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Causes of the Structural Decline in Korea's Economic Growth Following Economic Crises : Focusing on Corporate Investment Channels

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1. Since the 1990s, **Korea's economic growth** has experienced a **structural slowdown**, failing to return to its pre-crisis trend after **undergoing a series of economic crises**. An analysis based on macroeconomic data suggests that this resulted from **negative demand shocks** triggered by the said crises, which led to a **persistent slowdown in the growth trend** through **investment hysteresis**.*

* Hysteresis refers to a phenomenon in which a temporary shock has a negative effect on the long-run trajectory of economic variables (e.g., unemployment, investment).

2. To identify the causes of this investment hysteresis and explore possible solutions, an empirical analysis is conducted with firm-level microdata. An analysis of approximately 2,200 externally audited firms shows that, except for a small number of large corporations, investment among most firms stagnated or declined after the Global Financial Crisis. Furthermore, this **weakness in investment** appears to be more closely associated with **deteriorating profitability than with tightening financial constraints**.

3. Given the greater impact of deteriorating profitability on the post-crisis weakness in corporate investment than financial constraints, financial support alone may be insufficient to mitigate hysteresis. Instead, it is necessary to ensure on a fundamental level that the **cleansing mechanism (cleansing effect)** functions properly to allow the **market exit of zombie firms**, while also facilitating the **smooth entry of new firms,** so as to **enhance the dynamism** of the economy.

4. What would Korea's investment and growth have been **if the cleansing mechanism had functioned effectively**? Using the characteristics of firms that actually exited the market, this paper identifies **firms at high risk of exit** and estimates that they accounted for **3.8 percent** of the total sample **between 2014 and 2019**. In contrast, the **actual exit rate** was only **2.0 percent**, roughly half the estimated share of high-exit-risk firms, indicating that the cleansing effect appears to have been limited during this period. Had these high-exit-risk firms exited the market and been replaced

by viable firms within the industry, **domestic investment** would have been **3.3 percent higher** and **GDP 0.5 percent higher** over the same period. During the **post-pandemic period (2022–2024)**, the share of high-risk firms (3.8 percent) remained similar to that of the earlier period, but the **actual exit rate** fell further to **0.4 percent**. If these firms had been replaced successfully, **investment** is estimated to have increased by **2.8 percent** and **GDP** by **0.4 percent**.

5. In sum, the **post-crisis slowdown in Korea's economic growth** stems primarily from **weak investment driven by declining corporate profitability**. This slowdown appears to have been further exacerbated by the impairment of the economy's cleansing mechanism, which, had it functioned effectively, could have mitigated such weakness. To mitigate and ultimately reverse the decline in the growth trend, it is essential that policy efforts prioritize the following: (1) Even when **financial support** is provided, it should be designed to **underpin** the economy's **innovativeness** and **dynamism** by ensuring the **smooth entry** and **exit** of firms. For example, financial support should seek to **enhance its effectiveness** by being **selective and supplementary** in its application, targeting firms facing temporary liquidity difficulties or innovative early-stage firms. (2) In addition, while maintaining Korea's technological advantage in key industries, it is important to **strengthen** the **future growth engines** of the Korean economy by **stimulating investment** in **new industries** through **regulatory easing to create new demand for products and services**.

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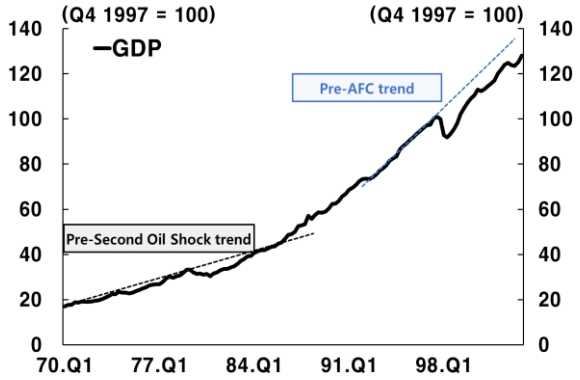
I. Background

