respectively. $\log(Policy_{i,t-1})$ is the log-transformed total amount of SME support received in the previous year. $X_{i,t-2}$ denotes control variables, which include firm size(log(Total Assets)), firm age, debt ratio (leverage), export status, Interest Coverage Ratio (ICR), and value-added ratio.

Regression Model for Analyzing Effects on Exit Probability

To analyze the impact of SME support on firm exit, the following logit model was estimated:

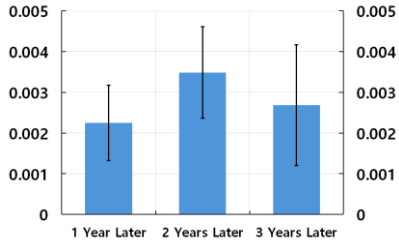
$$Pr(Fail_{i,t+h} = 1) = F(\alpha + \beta_f \, log(Policy_{i,t-1}) + \gamma X_{i,t-2} + \nu_s + \delta_t + \epsilon_{i,t})$$

Where $Fail_{i,t+h}$ denotes the exit status of firm i at time $t+h$ (1 = exit, 0 = survival). ν_s and δ_t represent industry fixed effects and year fixed effects, respectively. $X_{i,t-2}$ denotes control variables, which include log(Sales), log(Number of Employees), firm age, gender of the representative, administrative area code of residence, age of the representative, and export status.

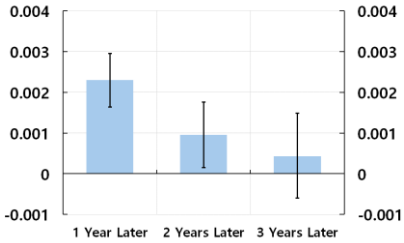
[15] The average annual effect was calculated using only statistically significant estimates from years 1 to 3, and the same criterion was applied in the subsequent analysis.

SME support increases sales and employment and reduces the probability of exit.

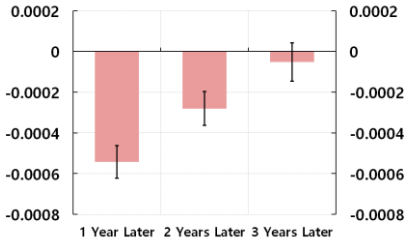
[Figure 3.7] Effect of SME Support on Sales[1)]



[Figure 3.8] Effect of SME Support on Employment[1)]



[Figure 3.9] Effect of SME Support on the Probability of Exit[2)]

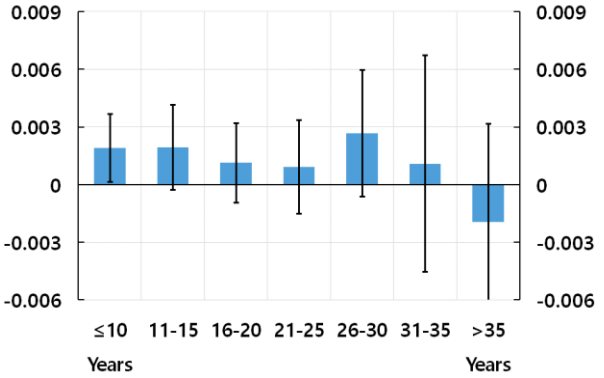


Notes: 1) Bars represent point estimates(β) over time; vertical lines indicate 95% confidence intervals.
2) Bars represent average marginal effect (AME) estimates over time; vertical lines indicate 95% confidence intervals.
Source: Author's estimates

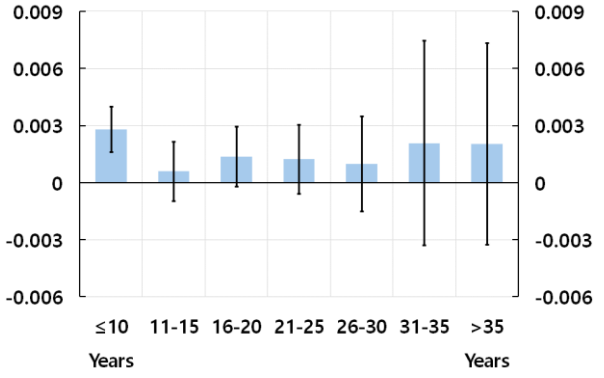
24. These expansionary effects on sales and employment were more pronounced among young and newly established firms. When government support increased by 1%, firms with 10 years or less of operation saw a significant increase in sales and employment in the following year; however, no statistically significant effect was observed for older firms (Figures 3.10 and 3.11). This is consistent with the findings of Gu et al. (2022), who reported that the impact of support policies is greater for younger firms and suggests the possibility that policy effects are more effectively manifested in startups characterized by relatively higher levels of innovation and productivity (Acemoglu et al., 2018; Midrigan & Xu, 2014).

The impact of SME support is relatively more pronounced in younger firms.

[Figure 3.10] Effect of SME Support on Sales by Firm Age[1),2)]



[Figure 3.11] Effect of SME Support on Employment by Firm Age[1),2)]

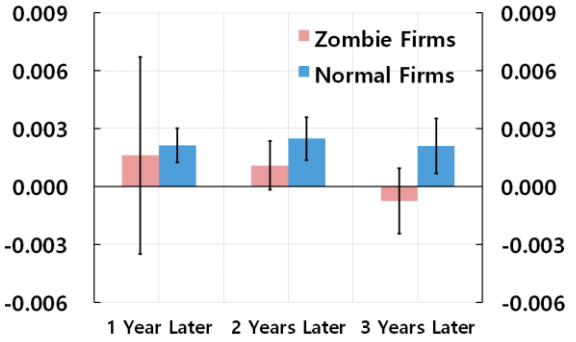


Notes: 1) Bars represent the estimated effects one year after the support for each firm-age group
2) The horizontal axis represents firm age, and the vertical lines indicate the 95 % confidence intervals.
Source: Author's estimates

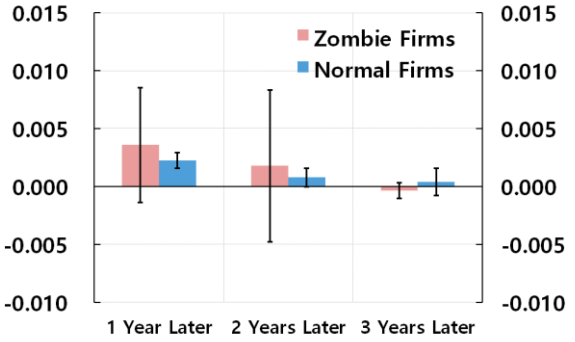
25. Meanwhile, the expansionary effects of government support on sales and employment were observed only among non-zombie firms. Figure 3.12 and Figure 3.13 present the results of applying the same regression model separately after dividing the sample into zombie firms and normal firms. In the case of zombie firms, the effects on sales and employment were not statistically significant; thus, unlike normal firms, no significant effects of government support were identified. This aligns with concerns that support for zombie firms may result in merely prolonging their survival rather than facilitating performance improvements.

The performance-improving effects of support for zombie SMEs are not clear.

[Figure 3.12] Effect on Sales by Zombie Status[1),2)]



[Figure 3.13] Effect on Employment by Zombie Status[1),2)]



Notes: 1) Zombie firms are defined as those with an interest coverage ratio (ICR) of less than 1 for three consecutive years
2) Bars represent the estimated coefficients, and the vertical lines indicate the 95 % confidence intervals.
Source: Author's estimates

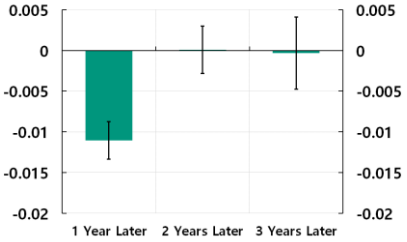
▸ [Analysis ②] Limited Effects on Improving Productivity, Profitability, and Investment

26. SME support did not lead to improvements in productivity, profitability, or investment. The results of estimating the impact of the previous year's government support on capital productivity (value-added relative to operating asset), ROA (net income relative to total assets), and facility investment using the same regression model are presented in Figures 3.14 to 3.16. When government support increased by 1%, capital productivity and ROA exhibited statistically significant negative effects only in the first year following the support, with no significance observed in the second and third years. In monetary terms, an increase of 100 million KRW in government support per firm is estimated to reduce capital productivity by approximately 0.31% and ROA by 0.038%p. Facility investment also significantly decreased in the first and second

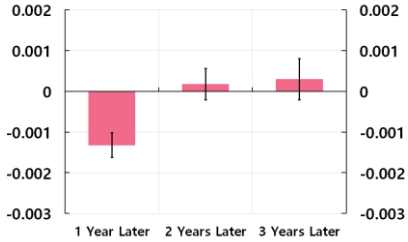
years after support, falling by an annual average of approximately 3.32 million KRW per 100 million KRW of government support. This implies that while policy support contributes to short-term quantitative expansion, such as in sales and employment, it does not sufficiently translate into the strengthening of long-term growth foundations[16], including improvements in productivity and profitability and increases in investment (Jang, 2016; Bin and Park, 2017).

The effects of government support on productivity, profitability, and investment are either negative or insignificant.

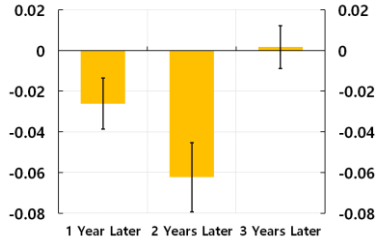
[Figure 3.14] Impact of SME Support on Productivity[1)]



[Figure 3.15] Impact of SME Support on ROA[1)]



[Figure 3.16] Impact of SME Support on Facility Investment[1)]



Notes: 1) Bars represent point estimates(β) over time; vertical lines indicate 95% confidence intervals.
Source: Author's estimates

▸ [Analysis ③] Negative Externalities of Support for Zombie Firms

27. The results indicate that the expansion of SME support increases the probability of firms becoming zombie firms, potentially leading to resource misallocation and negative externalities. According to Figure 3.17, an increase of 100 million KRW in support is associated with an average annual increase of 0.026%p in the probability of a firm becoming a zombie firm in the following year. This aligns with previous literature (Chung, 2014; Song et al., 2021) suggesting that SME support may lead to an increase in zombie firms and a delay in market exits. Furthermore, it is estimated that a 1%p increase in the share of zombie firms within an industry results in a 0.23% decrease in facility investment and a 0.19%p decrease in ROA for normal firms (Figure 3.18). This implies that an

[16] Productivity enhancement increases the efficiency of resource utilization, and improved profitability leads to the securing of funds necessary for future growth, such as R&D. An expansion of capital investment raises the level of technology and equipment, thereby leading to improvements in productivity. Such improvements in productivity, profitability, and investment strengthen the long-term growth potential of SMEs and contribute to enhancing the economy's growth potential. This has been the direction pursued by Korea's SME policies since the 2000s.

expanding share of zombie firms entails negative externalities that undermine the performance of normal firms.

Regression Model for Analyzing the Effects of Support for Zombie Firms

The impact of government support on the probability of firms becoming zombie firms was analyzed using the following logit model:

$$Pr(Zombie_{i,t+h} = 1) = F(\alpha + \beta_z \, log(Policy_{i,t-1}) + \gamma X_{i,t-2} + \nu_s + \delta_t + \epsilon_{i,t})$$

Where $Zombie_{i,t+h}$ denotes the zombie status of firm i at time $t+h$ (1 = zombie firm, 0 = normal firm). ν_s and δ_t represent industry fixed effects and year fixed effects, respectively. Control variables $X_{i,t-2}$ include firm size (log(Total Assets)), firm age, debt ratio, export status, interest coverage ratio (ICR), and value-added ratio.

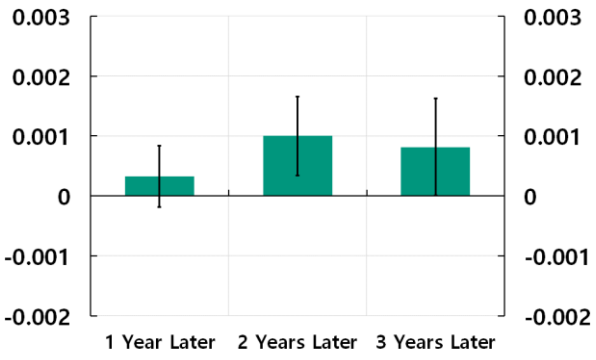
Next, to examine the impact of zombie firms on resource allocation, a regression analysis was conducted following the methodology of Caballero et al. (2008). In this model, facility investment and ROA of normal firms are used as dependent variables, and the share of zombie firms within the industry is employed as the key explanatory variable:

$$Outcome_{i,t} = \alpha + \beta_1 \, D(Normal_{i,t}) + \beta_2 D(Normal_{i,t}) \times ZombieShare_{i,t} + \gamma X_{i,t} + \delta_{s,t} + \epsilon_{i,t}$$

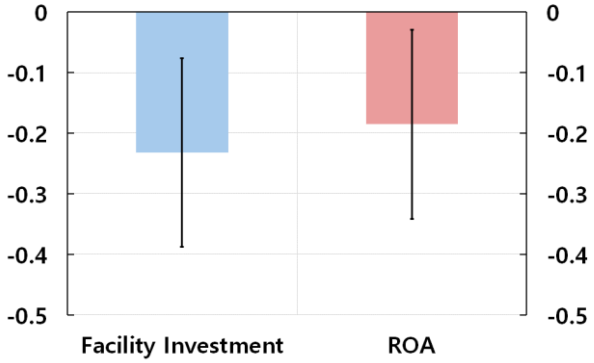
Where $Outcome_{i,t}$ represents log of Facility Investment and ROA of firm i. The independent variable $D(Normal_{i,t})$ is a dummy variable that takes the value of 1 if firm i is a normal firm at time t, and 0 otherwise. , $ZombieShare_{i,t}$ denotes the share of zombie firms in industry s at time t. Control variables $X_{i,t}$ include firm size (log(Total Assets)), firm age, debt ratio, export status, ICR, and value-added ratio. $\delta_{s,t}$ represents industry-year fixed effects, which control for potential variations in industry environments and characteristics over time. A negative value for β_2 signifies that zombie firms exert negative externalities on normal firms.

SME support increases the probability of firms becoming zombie firms and exerts negative externalities on normal firms.

[Figure 3.17] Effect of SME Support on the Probability of Becoming a Zombie Firm[1),2)]



[Figure 3.18] Externalities of the Share of Zombie Firms: Effect on the Performance of Normal Firms[1),3)]



Notes: 1) Zombie firms are defined as those with an interest coverage ratio (ICR) of less than 1 for three consecutive years
2) Bars represent average marginal effect (AME) estimates at each point in time; vertical lines indicate 95% confidence intervals
3) Coefficient estimates of the interaction term (share of zombie firms × normal-firm dummy), representing the external effects of the share of zombie firms on the performance of normal firms.

Source: Author's estimates.

▸ [Analysis ④] Emergence of Threshold Effects near the the SME Support Eligibility Boundary

28. Among SMEs, those closer to the mid-sized enterprises eligibility threshold exhibited a relatively smaller sales-boosting effect from support policies. In the regression model below, the coefficient on the interaction term between government support and firm size (β_3) is statistically significant and negative for the full SME sample (Figure 3.19). This implies that, among recipient firms, the sales growth effect of SME support weakens as firm size increases and approaches the eligibility cutoff. This pattern is particularly pronounced for SMEs whose "distance to the cutoff" (actual firm sales / the government's support eligibility sales threshold) is close to 1—i.e., firms located near the eligibility threshold (distance-to-cutoff range of 0.85–1). By contrast, for very small firms far from the cutoff and for firms that have already moved beyond the SME category, this interaction effect is not statistically significant.

Regression Model for Analyzing Threshold Effects ①

Following the methodology of Choi et al. (2024), the following regression model was established:

$$Growth_{i,t} = \alpha + \beta_1 Size_{i,t-1} + \beta_2 Policy_{i,t-1} + \beta_3 (Size_{i,t-1} \times Policy_{i,t-1}) + \gamma X_{i,t-2} + \mu_i + \delta_t + \epsilon_{i,t}$$

where $Growth_{i,t}$ represents the sales growth rate of firm i between periods $t-1$ and t, $Size_{i,t-1}$ denotes firm size (log-transformed sales), and $Policy_{i,t-1}$ is the log-transformed amount of government support in the previous period. μ_i and δ_t represent firm fixed effects and year fixed effects, respectively. The coefficient of interest, β_3, measures the interaction effect between firm size and government support. Control variables $X_{i,t-2}$ include firm size (log(Total Assets)), firm age, debt ratio, export status, interest coverage ratio (ICR), and value-added ratio. The core of this analysis is to identify how sales growth changes as SMEs approach the eligibility threshold for government support. To this end, a 'distance to the cutoff' (actual sales divided by the threshold sales for government support) was utilized. A value closer to 1 indicates that the firm is nearing the eligibility boundary for government support.

29. Furthermore, SMEs that received support showed a trend of decelerating sales growth immediately after transitioning into mid-sized enterprises. According to Figure 3.20, SMEs with a history of government support are estimated to experience a statistically significant reduction of about 3.5 percentage points in sales growth after transitioning into mid-sized enterprises, compared with the period prior to the transition. Meanwhile, no statistically significant change was observed in the employment growth rate. This can be interpreted as being due to the fact that SME support criteria are directly linked to sales (see BOX 2), making it highly likely that firms adjust their behavior primarily around sales.

Regression Model for Analyzing Threshold Effects ②

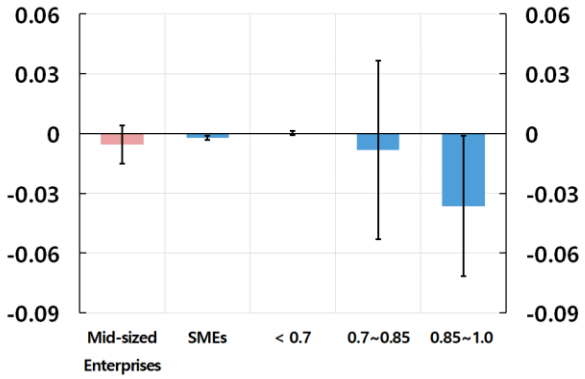
Using SBR data, we compared the sales growth rates before and after the transition from SME to mid-sized enterprise for firms that actually received government support during the sample period.

$$Y_{i,t} = \alpha + \beta\, post_grad_{i,t} + \gamma X_{i,t-1} + \mu_i + \delta_t + \epsilon_{i,t}$$

where $Y_{i,t}$ represents the growth rate of sales or employment of firm i at time t, and μ_i and δ_t denote firm fixed effects and time fixed effects, respectively. $post_grad_{i,t}$ is a dummy variable indicating whether the firm has transitioned from an SME to a mid-sized enterprise, taking a value of 0 before the transition and 1 thereafter. $X_{i,t-1}$ is a vector of control variables including firm size (log(Total Assets)), firm age, debt ratio, export status, interest coverage ratio (ICR), and value-added ratio. In this model, β is the key coefficient that measures how growth rates, such as sales growth, change after the transition from SME to middle-standing enterprise status.

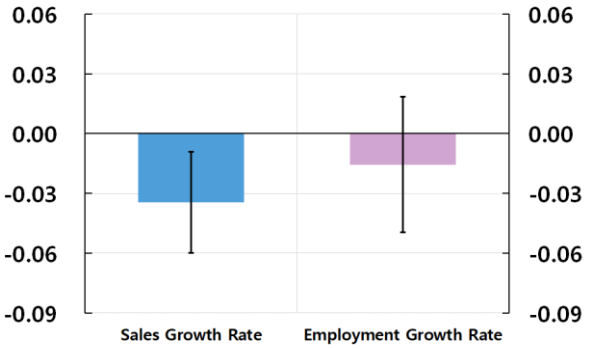
Slower Sales Growth near the Support Eligibility Threshold

[Figure 3.19] Effect of Government Support on Sales Growth Rate by Firm Size[1),2),3)]



Note: 1) Bars indicate the estimated coefficient on the interaction term "firm size × government support."
2) Vertical lines denote 95% confidence intervals.
3) Distance from the cutoff = firm sales ÷ the government support eligibility threshold; values closer to 1 indicate greater proximity to the cutoff
Source: Authors' estimates.

[Figure 3.20] Changes in Sales and Employment Growth Rates after Transitioning to Mid-sized Enterprise Status[1),2)]



Note: 1) Bars indicate the estimated coefficient on $post_grad$
2) Vertical lines denote 95% confidence intervals.
Source: Authors' estimates.

30. While this "threshold effect" itself merely documents the statistical pattern of lower growth rates near the eligibility cutoff, it may also partly reflect growth-avoidance behavior akin to a "Peter Pan syndrome". This is because firms nearing the threshold can face incentives to avoid growth, as crossing the boundary results in the loss of various benefits while concurrently leading to increased regulatory burdens.

▸ [Analysis ⑤] Crowding-out Effects on Private Finance

31. Meanwhile, the expansion of SMEs' utilization of policy finance[17] was found to crowd out capital raising through private finance. According to the logit model analysis, a 1% increase in the scale of policy finance led to a statistically significant decrease of approximately 0.11%p in the probability of a firm utilizing private finance over the following three years (Figure 3.21). Furthermore, a firm fixed-effect panel regression analysis (Figure 3.22) also revealed that policy finance has a significant negative impact on the volume of private borrowing, confirming the existence of a crowding-out effect. This implies that policy finance may induce even those firms capable of independent market-based financing to rely on policy funds[18], or potentially hinder the long-term development of private finance.

Regression Model for Analyzing the Crowding-out Effect of Policy Finance on Private Finance

To examine the effects of the use of policy finance on private financing, we estimated the following two models using the NICE–KoDATA firm-level panel dataset. First, a logit model was used to verify the probabilistic impact of policy finance on whether a firm utilizes private finance.

$$Pr\left(Private_{i,t+h}=1\right)=F\left(\alpha+\beta_1\,log\left(Policy_{i,t-1}\right)+\gamma X_{i,t-2}+\nu_s+\delta_t+\epsilon_{i,t}\right)$$

Here, $Private_{\mathrm{i,t+h}}$ represents whether firm i utilized private finance at period $t+h$ (1 = utilized, 0 = not utilized), ν_s denotes industry fixed effects, and δ_t denotes year fixed effects. $X_{i,t-2}$ includes control variables such as firm size (log(Total Assets)), interest coverage ratio, debt ratio, and value-added ratio.

Second, the impact of policy finance on private finance was analyzed through a panel fixed-effect regression model.

$$log\left(Private_{i,t+h}\right)=\alpha+\beta_2\,log\left(Policy_{i,t-1}\right)+\gamma X_{i,t-2}+\mu_i+\delta_t+\epsilon_{i,t}$$

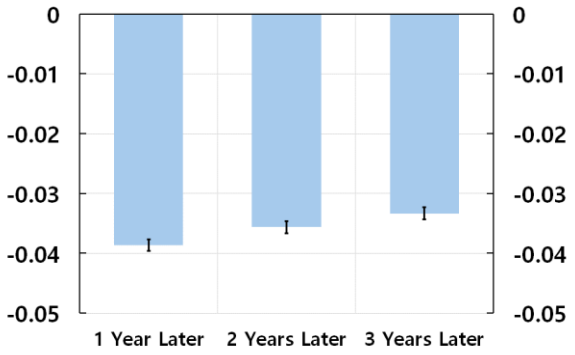
where $\log\left(Private_{i,t+h}\right)$ represents the log-transformed amount of private finance for firm i at period $t+h$, μ_i denotes firm fixed effects, and δ_t denotes year fixed effects. $\log\left(Policy_{i,t-1}\right)$ is the log-transformed amount of policy finance from the previous period, and $X_{i,t-2}$ includes control variables such as firm size (log-transformed total assets), interest coverage ratio, debt ratio, and value-added ratio.

[17] Policy finance is defined as financing provided through public institutions, including the Korea Development Bank (KDB), the Export–Import Bank of Korea (KEXIM), the Industrial Bank of Korea (IBK), the Korea Credit Guarantee Fund (KODIT), the Korea Technology Finance Corporation (KIBO), the Korea SMEs and Startups Agency (KOSME), and the Korea Federation of SMEs (KBIZ). Private finance, in contrast, is defined as financing obtained from private financial institutions, including nationwide commercial banks—such as KB Kookmin Bank, Shinhan Bank, Woori Bank, Hana Bank, Standard Chartered Bank Korea, and Citibank Korea—as well as regional banks—such as BNK Kyongnam Bank, Kwangju Bank, iM Bank, BNK Busan Bank, Jeonbuk Bank, and Jeju Bank—and other private financial institutions, including NongHyup Bank and Suhyup Bank.

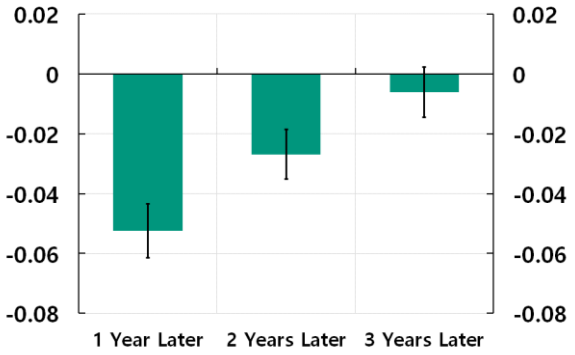
[18] There is also a possibility of reverse causality, where support through policy finance expands when procuring private finance becomes difficult due to the external environment. This study controlled for such effects by employing lagged variables for the policy finance variable.

Policy finance reduces both the probability and the volume of private finance utilization.

[Figure 3.21] Effect of Using Policy Finance on the Probability of Using Private Finance[1)]



[Figure 3.22] Effect of Using Policy Finance on the Amount of Private Finance Used[2)]



Note: 1) Bars indicate the estimated average marginal effects by horizon, and vertical lines denote 95% confidence intervals.
2) Bars indicate the estimated coefficient β_2 by horizon, and vertical lines denote 95% confidence intervals.
Source: Authors' estimates.

32. In summary, South Korea's SME support policies exhibit two-sided effects, characterized by quantitative and short-term achievements alongside qualitative and long-term limitations. The policies appear to have yielded clear positive outcomes in terms of quantitative growth and short-term survival stability, as evidenced by expanded sales and employment and a reduced probability of closure. However, taking into account the impacts on productivity, profitability, investment, entry and exit dynamics, zombie firms, and private finance, it is difficult to rule out the possibility that the current support regime may have entrenched or even reinforced the structural weaknesses of the SME sector identified in Chapter 2, rather than fundamentally addressing them. In particular, the limited effectiveness of policies in areas crucial for medium- to long-term growth, such as productivity and facility investment, suggests that the policy objective of strengthening the growth and innovation capacities of SMEs has not been sufficiently realized. Chapter 4 will examine the institutional designs, operations, and incentive structures that give rise to these results.

BOX 1 Prior Studies on the Effects of SME Support Policies and How This Study Differs

Prior studies suggest that Korea's SME support policies may have delivered some positive effects on observable outcomes such as sales and employment, while potentially falling short of translating these gains into substantive improvements in productivity and profitability. Jang(2016) reports that the estimated effects of policy finance on firms; value added and productivity are not statistically significant, and Nam(2014) finds that once the credit guarantee ratio exceeds a certain threshold, productivity and profitability may actually decline. Bin and Park(2017) likewise show that policy finance is positively associated with firms' quantitative growth indicators (e.g., sales and employment), whereas its effects on profitability improvements appear limited. In addition, some studies caution that government financial support could be associated with an increase in financially distressed firms (zombie firms) and delays in market exit. Jung(2014) argues that post-crisis forbearance toward distressed firms may postpone restructuring and adversely affect employment and investment by healthy firms. Song et al.(2021) document that a substantial share of long-term zombie firms receive government funds, suggesting that policy finance may act as a factor delaying market exit.

By contrast, research focusing on innovative firms and early-stage startups tends to find relatively clearer policy effects. Yang(2018) reports that beneficiaries of government startup support programs experienced larger increases in sales and employment than non-beneficiaries. Gu et al.(2022) also find that recipients of innovation finance exhibit statistically significant increases in sales, value added, and employment, with larger effects among younger firms.

This study—comprising the empirical analysis in Chapter 3 and the structural model in Chapter 5—distinguishes itself from the existing literature in the following respects. (1) It derives policy implications through a comprehensive comparison of the effects of existing policies and alternative institutional arrangements. (2) It links multiple micro-level datasets (Statistical Business Registers, NICE, and KoData, among others) to evaluate firm performance across multiple dimensions, including sales, employment, and productivity. (3) It employs a structural general equilibrium framework to assess not only firm-level outcomes but also economy-wide spillover effects in an integrated manner.