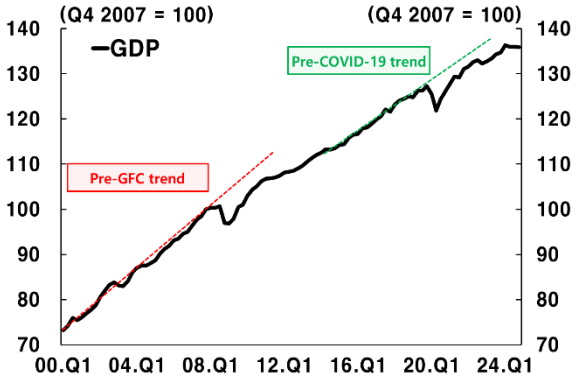
1. Since the 1990s, Korea's economic growth has exhibited a trend of structural slowdown as the economy has passed through a series of economic crises. Following the 1997 Asian Financial Crisis (AFC), the 2008 Global Financial Crisis (GFC), and the 2020 pandemic, the economic growth rate has declined step by step with each crisis episode. This structural growth slowdown stands in clear contrast to the period after the oil shocks of the 1970s, when growth underwent a sharp decline but nevertheless rebounded to levels surpassing its previous trend (see **Figures 1 and 2**).

Korea's economic growth trend: structural slowdown after successive crises

[Figure 1] Pre-2000 GDP



[Figure 2] Post-2000 GDP



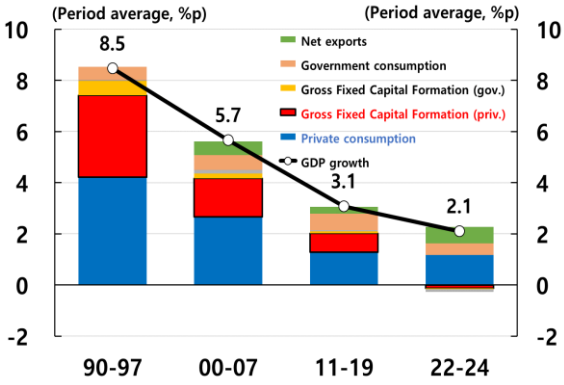
Source: Bank of Korea

2. The structural deceleration of Korea's growth trend since the 1990s has been driven primarily by **a slowdown in private consumption and private investment** (see **Figure 3 and Table 1**)**.** The deceleration in **private consumption** reflects Korea's transition into a more mature stage of economic development, combined with demographic shifts—particularly population aging—as well as the accumulation of household debt. In terms of **private investment**, however, as discussed later, the impairment of the cleansing effect[1] during crisis periods, including the delayed exit of zombie firms, appears to have resulted in hysteresis[2] due to the prolonged slump in corporate dynamism. Indeed, during the Global Financial Crisis, both Korea and the United States experienced a sharp decline in the entry rate (startup rate) of new firms. However, the exit rate (closure rate) of existing firms showed contrasting patterns between the two countries: In the U.S., the exit rate rose as expected during the crisis, whereas in Korea it did not and furthermore actually saw a decline during the pandemic (see **Figures 4 and 5**).[3]

[1] The cleansing effect refers to the mechanism through which low-productivity firms exit the market during economic downturns, allowing resources to be reallocated more efficiently and thereby improving the productivity of the economy as a whole.
[2] Hysteresis refers to a phenomenon in which a temporary shock has a negative effect on the long-run trajectory of economic variables (e.g., unemployment, investment).
[3] In the U.S., the startup rate increased during the pandemic, which is analyzed to be attributable to factors such as the expansion of digital platform–based business models (Haltiwanger, 2022).

Growth trend slowdown due to weak private consumption and investment

[Figure 3] Growth Contribution by Expenditure Component



[Table 1] Changes in Growth Contribution by GDP Component before and after Major Crises

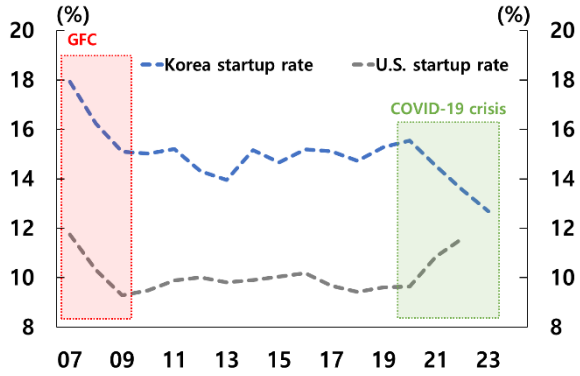
(Annual average, %p)