[Table 1] Selected Prior Studies on the Effects of Korea's SME Support Policies

Study	Methodology	Main findings
Jang(2016)	Compares outcomes of beneficiary vs. non-beneficiary firms using propensity score matching (PSM)	Policy finance shows limited effects on value added and productivity, but contributes to higher survival rates
Nam(2014)	Regression analysis of the relationship between credit guarantee ratios and performance indicators	Marginal effects are larger at lower guarantee ratios; higher guarantee ratios may reduce productivity and profitability
Gu et al.(2015)	Estimates SME funding demand and supply functions and conducts regression analysis	Policy finance is generally effective in easing financing constraints, though effectiveness differs across policy instruments
Bin and Park(2017)	Difference-in-differences (DID) analysis using SIMS data	Positive effects on sales and employment growth; limited effects on profitability improvements
Kim and Bae(2021)	Data envelopment analysis (DEA) to evaluate support efficiency	Efficiency of policy support for SME manufacturing has not improved
Yang(2018)	Compares performance between startup support beneficiaries and non-beneficiaries	Beneficiaries outperform general startups in employment, survival rates, and the share of high-growth firms
Noh(2022)	Survival model analysis using establishment panel data	Credit guarantees and venture certification significantly increase survival probabilities for firms aged five years or less
Gu et al.(2022)	PSM matching and DID analysis	Innovation finance recipients experience statistically significant increases in sales, value added, and employment, particularly among younger firms
Song et al.(2021)	Regression analysis of determinants of zombie firms and case studies	A substantial share of long-term zombie firms receive government funds, which may contribute to delayed market exit

Source: Author's compilation

4. Structural Issues in SME Support Policies

33. While Chapter 3 empirically examined what outcomes arise when support is provided, this chapter focuses on which aspects of the design and operation of the current system give rise to such effects and limitations. Specifically, it reviews the major components of the current SME support framework—namely support criteria, target selection methods, restructuring and exit systems, and policy delivery systems—and explores how these institutional design details are linked to the limitations and side effects identified in Chapters 2 and 3.

① Sales-centered, "Size-dependent" Policies and Broad-Based Support

34. Basically, South Korea's SME support system is size-dependent in nature. First, firms are categorized as SMEs based on average sales and total asset criteria[19] according to the Framework Act on Small and Medium Enterprises. Subsequently, individual government departments and policy agencies apply secondary, detailed criteria tailored to their specific project objectives. While these criteria offer advantages such as administrative clarity and ease of operation, they possess a significant limitation: if secondary screenings do not function properly, the selection of support targets is dictated by simple size requirements rather than a firm's qualitative capabilities or innovativeness. Given the reality where policy objectives vary by department and implementing agencies lack specialized expertise in firm evaluation and information access, the institutional foundation for assessing qualitative factors is insufficient, making it likely that the secondary screening function will underperform. As a result, government support may in practice be determined by sales size, leading to a situation in which policy support is concentrated on firms not because of high productivity or growth potential, but simply because they are small in size.

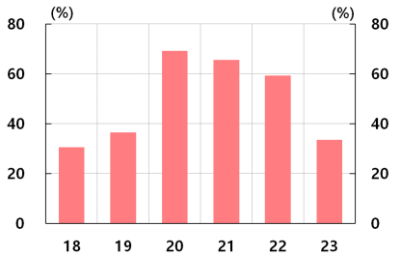
35. Looking at the actual support structure, there is a strong characteristic of "broad-based support," where funds are spread thin across a wide range of firms that meet the size criteria. According to SBR data, the average proportion of SMEs receiving policy support over the last six years was approximately 50%. This figure rose from the 30% range in 2018–2019 to around 70% during 2020–

[19] Under the current Framework Act on Small and Medium Enterprises, firms are classified as SMEs if their average sales over the last three years range from 40 billion to 180 billion KRW (for manufacturing, depending on the specific industry) and their total assets are below 500 billion KRW. These monetary criteria were introduced in 2015; prior to that, SME status was determined by the number of regular employees (see BOX 2).

2022 in response to COVID-19, before returning to the 30% level in 2023 (Figure 4.1). This implies that, depending on the year, between one-third and more than two-thirds of all SMEs experience policy support, indicating that the scope of beneficiaries is set very broadly. Meanwhile, the average support amount per firm generally decreased after 2018 but rebounded to 400 million KRW in 2023. Furthermore, the proportion of firms receiving less than 100 million KRW reached 78% in 2022 and approximately 60% in 2023, showing that a large number of firms still receive relatively small amounts of support (Figures 4.2–4.3). Synthesizing these two characteristics—a broad scope of beneficiaries combined with a relatively small support scale per firm—it can be concluded that SME support exhibits broad-based characteristics, being thinly distributed across a wide target group rather than being concentrated on firms with high growth potential.

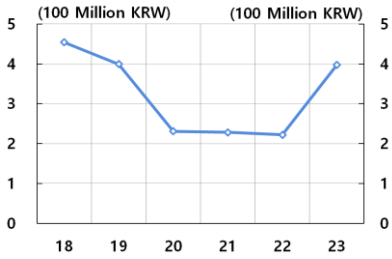
A tendency toward broad-based support for a large number of SMEs

[Figure 4.1] Proportion of SME Support Recipient Firms[1),2)]



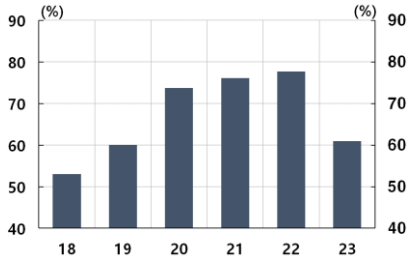
Note: 1) Share of SMEs receiving government support among all SMEs
2) Excluding micro-enterprises
Source: SBR (Statistical Business Registers)

[Figure 4.2] Average Support Amount per Firm[1)]



Note: 1) Excluding micro-enterprises
Source: SBR (Statistical Business Registers)

[Figure 4.3] Share of Firms Receiving Less than 100 Million KRW[1),2)]



Note: 1) Share of supported firms receiving less than KRW 100 million KRW
2) Excluding micro-enterprises
Source: SBR (Statistical Business Registers)

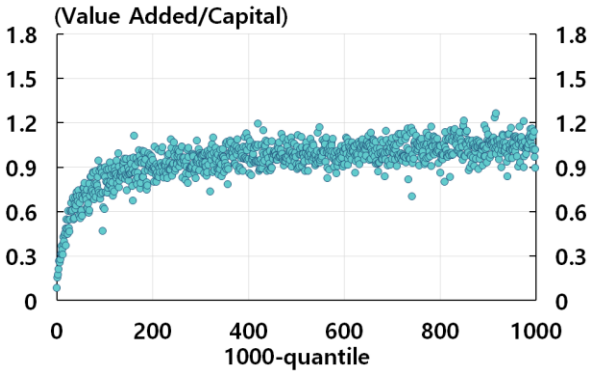
36. For a size-centered, broad-based support structure to be efficient, the scale of sales and the (marginal) productivity of capital would need to be closely related; in practice, however, this is not the case. If there were a strong correlation between these two indicators, SME support based on size-dependent policies could contribute significantly to enhancing individual firm productivity and improving overall economic efficiency. Government support for firms is ultimately a policy of reallocating resources from "non-target firms" to "target firms", and its effectiveness depends heavily on the difference in the distribution of marginal productivity between the two groups. If the marginal productivity of target firms is higher than that of non-target firms, government support improves economic

efficiency; otherwise, it can lead to resource misallocation. However, as shown in Figure 4.4, capital productivity by firm size decile appears flat across most intervals, showing no distinct difference based on firm size. This suggests that selecting support targets based solely on sales criteria may not be efficient in terms of productivity enhancement and resource allocation efficiency[20].

37. By contrast, firm age is one of the criteria considered in the second-stage screening, and—unlike sales—it is found to exhibit a clear correlation with capital productivity. As shown in Figure 4.5, younger firms tend to have higher capital productivity. The literature also notes that young firms are a key source of disruptive innovation, such as new product development, but face capital constraints at the entry stage, which is associated with higher capital productivity (Acemoglu et al., 2018; Midrigan & Xu, 2014). The fact that this pattern is also observed in Korean data suggests that appropriately identifying and supporting younger firms could contribute to improving allocative efficiency in the economy[21].

Capital productivity shows no significant correlation with firm size, whereas younger firms exhibit higher capital productivity.

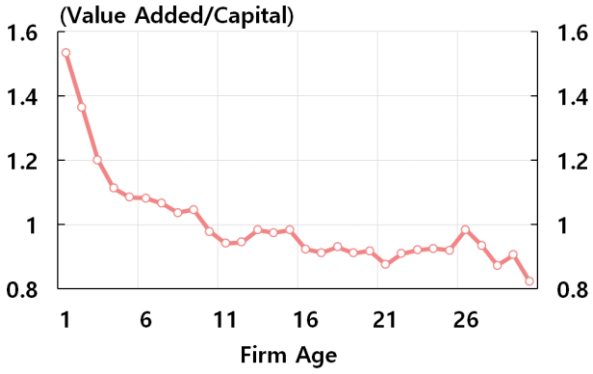
[Figure 4.4] Capital Productivity by Firm Size Decile[1)]



Notes: 1) After standardizing the operating asset of each firm (excluding micro-enterprises) by industry sub-class, the ratio of the total value-added to the total standardized operating asset was calculated for each value-added decile

Source: Linked SBR and NICE firm-level data

[Figure 4.5] Capital Productivity of SMEs by Firm Age[1)]



Notes: 1) After standardizing the operating asset of each firm (excluding micro-enterprises) by industry sub-class, the ratio of the total value-added to the total standardized operating asset was calculated by firm age

Source: Linked SBR and NICE firm-level data

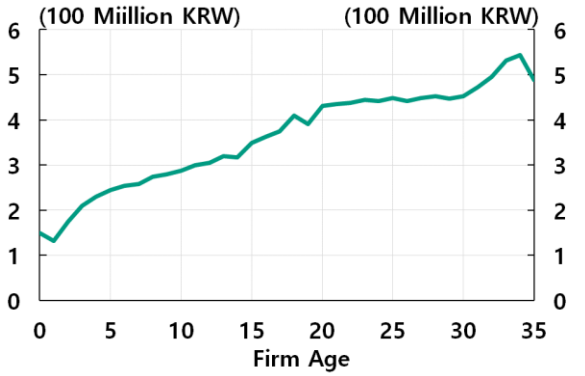
[20] Due to the difficulty of deriving marginal productivity from the data, average productivity was employed as a proxy variable. Under the assumption of diminishing marginal productivity, average productivity declines as marginal productivity falls; thus, this indicator can be interpreted as reflecting the underlying marginal productivity.

[21] Meanwhile, labor productivity does not show significant differences based on firm age, while both the value-added to total factor costs (labor costs + capital costs) and the sales-to-total cost ratio are higher among younger firms.

38. However, in practice, policy support does not sufficiently reflect the productivity differences across firm ages. Looking at the average government support amount by firm age from 2018 to 2023, startups with an age of five years or less receive an average of 100 to 200 million KRW, whereas firms with an age of 20 years or more receive over 400 million KRW (Figure 4.6). Furthermore, in terms of the beneficiary rate, startups with an age of five years or less remain at the 30–40% level, while older firms show a higher beneficiary rate of approximately 50% (Figure 4.7). This indicates that the SME support framework fails to differentiate between high-productivity early-stage firms and low-productivity mature firms. In other words, it suggests that firm age is not functioning effectively as a secondary screening criterion in the policy support process.

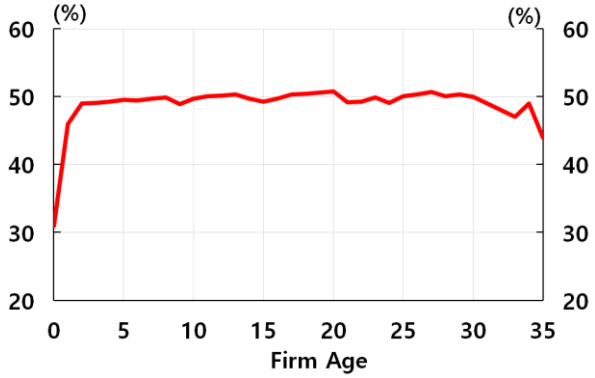
Government support appears to insufficiently reflect productivity differences across firm ages.

[Figure 4.6] Average Government Support Amount by Firm Age[1)]



Notes: 1) Average government support amount by firm age for firms (excluding micro-enterprises) from 2018 to 2023
Source: Statistical Business Register (SBR)

[Figure 4.7] Proportion of Government Support Recipients by Firm Age[1)]



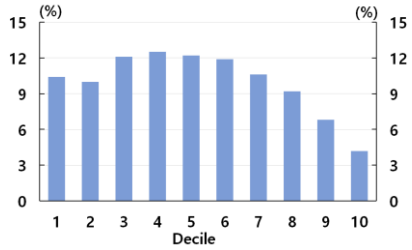
Notes: 1) The proportion of firms that received government support relative to the total number of firms (excluding micro-enterprises) in each age group from 2018 to 2023
Source: Statistical Business Register (SBR)

39. As a result of these institutional designs and support practices, SME support does not exhibit a strong positive relationship with productivity or growth performance; rather, the share of beneficiary firms tends to be higher among firms with lower productivity and growth potential. When SMEs are categorized into 10 deciles based on capital productivity, a pattern emerges where the share of government support recipients is higher in the lower productivity deciles and decreases as one moves toward the higher deciles (Figure 4.8). For example, while the support shares for the 1st to 3rd bottom deciles are at the 10–12% level, they fall for the 7th decile and above, with the support share for the 10th decile—

the firms with the highest productivity—amounting to only 4.2%. Analysis based on Return on Assets (ROA) also shows similar results; the support share for the 1st to 3rd bottom deciles is 11–12%, whereas for the 8th to 10th deciles, it is 9%, 8%, and 5%, respectively, indicating a tendency for the support share to decrease as profitability increases (Figure 4.9). In the analysis based on sales growth rates, the support share for the 1st to 3rd bottom deciles is over 11%, which is higher than the upper deciles that remain below 10%, and in particular, the support share for the highest 10th decile is a mere 5.9% (Figure 4.10). In summary, the proportion of government support recipients in the lower deciles (low-productivity, low-profitability, and low-growth firms) is consistently higher than that in the upper deciles (high-productivity, high-profitability, and high-growth firms). This implies that under the current size-centered and broad-based support structure, policy resources are being allocated more to firms with relatively lower performance, and it shows that the function of selecting and providing intensive support to firms with high productivity and growth potential is insufficient.

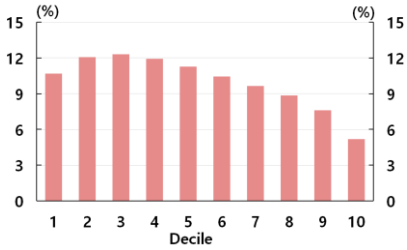
Government support tends to flow more toward SMEs with lower productivity, profitability, and growth potential.

[Figure 4.8] Share of Government Support by Capital Productivity Decile[1),2)]



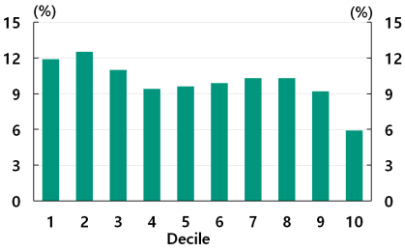
Notes: 1) Share of support funds by capital productivity decile relative to total government support
2) Excludes micro-enterprises
Source: Linked data from SBR and NICE business database

[Figure 4.9] Share of Government Support by ROA Decile[1),2)]



Notes: 1) Share of support funds by ROA decile relative to total government support
2) Excludes micro-enterprises
Source: Linked data from SBR and NICE business database

[Figure 4.10] Share of Government Support by Sales Growth Rate Decile[1),2)]



Notes: 1) Share of support amounts by sales growth rate decile relative to total government support
2) Excludes micro-enterprises
Source: Linked data from SBR and NICE business database

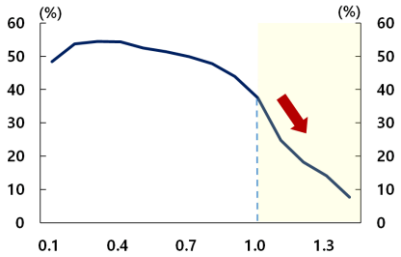
② Crossing the “threshold” leads to a reduction in support and an expansion of regulations.

40. SME eligibility criteria can function as a policy “threshold” that separates firms subject to government support and regulation, thereby inducing firms to avoid growth and potentially undermining the dynamism of the growth ladder from SMEs to mid-sized enterprises and ultimately to large firms. It has been pointed out that the Peter Pan syndrome can arise when government support is suspended as an SME transitions into a mid-sized enterprise[22]. Analysis of government support by sales bracket provides empirical evidence of such incentives. While approximately 40% of firms located in the bracket just below the threshold (0.9 to 1.0 times the reference sales) receive government support, the beneficiary rate drops significantly for firms that exceed the threshold even by a small margin (Figure 4.11). The surge in additional regulations applied as asset size increases also serves as a factor strengthening growth avoidance incentives. In particular, when a firm transitions from an SME to a mid-sized enterprise due to its asset size exceeding 500 billion KRW, it faces 126 additional regulations. In fact, the primary factors cited by mid-sized enterprises when considering a return to SME status include the loss of tax incentives (83.7%), reductions in policy finance support (60.4%), and industry restrictions under the SME-appropriate business sector system[23](24.8%) (Figure 4.13). The pattern observed in the empirical analysis of Chapter 3—where the growth-enhancing effects of government support weaken near these "thresholds"—can be interpreted in connection with these institutional factors.

[22] Ji (2015) and Choi et al. (2024) confirmed a tendency to intentionally suppress employment to maintain government support under the previous SME criteria based on the number of regular employees. In contrast, studies from abroad, including Garicano et al. (2016) and Gourio and Roys (2014), document firm bunching behavior aimed at avoiding labor regulations at the 50-employee threshold.

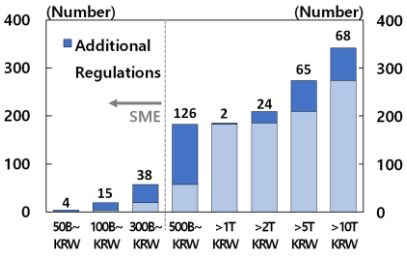
[23] This system protects SMEs by restricting the entry and expansion of large corporations in specific product categories and business areas. If a firm in such an industry loses its SME status, it may continue its existing operations, but further expansion is restricted.

[Figure 4.11] Proportion of SME Support Recipients by Sales Bracket[1),2)]



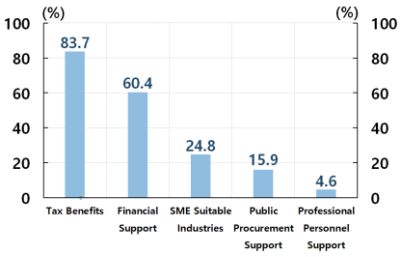
Notes: 1) The x-axis shows standardized sales (actual/eligibility threshold); values closer to 1 indicate greater proximity to the cutoff
2) Excludes micro-enterprises
Source: Statistical Business Register (SBR)

[Figure 4.12] Regulations by Asset Size[1)]



Notes: 1) For firms with assets below KRW 5 trillion, regulations are counted at the individual firm level, whereas for entities with assets of KRW 5 trillion or more, regulations are counted at the business group level.
Source: Federation of Korean Industries

[Figure 4.13] Factors Considered for Reverting to SME Status[1)]



Notes: 1) Sum of 1st and 2nd rankings, as of 2023
Source: Basic Statistics on Middle-Market Enterprises

③ Insufficient Support and Institutional Systems for the Exit of Distressed Firms

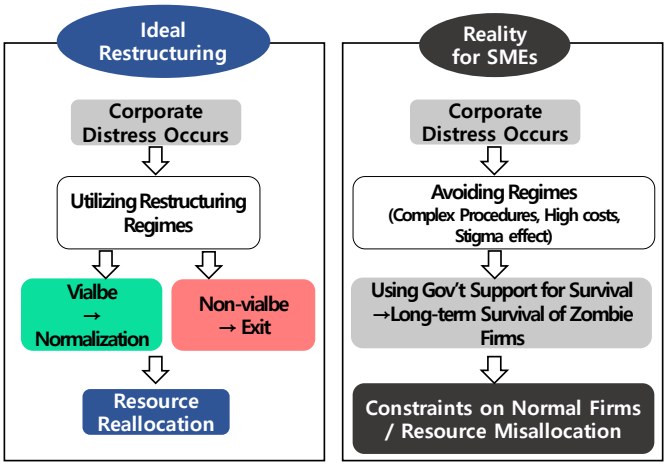
41. While institutional mechanisms for the exit of distressed firms and business restructuring are in place, their practical utility is assessed to be low from the perspective of SMEs. The current corporate restructuring system is dualized into court-led rehabilitation proceedings (Debtor Rehabilitation and Bankruptcy Act) and creditor-led workouts (Corporate Restructuring Promotion Act), complemented by the business restructuring system under the Special Act on Improving Corporate Vitality (the so-called "Corporate Vitality Act"). However, most of these systems are designed with a focus on large enterprises, and their complex, prolonged procedures result in limited accessibility for SMEs. Furthermore, the stigma effect, where firms filing for rehabilitation are labeled as "distressed" in financial and business relations and subsequently face disadvantages, acts as a significant barrier preventing SMEs from utilizing these institutional frameworks (Park, 2021; Koo, 2024; Hong, 2025)[24].

[24] Park (2021) pointed out that after the conclusion of rehabilitation proceedings, firms struggle to secure private financing and become dependent on policy finance, while trading partners tend to avoid credit transactions. Hong (2025) reached a similar conclusion from an analysis of the external financing behavior of firms filing for rehabilitation. Koo (2024) noted that ex-post restructuring systems deepen the stigma effect, thereby lowering the probability of successful restructuring.

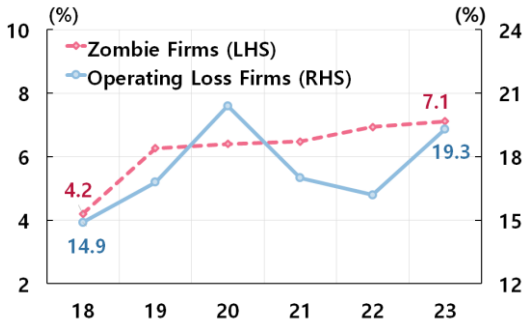
42. Owing to these limitations of the restructuring framework, unproductive firms are not exiting the market in a timely manner. Under an efficient restructuring system, firms with viable prospects should restore normal operations through debt restructuring or business reorganization, while firms with little chance of rehabilitation should exit the market timely. However, the current system does not operate smoothly in this regard: as firms with weak competitiveness remain in the market for prolonged periods, it has been pointed out that government financial support is sometimes used to keep distressed firms afloat. Indeed, an analysis linking the SBR with the NICE financial statements database shows that the share of government support received by zombie firms increased from 4.2% in 2018 to 7.1% in 2023, including during the COVID-19 period (Figure 4.15). Over the same period, the share of government support provided to loss-making firms also rose from 14.9% to 19.3%. These patterns suggest that a portion of policy support may have been used to sustain zombie firms rather than to enhance productivity or facilitate restructuring.

While appropriate restructuring for SMEs remains insufficient, the share of government support provided to zombie firms has been increasing.

[Figure 4.14] Restructuring: Ideal vs. Reality



[Figure 4.15] Share of Government Support for Zombie firms[1] and Firms with Operating Losses[2]



Notes: 1) Share of support funds for firms with an Interest Coverage Ratio (ICR) of less than 1 for three consecutive years
2) Share of support funds for firms that recorded operating losses
Source: Linked data from the Statistical Business Register (SBR) and NICE business database

④ Duplication of Support Programs and Fragmentation of Policy Formulation and Delivery Systems

43. In addition, inefficiencies arise from the duplication of SME support programs and the fragmentation of policy formulation and delivery systems. As the number and budget of SME support programs have significantly expanded since the 2000s, concerns regarding multiple ministries and agencies redundantly executing projects with similar objectives have been consistently raised. Currently, government SME support programs exceed 1,700 in number, with various central ministries, affiliated agencies, and local governments operating their own separate programs. This structure leads to overlapping support, increased administrative costs, and difficulties in performance management, thereby undermining policy consistency and efficiency. OECD (2024) and An et al. (2021) also point out that Korea's SME support framework is complex and fragmented, necessitating institutional simplification and the strengthening of inter-ministerial coordination mechanisms. While the government has sought to alleviate duplication and improve systematization through measures such as the establishment of the SME Policy Deliberation Committee (2019) and the creation of the SME Integrated Management System (SIMS), limitations still remain in terms of inter-program linkage and strategic consistency. In contrast, major countries in the US and Europe operate centralized management systems or rely on a single ministry to oversee and coordinate support programs, thereby enhancing policy efficiency and accountability (see Box 5).

44. In summary, the current SME support system is characterized by the following structural features: ① sales-centered size criteria and broad-based support that are not sufficiently linked to productivity; ② support and regulatory thresholds that can induce the "Peter Pan syndrome"; ③ restructuring and exit systems that are unsuitable for SMEs; and ④ a fragmented policy delivery system. As identified in Chapter 3, this institutional design acts as a significant underlying cause for the sluggish performance or counterproductive effects observed in terms of productivity enhancement, the strengthening of dynamism, and resource allocation efficiency. In the following Chapter 5, we conduct a quantitative analysis using a general equilibrium model to examine the effects of improving these institutional structures on overall economic efficiency and growth.

5. Economic Effects of Improving Inefficiencies in SME Support Policies

45. While the analysis up to the previous chapter mainly examined partial equilibrium effects through micro-data, this chapter quantitatively evaluates the impact of SME policy design on overall economic efficiency, growth, and wages using a general equilibrium model.

46. The structural model was designed to reflect the characteristics of SMEs/start-ups, the structure of SME policy, and the problems such as scale criteria, broad-based support, age-productivity relationship, Peter Pan syndrome, zombie firms/restructuring costs, etc. (see BOX 6).

- First, a heterogeneous firm model with financial constraints was used to reflect the reality that SMEs without collateral have limited access to finance and that financial support accounts for the largest proportion of policy tools.
- Second, companies below the support threshold were set to receive the same interest rate benefits, implementing the scale criteria and broad-based support structure of the current system in the model.
- Third, the model was designed to reproduce two facts observed in the data: ① the weak correlation between firm size and capital productivity [25] (Figure 5.1), and ② the relatively high capital productivity of low-age companies under financial constraints (Figure 5.2).
- Fourth, capital adjustment costs were introduced to reflect frictional factors in restructuring examined in the previous chapter, and the proportion of zombie firms was matched to data.

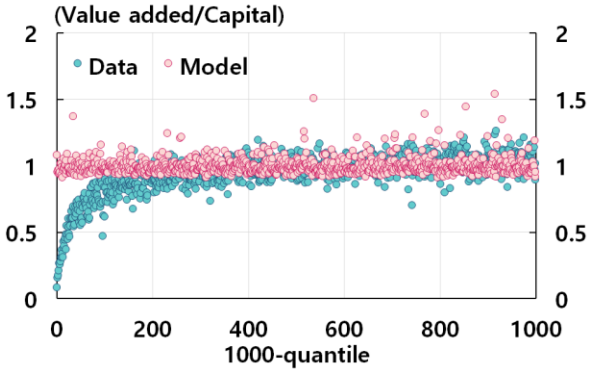
47. This model structure allows for the simultaneous consideration of two conflicting effects of government support, enabling a more balanced policy evaluation. ① If some companies cannot reach efficient production levels due to financial constraints, government support can help them reach the efficient levels faster, alleviating inefficient resource allocation in the economy. ② Additional support

[25] The model and the data exhibit very similar patterns across most ranges, but show some discrepancies in the smallest size quantiles. This is because, in the real-world data, very small firms can exist even with extremely low productivity. In contrast, in the model, low-productivity firms exit the market immediately, leading to a gap between the data and the model in these lower quantiles. However, the production of firms in the bottom 25% of value-added in the data is small, accounting for only 1.7% of the total.

for companies that have already escaped financial constraints and do not have high capital productivity can induce excessive production, increasing resource misallocation. In addition, support based on scale criteria induces corporate behavioral changes such as Peter Pan syndrome, delaying growth/scale-up and potentially further hindering efficiency.