	Growth rate↓	Priv. Cons	Priv. Inv.	Gov.	Net Exp.
Pre/Post-AFC (1990–97→2000–07)	**-2.8**	**-1.6**	**-1.7**	-0.3	0.5
Pre/Post-GFC (2000–07→2011–19)	**-2.6**	**-1.4**	**-0.8**	0.0	-0.3
Pre/Post-pandemic (2011–19→2022–24)	**-1.0**	**-0.1**	**-0.9**	-0.3	0.4

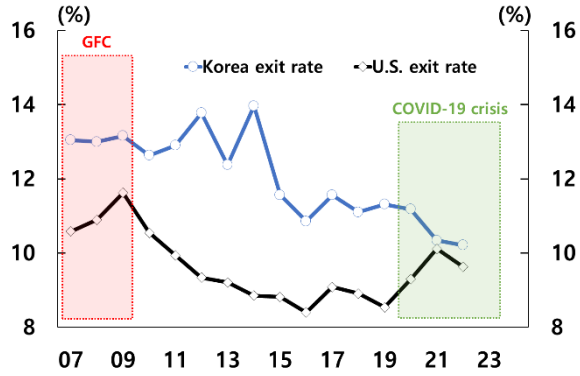
Source: Bank of Korea.

Exit of zombie firms in Korea potentially delayed during crises due to financial support

[Figure 4] Firm Startup Rate



[Figure 5] Firm Exit Rate



Sources: Bank of Korea, Ministry of Data and Statistics, and U.S. Business Dynamics Statistics (BDS).

3. Against this backdrop, this paper empirically examines the causes of the structural slowdown in Korea's growth trend, with particular attention to corporate investment channels following economic crises. Chapter II uses macrodata to analyze the phenomenon of investment hysteresis before and after major crises as a factor contributing to the decline in the growth trend. Chapter III investigates the factors behind the structural weakening of corporate investment using firm-level microdata[4] and **identifies high-exit-risk firms to estimate the impact of the insufficient cleansing effect on growth.** Lastly, Chapter IV draws on these analytical findings to explore policy directions aimed at reversing the structural slowdown in growth, specifically the need to restore the cleansing mechanism by enhancing corporate dynamism, as well as strategies to strengthen the economy's growth potential.

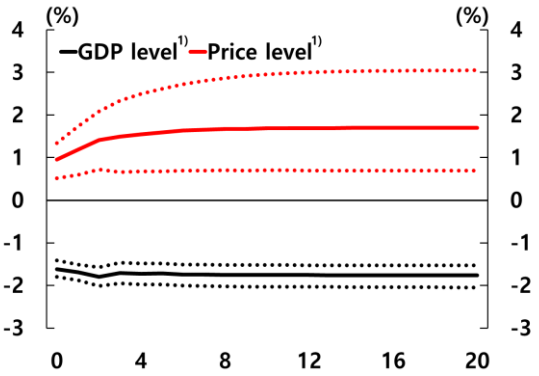
[4] While drawing on traditional economics discourse—particularly the existing literature on economic growth—this paper conducts its analysis by focusing on tangible equipment investment, while also taking into account investment in intellectual property products in light of the rising importance of intangible assets in the economy.

II. Macroeconomic Analysis (Stylized Facts)

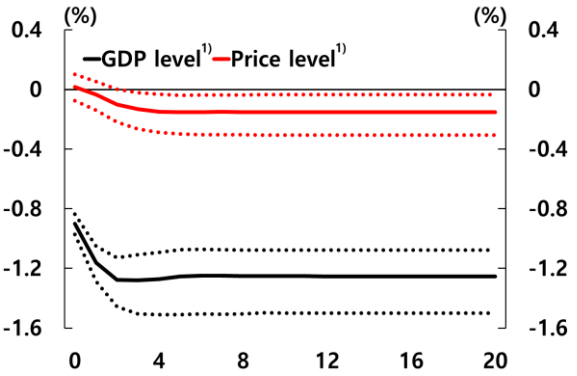
4. First of all, using the Blanchard and Quah (1989) methodology[5] to analyze **Korea's growth drivers across different periods, this paper finds that whereas economic growth was largely led by supply factors before the Asian Financial Crisis** (see **Figure 6**), **after the crisis, demand factors have come to play a major role and since accounted for a substantial share of the changes in the GDP trend** (see **Figure 7**). This finding is consistent with the earlier discussion that the slowdown in the growth trend since the 1990s has been largely attributable to weakened private consumption and investment following successive economic crises. Under traditional macroeconomic theory, long-run growth trends are influenced by supply shocks, while demand shocks affect only cyclical fluctuations.[6] However, recent studies utilizing endogenous growth models since the Global Financial Crisis have theoretically shown that demand shocks can influence long-term growth through effects such as reduced R&D investment.[7]