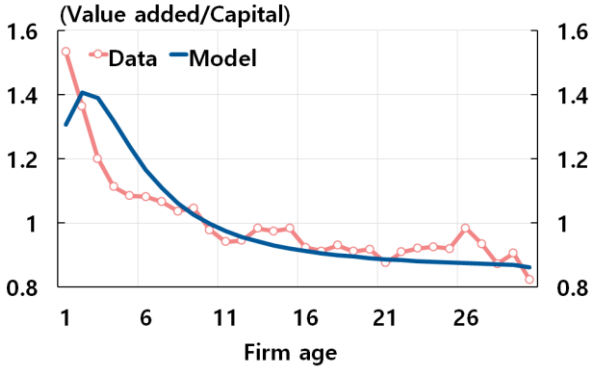
The model successfully captures the empirical relationships among firm size, firm age, and capital productivity.

[Figure 5.1] Capital Productivity by Size[1)]



Notes: 1) For each firm (excluding micro-enterprises), operating asset is standardized at the detailed industry level, and the ratio of total value added to total standardized operating asset is computed by value-added quantile
Source: SBR and NICE form data, Author's calculations

[Figure 5.2] Capital Productivity by Age of SME[1)]



Notes: 1) For each firm (excluding micro-enterprises), operating asset is standardized at the detailed industry level, and the ratio of total value added to total standardized operating asset is computed by firm age
Source: SBR and NICE form data, Author's calculations

Revenue → Age Criteria Change Improves Production and Wage Substantially.

48. First, we estimated the expected effects of institutional change from the current revenue scale criteria to firm age criteria. Ideally, subsidizing companies based on innovation and productivity is most desirable, but considering information constraints and administrative costs, it is difficult to apply in real world. Therefore, the simulation assumed institutional change based on firm age as a realistic alternative. The reasons for choosing age among various possible selection criteria are: First, as confirmed in the previous analysis, the lower the age, the higher the capital productivity. Second, age is clearly defined and measured, so selection costs for support agencies are low, and it is difficult for companies to arbitrarily adjust, making it less likely to induce distorted behavior to avoid criteria.

49. According to the analysis, if the subsidy criteria is changed from "SMEs based on revenue scale[26]" to "companies with a age of 7 years or less", while maintaining the SME subsidy budget scale[27], total production is estimated to increase by 0.45% and wage is estimated to increase by 1.08%, as resources are reallocated to low-age companies with high capital productivity. This implies that significant growth effects are possible just by changing the subsidy target without additional budget input (Table 5.1).

50. Specifically, decomposing the effect of total production change is as follows. Changes in total production of the economy due to policy changes can be divided into: ① Changes in resource allocation efficiency between companies under given production factors in the entire economy, ② Changes in total capital stock, and ③ Changes in labor input due to firm entry/exit[28]. As a result of the decomposition, the effect of enhancing resource allocation efficiency due to the switch to age criteria accounted for most of the total production increase at 0.43%p. This is mainly due to the improvement of overall economic resource allocation as government subsidy moved to low-age companies with higher capital productivity, and also includes the mitigation effect of the Peter Pan syndrome (0.06%p). Also, the increase in total capital stock due to economic scale expansion brought a growth enhancement effect of 0.07%p, while there is a growth reduction effect of 0.05%p due to the additional entry of inefficient companies because of the subsidy for low-age companies. (Figure 5.3)

51. Although Peter Pan syndrome is a local phenomenon appearing in companies near the government subsidy threshold, alleviating it reduces overall economic inefficiency and has a significant positive impact on growth. As shown in the empirical analysis in Chapter 3, firms subject to the Peter Pan syndrome are limited to mid-sized firms and potential mid-sized firm candidates located near policy thresholds. While their number is relatively small, their large individual scale means that they account for a non-negligible share of aggregate production. As a result of the preceding simulation, mitigating Peter Pan syndrome for companies near the threshold by switching government subsidy criteria from revenue to age resulted in a 0.06% increase in total production,

[26] The size thresholds in the model were calibrated to match the actual number of mid-sized and large firms
[27] The budget for SME subsidy by central and local governments in 2023, representing roughly 1.35% of GDP.
[28] The detailed decomposition methodology is described in BOX 8.

indicating that its economic effect is significant (Figure 5.3).

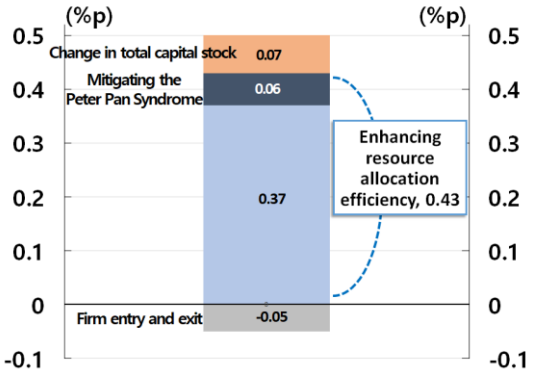
Expected Effects of Shifting from Size-based to Age-based Criteria

[Table 5.1] Production and Wage Change from Size → Age Criteria

	Production Change	Wage Change
Revenue Criteria → Age Criteria	+0.45%	+1.08%

Source: Author's Calculation

[Figure 5.3] Decomposition of Production Change



Source: Author's Calculation

Total Production Increases by 0.227% if Capital Disposal Costs Drop by 10%.

52. Meanwhile, it was confirmed that institutional improvements lowering friction and costs in the restructuring process can also bring significant growth effects.

53. For this analysis, costs in the corporate restructuring process were introduced into the model, and the economic effects of smoothing this process were analyzed. Frictions arising during corporate restructuring stem from various factors, including capital transfer costs, legal and institutional frameworks, financial practices, and stakeholder coordination; however, it is difficult to explicitly incorporate all of these elements into the model. The analysis in this report simplified these complex factors by setting adjustment costs[29] that occur when companies dispose capital in the model, and adjusted this cost to reproduce the proportion of zombie firms observed in data. Then, assuming a situation where restructuring procedures become smoother and adjustment costs are lower, the effects of improving resource allocation and reducing zombie firms were quantitatively evaluated (See BOX 9 for detail).

[29] Since corporate restructuring typically involves the sale and transfer of capital, it inevitably incurs costs. These costs delay the process of disposing assets for entrepreneurs suffering from persistent losses, thereby allowing zombie firms to persist in the market.

54. These restructuring costs cause two types of inefficiencies in the overall economy. First, as corporate restructuring is delayed, production factors are excessively tied up in low-productivity companies, increasing inefficiency in the economy. Second, as concerns grow that investment may not be returned due to adjustment costs after investment, it stimulates investors' risk aversion, potentially causing a negative effect of shrinking new investment.

55. The analysis showed that there is a significant production enhancement effect if restructuring costs are lowered through efficient asset sales and buyer matching, and the establishment of restructuring platforms. If adjustment costs are lowered by 10%[30] in the model to mitigate overall restructuring friction to a level similar to the US and Japan, total production is estimated to increase by 0.227% (Table 5.2). 0.114%p was attributed to improved resource allocation efficiency, and 0.113%p was attributed to reduced investment risk and expanded capital investment. Also, as restructuring process become smoother, the proportion of zombie firms decreases from 13.22% to 12.99%[31].

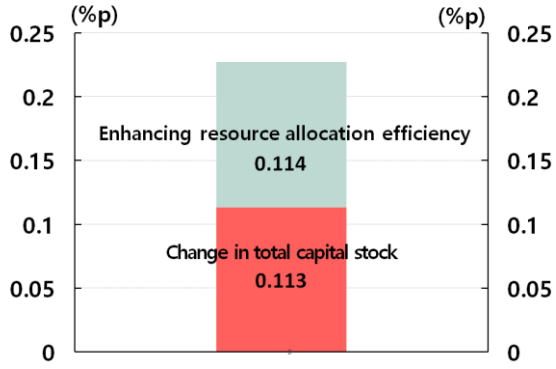
Expected Effects of Reducing Structural Adjustment Costs

[Table 5.2] Effect of Reducing Capital Adjustment Costs

	Production Change	Proportion of Marginal Firm
Capital Adjustment Cost 10% ↓	+0.227%	-0.23%p

Source: Author's Calculation

[Figure 5.4] Decomposition of Production Change



Source: Author's Calculation

[30] Specifically, we assume a scenario of structural adjustment improvement by approximately 10%, where the adjustment cost incurred when a marginal firm liquidates its capital within a year is reduced by 2 percentage points (i.e., one-tenth of 20%) from the initial value of 20% of the capital stock. This magnitude of reduction is comparable to raising Korea's 'Resolving Insolvency Score' (82.9) in the World Bank's *Doing Business (2020)* to the levels of the United States (90.5) or Japan (90.2)..

[31] The initial share of zombie firms was set at 13.22%, which is the average share (based on the value-search data) during the pre-COVID-19 period from 2010 to 2019. During this period, the standard deviation of the marginal firm share was 1.2 percentage points..

56. In summary, the general equilibrium analysis shows that there is a room for 0.4~0.7% of total production increase without increasing the budget simply by changing *who*, by *what* criteria, and *how* to subsidize and restructure. This implies that the core problem of the current system lies not in the *quantity* of subsidy but in target selection and incentive structures, and that improving institutional design has significant potential for enhancing growth and dynamism through the SME sector.

6. Conclusion and Policy Recommendations

57. Despite its substantial share in the economy, Korea's SME sector continues to face structural limitations in terms of productivity, scale-up, and dynamism. The productivity gap with large firms remains wide, successful transitions from SMEs to mid-sized enterprises are limited, and the exit of zombie firms has been delayed. While innovation investment has grown in volume, tangible outcomes have yet to materialize.

58. Nevertheless, SME support policies have delivered clear results in terms of quantitative growth and survival stability, including higher sales, increased employment, and reduced exit probabilities. In particular, government support has played an important role in alleviating financing constraints faced by SMEs and supporting short-term growth and job creation. These findings suggest that continued support for SMEs and start-ups remains necessary going forward.

59. At the same time, synthesizing evidence from empirical analysis, institutional assessment, and model-based analysis reveals that the current support system has not sufficiently addressed the structural weaknesses of the SME sector and may, in some areas, have even reinforced them. While the effects on productivity, profitability, and investment are limited, a range of adverse side effects have been observed, including negative externalities associated with the expansion of zombie firms, the spread of the "Peter Pan syndrome," delays in restructuring, and crowding-out of private finance. These outcomes appear to stem from institutional shortcomings such as an excessive reliance on sales-based eligibility criteria weakly correlated with productivity, support and regulatory thresholds that may induce growth avoidance, inadequate exit mechanisms for non-viable firms, and a fragmented and overlapping support program structure, suggesting significant room for improvement in identifying and fostering innovative SMEs. Overall, the analysis underscores that the central challenge lies not in the scale of support, but in how support is designed and implemented—specifically, the criteria and incentive structures governing SME policies.

Accordingly, future SME support policies require institutional reforms focused on: ① refining eligibility criteria and leveraging private-sector capabilities, ② designing growth-friendly policy frameworks, ③ establishing effective restructuring and exit mechanisms, and ④ building a one-stop integrated platform encompassing all support programs

60. Based on this assessment, this report proposes four policy directions to redesign the SME support system around growth, innovation, and economic dynamism.

61. First, eligibility criteria should be refined and private-sector capabilities more actively leveraged. Rather than relying excessively on simple scale-based indicators such as sales or assets, indicators of firm quality—including firm age, productivity, and innovation capacity—should serve as core criteria for selecting support recipients. In particular, firm age is strongly correlated with productivity, administratively easy to measure, and difficult to manipulate, making it a useful complementary criterion[32]. Firms that have received repeated support over an extended period should only be granted continued assistance if clear evidence of growth and innovation performance is demonstrated; otherwise, routine and automatic support should be scaled back. Conversely, start-ups and innovative firms should be selected more proactively using performance-based indicators—such as R&D intensity, patent activity, and export performance—alongside assessments of technological and business capabilities. Private-sector screening and investment expertise should be more actively utilized in the selection process, and the government should gradually shift its role from a direct provider of funds toward that of a coordinator and risk-sharing partner that facilitates private participation[33]. To this end, an ecosystem conducive to private risk capital—such as venture capital, angel investment, and crowdfunding—should be further developed for innovative SMEs. In addition, programs that link policy finance to private investment outcomes, such as the TIPS program, should be further enhanced, with qualitative evaluations led by private actors and public funding tied to those assessments.

62. Second, growth-friendly institutional design is essential. To mitigate the Peter Pan syndrome, complementary indicators that are difficult to manipulate (such

[32] According to Hong (2024), out of 58 financial support programs available in 2024, only three specified firm age as a criterion.

[33] A prime example is the British Business Bank (BBB) in the UK. Instead of directly supplying funds to SMEs, the government jointly conducts a "Growth Potential Test" with private financial institutions to select promising SMEs and shares the associated risks.

as firm age) should be used in parallel, and customized support tailored to firms' growth stages should be strengthened. Moreover, performance-based reward mechanisms should be refined so that firms with proven results automatically gain access to follow-up support and incentives, thereby reinforcing incentives for growth and innovation. For example, Korea's KOSBIR program could draw lessons from the U.S. SBIR system[34], which can lead to commercialization through phased performance evaluations. Beyond financial assistance, non-financial support—such as export promotion, workforce development, access to distribution channels, R&D support, and AI transformation—should also be expanded in areas where SMEs face inherent disadvantages when acting alone. International examples such as Bpifrance's Accelerator program in France, the U.S. Small Business Development Centers (SBDC), and Canada's Industrial Research Assistance Program (IRAP) illustrate how management coaching, technical advisory services, training, and networking can effectively support SME scale-up.