Growth drivers: supply-led before the Asian Financial Crisis, demand-led thereafter

[Figure 6] Pre-AFC (Jan. 1968–Apr. 1997): Supply-led



[Figure 7] Post-AFC (Jan. 1998–Apr. 2024): Demand-led



Note: 1) The dotted lines indicate the 68% confidence interval; GDP is measured on a per-capita basis.
Source: Authors' estimations.

5. Given the demand-driven growth since the Asian Financial Crisis, the analysis indicates that it is not temporary demand factors but rather "permanent" demand shocks that have

[5] Blanchard and Quah (1989) identified shocks that have a permanent effect on the GDP trend by imposing long-run restrictions, interpreting the subsequent price and GDP responses to these shocks to classify them as demand factors when the two variables move in the same direction, and as supply factors when they move in opposite directions.

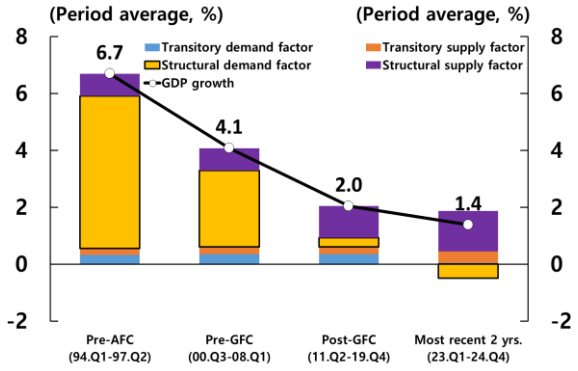
[6] Since Solow's growth model (1956) and Friedman's natural rate hypothesis (1968), the conventional view in macroeconomics has held that the long-run growth path is determined by supply factors, where demand influences only short-run fluctuations. Blanchard and Quah (1989) incorporated this theoretical premise into their empirical framework by imposing long-run restrictions.

[7] Several studies conducted after the Global Financial Crisis have combined endogenous growth mechanisms with New Keynesian models, showing that a contraction in demand leads to lower investment, which can in turn depress productivity and exert lasting effects on long-run growth (Benigno & Fornaro, 2018; Moran & Queralto, 2018; Guerron-Quintana & Jinnai, 2019, among others).

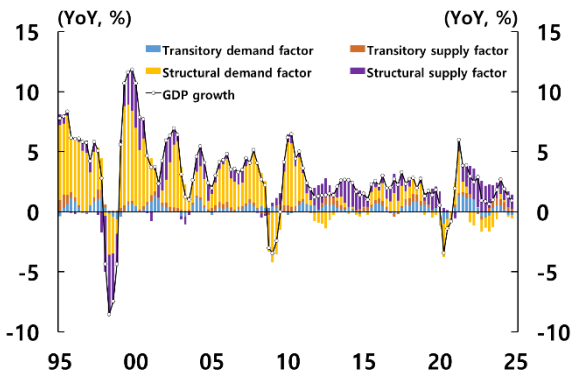
contributed to the slowdown in the growth trend (see **Figures 8 and 9**)**.** Using the methodology of Furlanetto et al. (2025),[8] this paper decomposes per capita GDP growth into structural and transitory demand and supply factors. The contribution of the structural demand factor (permanent demand shocks) to growth declined from 5.4 percent before the Asian Financial Crisis, to 2.7 percent before the Global Financial Crisis, and further to 0.3 percent thereafter. In the most recent two years, the contribution even turned negative at -0.5 percent, indicating that the structural demand factor (permanent demand shocks) has actually hindered growth (see **Figures 8 and 9**). In contrast, the contribution of the structural supply factor (permanent supply shocks) increased after the 2010s, supported by rising employment rates driven by greater labor-force participation among women and older workers. However, its expansion has been insufficient to offset the structural demand weakness. Meanwhile, the transitory demand and supply factors (transitory demand and supply shocks) are found to affect only short-run cyclical fluctuations.

Structural demand weakness as the main driver of growth trend slowdown after the Asian Financial Crisis

[Figure 8] Contribution of Factors before and after Major Crises[1)]



[Figure 9] Contribution of Each Factor to Per-capita GDP Growth



Note: 1) The end points for the pre-Asian Financial Crisis and pre-Global Financial Crisis periods are set to four quarters before the trough of GDP growth during each crisis.

Source: Authors' estimations.

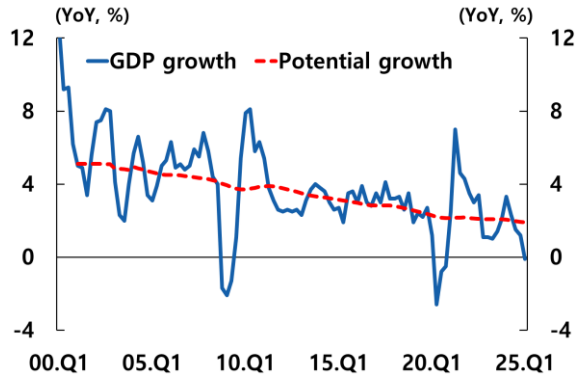
6. The structural weakness in demand is assessed to have slowed the growth trend primarily through the investment channel. Growth accounting analysis indicates that the deceleration of the growth rate before and after economic crises is largely attributable to a decline in the contributions of total factor productivity (TFP) and capital formation (see **Figures 10 and 11**). Given that capital

[8] To control for demographic dynamics, the analysis is conducted on a per-capita basis. Following the methodology of Furlanetto et al. (2025), the analysis constructs a four-variable Structural Vector Autoregressive (SVAR) model (per-capita GDP growth, inflation, employment rate, and per-capita equipment investment growth), to which long-run restrictions are applied to identify structural shocks that exert permanent effects on the trends of the variables, as well as transitory shocks that affect only short-run fluctuations. Using sign restrictions, shocks are then classified as demand shocks when prices and GDP respond in the same direction, and as supply shocks when they respond in opposite directions, allowing for the identification of four factors: permanent demand shocks, permanent supply shocks, transitory demand shocks, and transitory supply shocks.

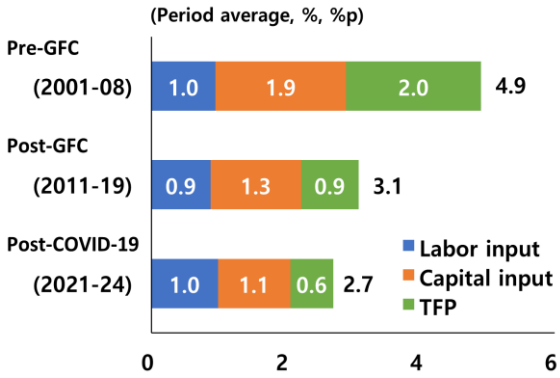
and productivity are production factors closely linked to investment, the diminished contributions of these two factors to growth can be interpreted to reflect a quantitative contraction in investment. Moreover, considering Korea's high investment rate compared with major advanced economies, the decline in TFP's contribution suggests that the quality of investment may also have deteriorated.[9] Such importance of investment channel is further confirmed by the counterfactual analysis presented below.

Growth trend slowdown before and after crises mainly due to weak productivity and capital formation, both of which are closely related to investment

[Figure 10] Trends in GDP Growth and Potential Growth



[Figure 11] Contributions to GDP Growth by Factor[1)]



Note: 1) Labor input is measured using the number of employed persons, and capital input is based on fixed assets. The labor income share is set at the most recent 10-year average of 0.65, and contributions to TFP are derived using a Cobb–Douglas production function.

Sources: Bank of Korea, authors' estimations.