63. Third, restructuring and exit framework tailored to SMEs must be refined. Given the practical constraints SMEs face in accessing existing procedures, the system should be improved to ensure a smooth cycle of "early identification of distress–voluntary restructuring–orderly exit," enabling viable firms to recover early through debt and business restructuring while allowing non-viable firms to exit timely. Priority should be placed on strengthening early-warning systems to identify distressed firms early, allowing for preemptive structural improvement or business transition before risk signals materialize. Furthermore, for severely distressed firms in areas where market mechanisms fail, the introduction of a third-party restructuring body involving both public and private sectors should be considered. Japan's experience with public–private restructuring frameworks—such as the SME Revitalization Council and the Regional Economy Vitalization Corporation of Japan (REVIC)—provides useful reference points[35]. Given that pre-packaged autonomous

[34] The U.S. SBIR (Small Business Innovation Research) program mandates the allocation of a certain percentage of federal R&D budgets to innovative SMEs and is designed so that only firms with verified technical achievements advance to subsequent stages (Phase I→II→III). In particular, the commercialization stage (Phase III) is structured to transition from government funding to private investment, creating a virtuous cycle of "technology development–commercialization–market entry." While Korea's KOSBIR was introduced by benchmarking this system, it has been pointed out that the effectiveness of its phased evaluations and commercialization linkages remains relatively low (Kim et al., 2022).

[35] The SME Revitalization Council is an organization where regional financial institutions and experts jointly participate to mediate and coordinate business reorganization and debt adjustments for firms showing signs of distress. The Regional Economy Vitalization Corporation of Japan (REVIC) is a support body jointly funded by the government and private financial institutions that assists corporate rehabilitation through business reorganization planning, financing, and management consulting.

restructuring (pre-ARS) and hybrid restructuring schemes are being piloted domestically in 2025[36], these mechanisms should be further refined to enhance their effectiveness.

64. Fourth, the support system should be integrated and strategically streamlined through the establishment of a one-stop integrated platform encompassing all policy agencies and instruments. At present, information provision (e.g., Bizinfo, SME24), program applications (by ministry or program-specific websites), and support history management (SIMS) are fragmented. This makes it difficult for firms to identify relevant support options at a glance and for the government to systematically manage screening, implementation, and performance evaluation[37]. Integrating these functions into a single platform would allow firms to identify and apply for appropriate support across all stages of their life cycle, while enabling the government to manage the entire support process in an integrated manner[38]. The government's ongoing initiative to develop an integrated platform[39] should be refined to better align support with firms' growth stages. AI-based recommendation and consulting functions should be introduced to suggest optimal support programs based on firms' operational data, while features facilitating business exit and re-entry—such as asset disposal and buyer matching—should be made easily accessible. Policy agencies should also actively utilize the big data accumulated on the platform in policy design, implementation, and evaluation.

65. In conclusion, the key challenge facing SME support policy lies not in whether to provide more support, but in how to provide support more effectively. By selecting promising firms based on appropriate criteria, designing institutions and incentives that foster growth and restructuring, and effectively mobilizing private capital, information, and capabilities, the SME sector can evolve into a genuine core pillar supporting sustainable growth, innovation, and inclusiveness in the Korean economy.

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[36] Pre-ARS (Autonomous Restructuring Support) is a system that supports firms in pursuing voluntary restructuring with creditors before the formal commencement of rehabilitation proceedings. Hybrid restructuring allows a firm to continue operations while simultaneously utilizing court-led rehabilitation support and conducting negotiations with creditor groups.

[37] According to the 2025 Survey on SME Support Policies (IBK Economic Research Institute, 2025), 35.3% of surveyed firms responded that they were unaware of the specific details of support policies, and 38.5% identified "lack of customized information provision" as a key area requiring improvement.

[38] For instance, Canada operates an integrated portal centered around the Business Development Bank of Canada (BDC), a state-owned development finance institution. In cooperation with private financial institutions and industry, it provides startup capital, growth financing, consulting, and private investment matching in one place. The OECD (2022) cites this as a best practice for public-private cooperative financial support platforms.

[39] The Ministry of SMEs and Startups is pursuing a project to build an "SME Integrated Support Platform," aiming to launch the service in the second half of 2026. The goal is to integrate and upgrade existing scattered service functions to enable one-stop program applications and customized recommendations.

BOX 2 Definition of Small and Medium-sized Enterprises (SMEs) in Korea

Under the Framework Act on Small and Medium Enterprises, SMEs in Korea are defined as firms whose three-year average sales and total assets (not exceeding KRW 500 billion) fall below industry-specific thresholds. Prior to the 2015 revision, SME classification was based on the number of regular employees, but this approach faced two main limitations: (1) industry-specific differences, and (2) distortions in employment incentives.

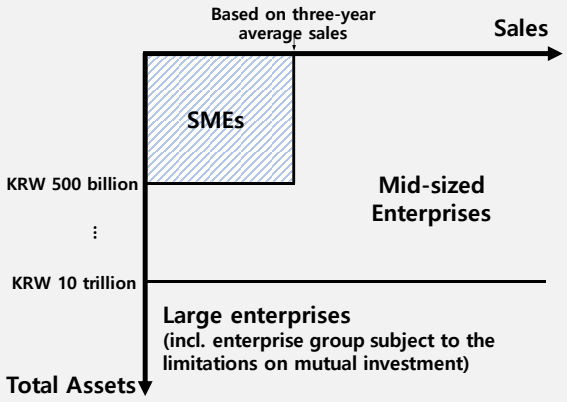
First, in terms of industry-specific differences, the employee-based criteria placed labor-intensive industries, such as apparel and textiles, at a disadvantage relative to capital-intensive industries in terms of fairness. Second, with respect to job creation, firms seeking to maintain SME status had incentives to cap employment at or below the regulatory threshold, which in some cases led to distortions such as an increased reliance on non-regular workers.

To address these distortions, the government revised the criteria for classifying SMEs in 2015 by introducing thresholds based on sales and total assets. Subsequently, reflecting inflation and sector-specific growth rates, the maximum upper threshold was raised from KRW 150 billion to KRW 180 billion in September 2025.

Meanwhile, the OECD, for statistical purposes, classifies SMEs solely based on the number of employees, defining micro enterprises (1–9 employees), small enterprises (10–49 employees), and medium-sized enterprises (50–249 employees). Individual member countries apply their own definitions depending on economic conditions and policy objectives, with criteria typically based on combinations of sales, assets, and employment. In general, Korea's SME thresholds are more inclusive than those of many other countries.

In this report, unless otherwise specified, the term SMEs refers to firms defined under Korea's legal SME criteria. However, depending on analytical needs, employment-based definitions are also used in parallel. For domestic statistics, SMEs are defined as firms with fewer than 300 employees, consistent with official Korean statistical classifications. For international comparisons, the OECD definition is applied, classifying firms with fewer than 250 employees (or 10–249 employees excluding micro enterprises) as SMEs.

[Figure 1] SME Classification in Korea



Source: Ministry of SMEs and Startups

[Table 1] SME Classification Criteria in Major Countries

Country	Classification Criteria
Japan	Capital of JPY 300 million or less, or 300 or fewer employees (manufacturing, construction, transport, etc.)
United States	500 or fewer employees (manufacturing); sales of USD 65 million or less (services)
European Union	250 or fewer employees and annual turnover of EUR 50 million or less, or total assets of EUR 43 million or less
United Kingdom	250 or fewer employees and annual turnover of GBP 54 million or less, or total assets of GBP 27 million or less (meeting at least two criteria)

Source: National governments

[Table 2] SME Size Thresholds by Industry (Based on Average Annual Sales)

Main Industry	Industry Code	Size Threshold
1. Manufacture of pulp, paper, and paper products	C17	≤ KRW 180 billion
2. Manufacture of basic metals	C24	
3. Manufacture of electrical equipment	C28	
4. Manufacture of wearing apparel, clothing accessories and fur articles	C14	≤ KRW 150 billion
5. Manufacture of leather, luggage and footwear	C15	
6. Manufacture of furniture	C32	
7. Manufacture of food products	C10	≤ KRW 120 billion
8. Manufacture of chemicals and chemical products; except pharmaceuticals and medicinal chemicals	C20	
9. Manufacture of rubber and plastics products	C22	
10. Manufacture of fabricated metal products, except machinery and furniture	C25	
11. Manufacture of other machinery and equipment	C29	
12. Manufacture of motor vehicles, trailers and semitrailers	C30	
13. Manufacture of other transport equipment	C31	
14. Construction	F	
15. Wholesale and retail trade	G	
16. Agriculture, forestry and fishing	A	≤ KRW 100 billion
17. Mining and quarrying	B	
18. Manufacture of tobacco products	C12	
19. Manufacture of textiles, except apparel	C13	
20. Manufacture of wood and of products of wood and cork; except furniture	C16	
21. Manufacture of coke, briquettes and refined petroleum products	C19	
22. Manufacture of electronic components, computer; visual, sounding and communication equipment	C26	
23. Other manufacturing	C33	
24. Electricity, gas, steam and air conditioning supply	D	
25. Water supply	E36	
26. Transportation and storage	H	
27. Information and communication	J	
28. Manufacture of beverages	C11	≤ KRW 80 billion
29. Printing and reproduction of recorded media	C18	
30. Manufacture of pharmaceuticals, medicinal chemical and botanical products	C21	
31. Manufacture of other non-metallic mineral products	C23	
32. Manufacture of medical, precision and optical instruments, watches and clocks	C27	
33. Sewage, waste management, materials recovery (except Water supply)	E(excluding E36)	
34. Business facilities management and business support services (except Rental)	N(excluding N76)	
35. Maintenance and repair services of industrial machinery and equipment	C34	≤ KRW 60 billion
36. Professional, scientific and technical activities	M	
37. Human health and social work activities	Q	
38. Arts, sports and recreation related services	R	
39. Repair and other personal services (except Membership organizaitons)	S(excluding S94)	
40. Accommodation and food service activities	I	≤ KRW 40 billion
41. Financial and insurance activities	K	
42. Real estate activities	L	
43. Rental and leasing activities; except real estate	N76	
44. Education	P	

Source: Ministry of SMEs and Startups (Korea)

BOX 3 Growth Cases of Innovative SMEs

Startups and innovative SMEs are creating new growth engines globally and contributing to enhancing economy-wide productivity. For instance, Tesla has grown into a global company producing 1.8 million electric vehicles annually (as of 2023), playing a leading role in shifting the automotive industry paradigm from fossil fuels to electric vehicles. It has also contributed to creating manufacturing jobs in the U.S. and the growth of related industries. Airbnb, an accommodation sharing platform, connects 8 million listings across 220 countries worldwide, contributing to the development of local tourism industries and creating over 1 million jobs. Sweden's Spotify established "streaming" rather than "ownership" as the method of music consumption, accelerating the digital transformation of the global music industry. Uber expanded a new form of employment called "gig work" through its ride-sharing service, providing income opportunities to approximately 7.8 million drivers and delivery personnel (as of 2024). These cases demonstrate that innovative SMEs can lead change, create new markets, and substantially contribute to economic growth through the expansion of employment and investment, as well as productivity improvement.

Early-stage government support policies served as a crucial foundation for the growth of these innovative firms. For example, Tesla was able to expand production facilities and establish a mass-production system for EVs early on using low-interest loans from the U.S. Department of Energy's Advanced Technology Vehicles Manufacturing (ATVM) Loan Program. Qualcomm is cited as a representative success story of leveraging the SBIR (Small Business Innovation Research) program, a U.S. R&D support scheme8. The support received through participation in SBIR research projects during its early stages laid the groundwork for Qualcomm to lead CDMA wireless communication standards and grow into a global semiconductor company

[Table 1] Global Growth and Innovation Cases of SMEs

Company	Founded/Country	Major Business	Performance	Industrial & Economic Impact
Tesla	2003 / USA	Electric Vehicle Manufacturing	Annual vehicle deliveries: 20,000 (2013) → 1.8 million (2023)	Leading EV transition, creating manufacturing jobs, forming regional clusters
Airbnb	2008/ USA	Accommodation Sharing Platform	8 million listings in 220 countries, Over 100 million users (2023)	Expanding local tourism industries, creating 1 million jobs, increasing host household income
Spotify	2006/ Sweden	Music Streaming	500 million monthly users, $10 billion revenue (2024)	Paradigm shift to streaming consumption, recovery of global music industry revenue
Uber	2009/ USA	Ride-hailing & Delivery Platform	130 million monthly users, $37.2 billion revenue (2023), 7.8 million drivers/couriers (2024)	Expansion of platform economy & gig work, increasing revenue for local small businesses
ByteDance/ TikTok	2012/ China	AI-based Content Platform	Users: 55 million (2018) → 1.12 billion (2023)	Revitalizing creator economy, spreading 1-person media startup models
Stripe	2010/ USA	Online Payment Fintech	Payment volume: $350 billion (2020) → $1.4 trillion (2024), 17% global market share	Improving global payment accessibility for startups, expanding digital finance infrastructure

Source: Author's compilation

BOX 4 Statistical Business Registers (SBR)

The Statistical Business Register (SBR) is a comprehensive firm-level database constructed by Statistics Korea through the integration of administrative records from various government agencies, including the National Tax Service and the four major social insurance programs. It covers all firms and establishments nationwide and provides time-series data at annual, quarterly, and monthly frequencies from 2011 onward.

Starting in 2018, items related to SME support programs were added. The dataset covers both incorporated and unincorporated businesses and allows for the time-series tracking of firm identifiers, industry and size classifications, employment, and records of establishment, closure, and other changes, making it suitable for analyzing SME dynamics.

Meanwhile, in this report, the SBR is merged with the NICE financial statements database to construct financial variables. For the analysis of SME status and size distribution, annual data for 2011–2023 are used, while annual data for 2018–2023 are employed to examine the effects of government support.

[Table 1] Areas of SME Support

Category		Description
Finance	Loans	Provision of policy loans to SMEs facing capital constraints
	Guarantees	Credit guarantees to support SMEs' borrowing from financial institutions
	Insurance	Export and trade insurance support
Technology	R&D Support	Financial support for technology development by SMEs, including government-funded and publicly commissioned R&D projects
	Technology Protection	Support for intellectual property rights, including patents, utility models, and prevention of technology leakage
	Commercialization	Support for in-house technology development and commercialization through technology transfer from public research institutes and large firms
	Consulting	Consulting services to address technical challenges during SMEs' technology development processes
	Infrastructure Utilization	Support for the use of research facilities, equipment, and testing infrastructure
	Certification & Testing	Support for obtaining product and system
Human Resources	Employment Support	Wage subsidies and employment retention support for SMEs
	Workforce Development	Support for training, re-skilling, and hiring of skilled professionals
	Recruitment	Support for recruitment of overseas talent and highly skilled professionals
Exports	Export Consulting	Consulting services related to overseas market entry, customs clearance, and trade practices
	Market Entry & Certification	Support for obtaining local certifications, AEO certification, and overseas regulatory approvals
	Overseas Expansion	Support for overseas exhibitions, trade fairs, buyer matchmaking, and sample branding
Domestic Demand	Market Expansion	Support for domestic marketing channels, online/offline sales platforms, and brand and design development
	Public Procurement	Support to expand SMEs' participation in public procurement

Start-ups	Start-up Consulting	Consulting and mentoring on business planning, market analysis, and commercialization
	Commercialization	Support for prototype development, pilot production, and commercialization of start-up products
	Business recovery support	Support for business facing difficulties due to changes in the business environment and for the re-entry of firms after business failure
	Location & Infrastructure	Support for incubation facilities, shared offices, and start-up clusters
Management	Training & Consulting	Support for management training, consulting, and compliance systems (e.g., HACCP)
	Facilities & Equipment	Support for facility modernization, automation, and smart factory adoption
	Operating expenses	Support for business operating costs, including insurance premiums and other related expenses
	Certification	Support for acquiring various business-related certifications (e.g., venture, main-biz, inno-biz)
Other	Comprehensive Support	Comprehensive, firm-wide support programs across multiple policy dimensions

Source: Ministry of SMEs and Startups (Korea)

BOX 5 SME Support Systems in Major Advanced Economies

SME support systems in major advanced economies exhibit several common features.

First, SME policies are formulated and implemented in an integrated manner, centered on a lead ministry and specialized agencies. In the United States, the Small Business Administration (SBA) serves as the central authority overseeing a broad range of support policies, including start-ups, credit guarantees, and public procurement. In Germany, the Federal Ministry for Economic Affairs and Climate Action (BMWK) and the public development bank KfW share responsibilities for policy design and financial execution. Similarly, in the United Kingdom, the Department for Business and Trade (DBT) delivers policy finance through the government-owned British Business Bank (BBB).

Second, financial support is primarily provided through market-complementing mechanisms that emphasize cooperation with the private sector. Rather than supplying funds directly, governments rely on risk-sharing arrangements with private financial institutions, such as credit guarantees, on-lending schemes, and venture capital match funding. For example, the UK's BBB co-invests with private banks and venture capital firms through jointly established funds to support innovative enterprises, while Germany's KfW provides funding to private banks' loan portfolios, thereby leveraging market-based credit assessment and monitoring functions.

Third, major economies operate SME-friendly restructuring and insolvency frameworks. In the United States, the Small Business Reorganization Act of 2019 introduced Subchapter V under Chapter 11, offering a simplified reorganization procedure tailored to small businesses. Germany enacted the StaRUG law in 2021, enabling creditor negotiations and preventive restructuring prior to formal court involvement. The United Kingdom introduced the Corporate Insolvency and Governance Act (CIGA) in 2020, establishing expedited debt restructuring and restructuring plan approval procedures. Japan supports voluntary restructuring through public–private mechanisms such as business revitalization (ADR), SME Revitalization Councils, and the Regional Economy Vitalization Corporation of Japan (REVIC).

[Table 1] SME Support Systems in Major Economies

Country	Lead Authority / Delivery Structure	Main Support Instruments	Restructuring & Exit Framework
USA	SBA (Small Business Administration): independent federal agency integrating policy design and implementation	Credit guarantees for private bank loans (7(a), 504), SBDC & WBC advisory services, federal procurement (8(a))	Chapter 11 with SME-specific provisions (Subchapter V): simplified, SME-friendly procedures
Germany	BMWK (policy design); KfW (federally owned development bank) executing policy finance via on-lending	On-lending policy finance, interest rate and guarantee fee subsidies, innovation and R&D support	*Insolvenzordnung* (general insolvency) + *StaRUG* (preventive restructuring): early restructuring support for SMEs
U.K.	DBT (policy design); BBB (government-owned development bank) delivering guarantees and VC matching	Enterprise Capital Funds (VC matching), credit guarantees, scale-up support programs	Traditional CVA & Administration + *CIGA 2020* (moratorium, restructuring plan), with high SME accessibility
Japan	SMEA (SME Agency under METI) formulates policy; JFC, SMRJ, and other agencies execute	Direct lending by JFC, credit guarantees, management consulting and digitalization support	SME Revitalization Councils, business revitalization ADR, and other SME-oriented restructuring infrastructure

Source: Compiled from official government sources of each country

BOX 6 A Heterogeneous Firm Model to Evaluate the Effects of Shifting SME Support Criteria from Size to Firm Age

To analyze the effects of various subsidy policies throughout the corporate life cycle in the presence of financial frictions, this study employs a heterogeneous firm model that incorporates financial frictions and dynamic capital accumulation into the span of control models of Lucas (1978) and Rosen (1982).

(1) Production Structure

Firm's production function is as follows:

$$f(m,k,l) = m\left(k^{\theta} l^{1-\theta}\right)^{\nu}$$

In this model, m represents an individual's managerial productivity, while k and l denote the quantities of capital and labor employed by the firm, respectively. Additionally, following the standard assumptions of the span of control model, we assume firm's return to Scale $\nu < 1$[40].

(2) Household

Household retire after age O, and decease at age D. The optimization problem of **retired household** is as follows:

$$v^R(a,j) = \max_{c,a' \geq 0} log\,(c) + \beta\, v^R(a', j+1) \quad for \quad O+1 \leq j \leq D$$
$$s.t. \;\; c + a' = (1 + (1-\tau_k)r)a$$
$$v^R(D+1) = 0$$

j is age, c is consumption, a is individual asset level.

Before retirement, households receive income based on their occupational choice, individual ability (z), and capital (k) in each period. They then make an occupational choice for the next period. The Bellman equation for a worker household is given by:

$$v^w(a,e,j,y=0,q) = \max_{c,a' \geq 0} log(c) + \beta E[\max_{i=w,f}(E[v^i(a',e',j+1,y',q)\big|e] + \sigma_{fe}\epsilon_i)]$$
$$s.t. \;\; c + a' = (1-\tau_l) * w * \eta_j * exp(e) + (1 + (1-\tau_k) * r) * a$$

[40] When $\nu \geq 1$, since it would be most efficient for all production to be concentrated in a single firm led by the entrepreneur with the highest ability, it is not suitable for analyzing firm distribution and cross-firm dynamics

y denotes the firm age, and q represents prior entrepreneurship status, which is used to prevent repeated subsidy for young firms., e is individual productivity that follows AR(1) process, η_j refers to age-dependent productivity. Finally, $\sigma_{fe}\epsilon_i$ represents a taste shock that influences the decision to become an entrepreneur[41].

(3) Firm

After choosing to become an **entrepreneur**, the individual decides whether to remain a small and medium-sized enterprise (SME) or grow to the large-scale firm following the realization of the productivity shock in each period. In this decision process, a minor taste shock is also assumed to exist[42].

$$v^f(a,e,j,y,q) = E[\max_{i=bf,sf}(v^i(a,e,j,y,q) + \sigma_{fs}\epsilon_i)]$$

The optimization problem of **SME entrepreneur** is as follows:

$$v^{sf}(a,e,j,y,q) = \max_{c,a'\geq 0} \log(c) + \beta E[\max_{i=w,f}(E[v^i(a',e',j+1,y',q')|e] + \sigma_{fx}\epsilon_i)]$$

$$s.t. \quad c + a' = \pi(a,e,j,y,q;w_{sf},r_{sf}) + (1 + (1-\tau_k)r) * a$$

$$\pi(a,e,j,y,q;w_{sf},r_{sf}) = \max_{l,k\leq\lambda a} exp(e) * \eta_j * \left(k^\theta l^{1-\theta}\right)^\nu - w_{sf}(y,q)l - \left(\delta + r_{sf}(y,q)\right)k$$

$$s.t. \quad exp(e) * \eta_j * \left(k^\theta l^{1-\theta}\right)^\nu \leq T\,, \qquad y' = \begin{cases} y+1 & i=f, y<Y \\ y & i=f, y=Y \\ 0 & i=w \end{cases}$$

In other words, upon choosing to be an entrepreneur, the individual earns income by employing labor and capital for production and retaining the residual after deducting wages and interest payments. Following Buera and Shin (2011), the total amount of capital an entrepreneur can mobilize is determined by multiplying their personal assets a by a specific leverage limit λ. Consequently, if an individual's assets are insufficient relative to their productivity, underinvestment occurs, leading to the misallocation of resources.

Meanwhile, entrepreneurs of small and medium-sized enterprises (SMEs) benefit from lower wages and interest rates w_{sf}, r_{sf}; however, in exchange for this subsidy, an upper limit on output T is imposed. Furthermore, such subsidy is provided only when both the firm age limit (Y) and the prior entrepreneurship criteria (q) are satisfied

[41] In this model, the Taste Shock serves two primary roles. First, at the moments when an individual decides to become an entrepreneur or when a firm exceeds the SME size threshold, the returns on capital surge, causing the value function to exhibit highly non-convex characteristics. Without the Taste Shock, solving the model would be extremely difficult (Iskhakov et al., 2017). Second, empirical data show that the exit rate of firms in their first year of operation is significantly higher than in subsequent years. By incorporating the Taste Shock, the model allows firms that entered the market 'by mistake', thereby enabling the replication of first-year exit rates through the magnitude of the Taste Shock.

[42] The Taste Shock here is introduced purely for computational purposes and is thus set to a very small value.

The optimization problem for an **entrepreneur of a large firm** is as follows:

$$v^{bf}(a,e,j,y,q) = \max_{c,a' \geq 0} \log(c) + \beta E[\max_{i=w,f}(E[v^i(a',e',j+1,y',q')|e] + \sigma_{fx}\epsilon_i)]$$

$$s.t. \quad c + a' = \pi(a,e,j;w,r) + (1 + (1-\tau_k)r)a$$

$$\pi(a,e,j;w,r) = \max_{l,k \leq \lambda a} exp(e) * \eta_j * \left(k^\theta l^{1-\theta}\right)^\nu - wl - (\delta + r)k$$

$$s.t. \quad exp(e) * \eta_j * \left(k^\theta l^{1-\theta}\right)^\nu > T\,, \qquad y' = \begin{cases} y+1 & i = f, y < Y \\ y & i = f, y = Y \\ 0 & i = w \end{cases}$$

In other words, while entrepreneurs of large firms are subject to market wages and interest rates w, r, they face no upper limit T on their output. Consequently, if the optimal level of production significantly exceeds T, an entrepreneur will choose to surpass the SME threshold and become a large firm, even at the cost of higher wages and interest rates.

(4) Stationary Equilibrium

The **stationary equilibrium** is defined as a state where, given wages and interest rates, the labor demand from entrepreneur households matches the labor supply from worker households, and the capital demand from entrepreneur households equals the aggregate capital supply. The government's budget constraint is defined such that the total amount of subsidies provided to firms is equal to the total tax revenue collected.

(5) Analysis of the Effects of Subsidy Policies

Assistance for SMEs is provided in the form of subsidies for capital inputs, which are assumed to be financed through capital income taxes. When subsidy is determined by **firm size**, resources are reallocated from firms exceeding the SME threshold T to those below it. In the case of **age-based criteria**, resources are redistributed from firms exceeding the age limit Y to those within the limit.

The comparison of economies through the simulation of changing subsidy criteria (from size-based to age-based) is conducted as follows. First, to replicate an economy with purely size-based subsidy without considering firm age, the SME threshold T is calibrated to match the actual number of large firms, and the support level is set to a 1.34%p reduction in the real interest rate[43]. Subsequently, the analysis considers the general equilibrium implications of replacing size-based support with age-based support, defined as support for firms aged seven years or younger.

[43] This amounts to approximately 1.35% of the total output within the model, which is consistent with the actual scale of government subsidy for small and medium-sized enterprises (SMEs) in the budget.

BOX 7 Calibration of Heterogeneous Firm Model

The most important parameters determining the magnitude of policy effects within the model are the persistence of productivity ρ and the level of financial constraints (leverage limit) λ. A higher persistence of productivity implies that existing firms maintain high productivity without new entry; consequently, in the long-run equilibrium, there is a higher proportion of older firms that have accumulated sufficient capital and are less constrained. Furthermore, lower financial constraints allow firms to accumulate capital more rapidly through higher leverage, leading to faster convergence toward their optimal production levels and reducing misallocation. Therefore, as ρ and λ increase, resource misallocation in the economy diminishes, which in turn reduces the scope for government policy to improve overall economic efficiency.

These two parameters are calibrated to directly match the survival rate by firm age (which increases with ρ) and the capital to output ratio by firm age (as a higher λ accelerates the transition out of underinvestment, causing the ratio to decrease more rapidly). Other parameters are set to match the firm size distribution, the proportion of mid-sized and large firms, and the convergence level of the capital to output ratio in Korea.