7. Under the counterfactual that economic crises had not induced structural demand weakness, Korea's investment and GDP would likely have returned to their pre-crisis trend to a sufficient degree (see **Figures 12 and 13**).[10] In reality, however, both investment and GDP remained subdued at a low level for a significant period in the aftermath of major crises. This indicates the impact of an economic mechanism in which negative demand shocks trigger a vicious cycle—investment contraction leads to a slowdown in demand, and vice versa—resulting in investment hysteresis and ultimately preventing economic growth from reverting to its pre-crisis trend.[11] As a result, it led to

[9] Korea's investment rate (investment in equipment and intellectual property products as a share of GDP) has remained persistently high since the 2000s. The average investment rate from 2000 to 2023 was 15.4 percent, exceeding the OECD average (approximately 11.0 percent) by more than 4 percentage points and surpassing those of major advanced economies such as Japan (13.4 percent), the U.S. (12.1 percent), Germany (10.4 percent), and the United Kingdom (7.8 percent).

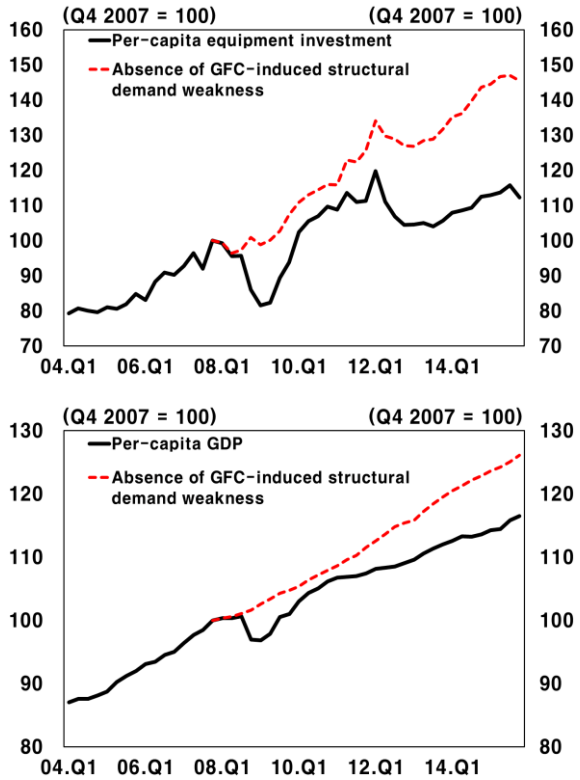
[10] A counterfactual scenario is constructed assuming the absence of permanent demand shocks identified through the SVAR model based on Furlanetto et al. (2025). Specifically, the counterfactual paths of per-capita investment and per-capita GDP are derived by excluding only the permanent demand shocks from the four identified shocks (permanent demand shocks, permanent supply shocks, transitory demand shocks, and transitory supply shocks). The effects of post-crisis structural demand weakness on the economy are quantified by comparing these counterfactual paths with the actual trajectories.

[11] The SVAR model employed in this study alone may be inadequate to identify clear causality regarding

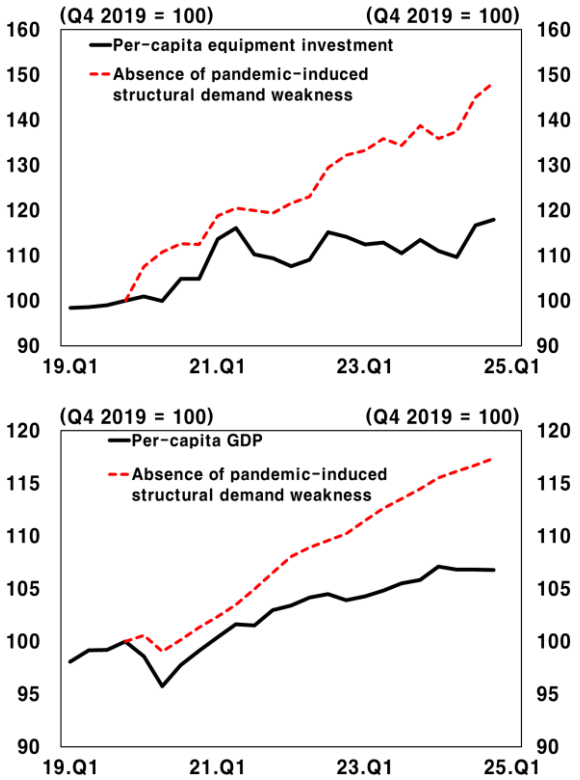
a slowdown in capital accumulation and subdued productivity improvements, ultimately causing a persistent deceleration in Korea's growth trend following each economic crisis.