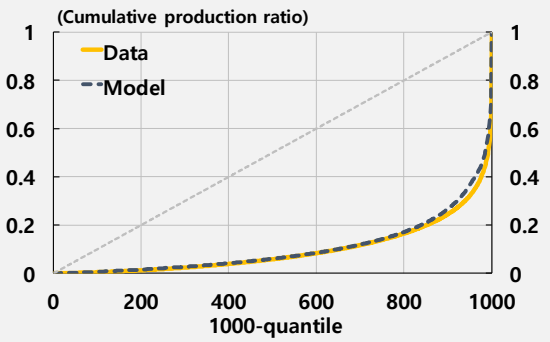
The parameters within the model, including those mentioned above, are calibrated to match the following statistics:

[Table 1] Parameters and Target Moments

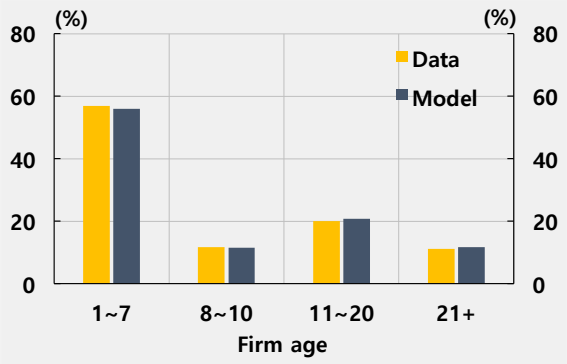
Parameters	Values	Target Moments
ρ (Persistency of Productivity)	0.988	Firm Numbers by Age
σ (Productivity Std. Dev)	0.08186	Mid-sized and Large Firm Share, Firm Numbers, Firm Size Distribution, Wage Inequality
λ (Maximum Leverage)	5	Convergence Rate of Capital Productivity, Conventional Level
ν (Span of Control)	0.85	Convergence Level of Capital Productivity, Conventional Level
θ (Cobb-Douglas Parameter)	0.3	Labor Income Share (Wage / Production) = 0.6
δ (Depreciation Rate)	0.066	Conventional Level
β (Discount Factor)	0.912	Market Interest Rate = 4%
σ_{fe} (Firm Entry Taste Shock)	0.05	Firm Numbers by Age
σ_{fs} (Firm Size Taste Shock)	0.01	Small Number
σ_{fx} (Firm Exit Taste Shock)	0.01	Small Number
T (SME Threshold)	exp(7.3)	Number of Mid-sized and large firms

The comparison between the data generated by the model, based on the aforementioned parameters, and the actual empirical data is as follows:

[Figure 1] Firm Size Distribution in Model and Data



[Figure 2] Firm Numbers by Ages



Source: SBR, NICE Data, Author's Calculation

[Table 2] Model Results and Data

Target Moments	Model	Data
Firm Numbers by Age	See Figure 2	See Figure 2, Business Demography Statistics
Capital Productivity by Age	See Figure 5.2 in the main text	See Figure 5.2 in the main text, SBR + NICE Data
Production Share of Mid-sized and large Firms	0.5619	0.5~0.53 (Financial Statement Analysis)
Firm Production Gini	0.7916	0.83 (SBR + NICE Data)

BOX 8 A Decomposition Approach to Assessing the Effects of Shifting SME Support Criteria from Size to Firm Age

We decompose the GDP growth effect resulting from the transition of SME subsidy criteria from size-based to age-based into the following components: ① improvement in resource allocation, ② changes in aggregate capital stock, ③ firm entry and exit, and ④ mitigation of the "Peter Pan syndrome". The specific decomposition methodology is as follows.

(1) Contribution of Improvement in Resource Allocation

Given the distribution of entrepreneurs and workers, as well as the aggregate capital stock, the optimal level of output is defined as the solution to the following problem.

$$Y^*(\psi_m, L, K) = \max_{l(m),k(m)} \int m\left(k(m)^\theta l(m)^{1-\theta}\right)^\nu d\psi_m$$

$$s.t. \quad \int k(m)d\psi_m = K, \quad \int l(m)d\psi_m = L$$

Optimality is achieved when the marginal productivity of each production factor is equalized across all entrepreneurs, and the solution is given as follows:

$$k^*(m) = \frac{m^{\frac{1}{1-\nu}}}{\int m^{\frac{1}{1-\nu}} d\psi_m} K, \quad l^*(m) = \frac{m^{\frac{1}{1-\nu}}}{\int m^{\frac{1}{1-\nu}} d\psi_m} L$$

$$Y^*(\psi_m, L, K) = \left(\int m^{\frac{1}{1-\nu}} d\psi_m\right)^{1-\nu} \left(K^\theta L^{1-\theta}\right)^\nu$$

The magnitude of resource misallocation is defined as the gap between the equilibrium output and the optimal output, as expressed below:

$$ML(I) = \log Y_{Eq}(I) - \log Y^*\left(\psi_m(I), L(I), K(I)\right)$$

$Y_{Eq}(I)$ is the equilibrium output under the institution I, and $ML(I)$ is the magnitude of resource misallocation under the institution I.

Therefore, the contribution of improved resource allocation, as shown in Figure 5.3 of the main text, is defined as the difference in the magnitude of resource misallocation under each respective SME subsidy policy.

$$MLC(I_1, I_2) = ML(I_1) - ML(I_2)$$

$MLC(I_1, I_2)$ represents the contribution of improved resource allocation between the equilibrium output under the institution I_1 and I_2

(2) Contribution of Changes in Aggregate Capital Stock

The contribution of changes in aggregate capital stock is defined as follows:

$$CSC(I_1, I_2) = log\, Y^*(\overline{\psi_m}, \bar{L}, K(I_1)) - log\, Y^*(\overline{\psi_m}, \bar{L}, K(I_2))$$

This represents the change in optimal output under the equilibrium of each institution.

(3) Contribution of Firm Entry/Exit

The contribution of Firm Entry/Exit is defined as follows:

$$FEC(I_1, I_2) = log\, Y^*(\psi_m(I_1), L(I_1), \bar{K}) - log\, Y^*(\psi_m(I_2), L(I_2), \bar{K})$$

In other words, assuming that the aggregate capital stock is fixed under each institution, this represents the contribution of the change in optimal output caused by shifts in the distribution of entrepreneurs and workers across households in equilibrium. Since the distribution of innate abilities among households is fixed in a steady state, an increase in the number of households choosing to become entrepreneurs leads to a decrease in the labor supply. Consequently, if either too few or too many households choose to be entrepreneurs, total output will decline.

It can be demonstrated that the sum of the three aforementioned contributions matches the total variation in equilibrium output between the institutions, as expressed below:

$$log\, Y_{Eq}(I_1) - log\, Y_{Eq}(I_2) = MLC(I_1, I_2) + FEC(I_1, I_2) + CSC(I_1, I_2)$$

(4) Contribution of "Peter Pan Syndrome"

While the change in total output resulting from the policy shift can be decomposed such that the sum of the contributions equals the total variation, it is difficult to

precisely isolate the effect of the Peter Pan syndrome through this approach alone. To fully isolate the effect of the Peter Pan syndrome, it is necessary to estimate **the resource misallocation specifically caused by firms that under-produce due to the constraints of the SME subsidy criteria**.

However, isolating this effect is challenging for two reasons. First, since ① all firms deviate from their optimal output levels, and an increase in inputs for one firm decreases the input of other firms, the effect varies depending on which firms the resources are reallocated from. Second, ② SME support systems influence the dynamic decisions of firms, affecting not only those at the eligibility threshold but also firms around the threshold[44].

In this report, the effect of the Peter Pan syndrome arising from changes in dynamic decisions is captured by focusing solely on the reduction in firm growth rates near the threshold. Accordingly, the quantitative magnitude of resource misallocation caused by the 'Peter Pan syndrome' is estimated by targeting only those firms constrained at the subsidy threshold in the steady state. Specifically, the change in output within the economy when an individual firm grows into a large-scale firm is calculated using the following equation:

$$SM(a,e) = y_{big}(a,e) - y_{small}(a,e) - w^* \left(l_{big}(a,e) - l_{small}(a,e) \right) - (r+\delta) * (k_{big}(a,e) - k_{small}(a,e))$$

Here, $y_{size}, k_{size}, l_{size}(size = big\ or\ small)$ represent the output, capital input, and labor input, respectively, when a given entrepreneur operates as a large-scale firm or an SME. Thus, the equation above subtracts the market price of the additional factor inputs from the increase in output that occurs when the entrepreneur grows from an SME to a large-scale firm[45].

Finally, the reduction in output from the Peter Pan syndrome is defined as follows:

$$PeterpanLoss = \int SM(a,e) * I_{y_{small}(a,e)=T} d\psi_{small}$$

[44] When an entrepreneur chooses not to exceed the SME threshold near the boundary, they cease to expand production even as their assets increase. Consequently, the marginal productivity of additional assets drops sharply, which in turn disincentivizes asset accumulation among entrepreneurs near the SME threshold.

[45] If a firm procures additional factors of production from the market, it must pay the prevailing market price. The market price equals the marginal productivity of factors in large firms that are not bound by financial constraints. Thus, the equation above represents the effect on total output when resources are reallocated from unconstrained large firms to the firms positioned at the SME threshold. Since firms facing financial constraints do not adjust their input levels in response to minor changes in the real interest rate, any increase in factor inputs by firms at the SME threshold would actually be sourced from unconstrained firms.

BOX 9 A Heterogeneous-Firm Model for Analyzing the Effects of Improved Restructuring Efficiency

The basic production structure of the model is identical to the heterogeneous firm model described in BOX 6. However, to analyze the impact on economic output when the government facilitates a smoother structural adjustment, we have introduced capital adjustment costs into the model.

(1) Firm

By assuming that adjustment costs are incurred when a firm reduces its capital[46], this model can incorporate the situation that firms experience persistent deficits. Specifically, the functional form of the adjustment cost is as follows:

$$\psi(k,k') = p_s(k-k')\left(\frac{k-k'}{k}\right)^{0.5} I(k' \le k)$$

In other words, the capital adjustment cost increases when a larger amount of capital is adjusted at once. Furthermore, the cost is incurred only in situations where firms decrease the capital—that is, when the capital stock for the next period is less than the capital stock of the current period.

However, the introduction of adjustment costs requires the capital stock to be included as a state variable in order to solve the firm's optimization problem, which significantly increases the computational burden. Accordingly, elements such as firm life cycles, entry and exit, and SME classification—as illustrated in Box 6—are all excluded from the model.

The firm's optimization problem is as follows:

$$v^f(a,k,e,\epsilon) = \max_{c,a'\ge 0,\lambda\phi a'\ge k'\ge 0} u_f(c) + \beta E[v^f(a',k',e',\epsilon')|e]$$
$$s.t.\quad c + a' - k' + \psi\big((1-\delta)k,k'\big) = (1+r-\mu)(a-k) + (1-\delta)k + Y^*(e,\epsilon,k) - wl^*(e,\epsilon,k)$$
$$Y(e,\epsilon,k,l) = exp(e+\epsilon+S)\left(k^\theta l^{1-\theta}\right)^\nu$$

Unlike the production structure in BOX 6, in each period, a firm determines its optimal output (Y^*) based on the capital stock decided in the previous period, and must pay an

[46] If a firm can adjust its factor inputs without friction, it would not incur losses under a production function with diminishing marginal returns, as it could simply reduce its input levels.

adjustment cost if it chooses to reduce its capital relative to the previous period. As in BOX 6, the amount of capital a firm can determine in each period is constrained by its net asset size a, and it is assumed that each entrepreneur allocates a certain proportion (ϕ) of their own assets as firm assets, with the remainder held as personal assets[47].

Unlike the model in BOX 6, this model introduces an additional transitory productivity shock ϵ. This is intended to replicate the proportion of firms with an interest coverage ratio (ICR) of less than one and the proportion of zombie firms within the model[48]. Furthermore, since this model lacks entry and exit, a fixed ability shifter S is introduced to maintain consistency with the occupational choice between entrepreneurs and workers in BOX 6; this ensures that the productivity of entrepreneurs is systematically higher than that of workers.

In this model, productivity shocks and capital adjustment costs can lead to instances where firms are unable to meet their debt obligations. The resulting amount of unpaid debt is set to be reflected in the interest rate spread μ.

(2) Household

Households determine their savings based on the following standard Aiyagari model:

$$v^h(a,e) = \max_{c,a' \geq 0} u_h(c) + \beta E[v^h(a',e')|e]$$
$$s.t. \quad c + a' = (1 + r - \mu)a + w * exp(e)$$

The model reflects that the return on assets decreases by the average interest rate spread μ due to firm defaults.

(3) Evaluating the Effect of Efficient Structural Adjustment

The objective is to analyze how a reduction in capital adjustment costs (p_s) influences the efficient reallocation of resources and the investment behavior of firms. When p_s decreases, output increases primarily through two key channels.

① As a direct channel, the presence of capital adjustment costs slows down the speed

[47] Unlike the model in BOX 6, this model allows for cases where firms fail to repay their debts under negative productivity shocks. In such instances, to prevent the firm from going bankrupt and consumption converging to zero, limited liability is introduced as a stabilizing mechanism.

[48] When a firm is hit by a negative persistent shock, the presence of capital adjustment costs causes it to experience a prolonged period of deficits or maintain operating profits lower than interest expenses. In contrast, under a transitory shock, the firm experiences only a temporary deficit.

at which production factors are reallocated to other firms when an entrepreneur experiences persistent negative productivity shocks. Consequently, such firms end up employing excessive levels of production factors relative to their productivity. Therefore, higher capital adjustment costs lead to lower efficiency in resource allocation within the economy.

② As an indirect channel, the presence of capital adjustment costs exposes firms to greater risk as their investment scale increases. That is, if an entrepreneur is even slightly risk-averse, they will reduce their overall investment because they cannot recover their asset if a negative productivity shock occurs after an aggressive investment. Accordingly, as capital adjustment costs decrease, investments become more recoverable, leading to an increase in overall investment

(4) Calibration

The parameters of the model are calibrated to match the following statistics. In particular, the standard deviation of transitory shocks (σ_ϵ) and the capital adjustment cost (p_s) are set to replicate the overall proportion of firms with an interest coverage ratio (ICR) of less than one, as well as the share of zombie firms.

[Table 1] Parameters and Target Moments

Parameters	Value	Target Moments
ρ (Persistency of Productivity)	0.97	Firm Production Gini and the share of zombie firms
σ (Productivity Std. Dev)	0.08	Firm Production Gini and the share of zombie firms
σ_ϵ (Transitory shock Std. Dev)	0.3	Proportion of firms with an ICR of less than 1[49]=0.463
λ (Maximum Leverage)	5	Identical to BOX 7, conventional level
ν (Span of Control)	0.85	Identical to BOX 7, conventional level
θ (Cobb-Douglas Parameter)	0.3	Identical to BOX 7, labor income share (wage / production) = 0.6
δ (Depreciation Rate)	0.066	Identical to BOX 7, conventional level
β (Discount Factor)	0.96	Market Interest Rate = 2%
σ_f (Firm relative risk aversion)	0.2	Lowest empirical estimate of firm risk aversion
σ_h (Household relative risk aversion)	1.4	Equity-to-Asset Ratio =45.2%
S (Productivity Shifter)	1.34	Entrepreneur Threshold in BOX 7
p_s (Capital Adjustment Cost)	0.2	Firms with ICR of less than 1 for 3 consecutive years=0.132

[49] $Y - wl - \delta k - \psi((1-\delta)k, k')) < (r + 0.02)k$, while the model utilizes the real interest rate, the interest coverage ratio (ICR) in practice is evaluated based on the nominal interest rate. To account for this discrepancy, an inflation rate of 2% was added.

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