Crisis-induced structural demand weakness leading to the inability of investment and GDP growth to return to their pre-crisis trend, ultimately causing their persistent decline

[Figure 12] Per-capita Investment and Per-capita GDP before and after the GFC (Actual vs. Counterfactual: Absence of Structural Demand Weakness)



[Figure 13] Per-capita Investment and Per-capita GDP before and after the COVID-19 Pandemic (Actual vs. Counterfactual: Absence of Structural Demand Weakness)



Source: Authors' estimations.

whether investment contraction caused or exacerbated structural demand weakness. However, the prior studies in Footnote 7 suggest that a decline in investment can further slow aggregate demand through the subsequent deterioration in productivity. Furthermore, the results of the growth accounting analysis in Paragraph 6 also indicate that the growth deceleration before and after economic crises is primarily attributable to TFP and capital formation, both of which are closely related to investment. Therefore, this study concludes that these research results and findings substantiate the mechanism of structural demand weakness led by investment contraction.

III. Micro-level Analysis Using Firm Data

Factors behind the Structural Slowdown in Corporate Investment

8. This section conducts a firm-level analysis to identify investment hysteresis and its underlying determinants as established through macroeconomic analysis. The findings reveal that individual corporate investment has largely slowed down or remained stagnant across the majority of enterprises, with the exception of a few large-scale firms. An examination of the annual distribution of investment (increases in tangible and intangible assets, plus R&D expenses)[12] across externally audited firms[13] between 2000 and 2024 shows that the top 0.1 percent of firms maintain investment at the pre-crisis trend before and after 2011. Furthermore, the firm with the largest investment scale accounts for nearly one-third of the aggregate investment in the sample alone, underscoring that aggregate investment dynamics are largely dictated by the investments of a small number of firms. In contrast, the investment levels of other percentiles, e.g. the top 30th percentile, 50th percentile, and 70th percentile, have either stagnated or declined since 2011 (see **Figure 14**).[14] According to an analysis of the distribution of investment growth rates across individual firms, nearly half (48 percent) of firms registered a negative growth rate in investment between the 2011–2013 average and the 2014–2019 average.[15] Furthermore, approximately 7 percent of the firms experienced a severe investment decline of 80 percent or more (see **Figure 15**). Meanwhile, the aggregate investment in the sample increased by 22 percent during the said periods, and the contribution of diminished-investment firms shows a significant impact at -13 percentage points.

[12] Given the increased importance of intangible assets alongside tangible assets driven by shifts in industrial structure, investment is defined as the sum of increases in tangible and intangible assets, plus R&D expenses.

[13] A balanced panel is used to analyze changes at the firm level while abstracting from entry and exit effects. In addition, externally audited firms with a business history of at least 10 years are included in the sample to exclude early-stage firms. The scope of industries in the sample encompasses all industrial sectors other than agriculture, financial and insurance services, electricity, gas, and water supply, public administration, and defense. Considering the changes in the accounting system following the Asian Financial Crisis (Lee & Kim, 2003) and the fact that extending the sample further back in time reduces the number of firms that meet the requirements for a balanced sample, this study uses data starting from the year 2000. The sample is restricted to externally audited firms to ensure a long-term time series, thereby limiting its reflection of the investment behavior of non-externally audited firms. Nevertheless, the correlation of approximately 0.6 between the aggregate investment growth rate in the sample and the investment growth rate in the national accounts indicates broadly consistent movements. Future research may be able to address this limitation once a long-term sample that includes non-externally audited firms becomes available.

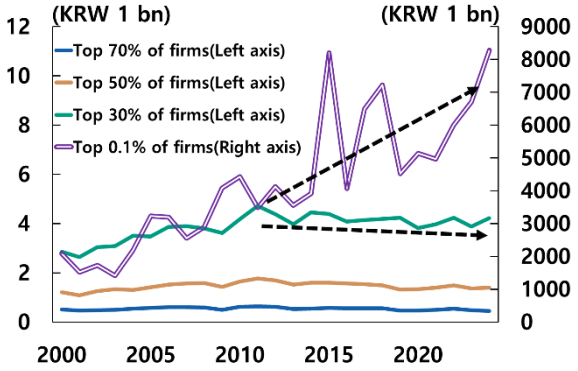
[14] This is a nominal variable that does not reflect the inflation rate; when converted to real terms, the decline becomes even steeper.

[15] To exclude volatility associated with significant events such as the Global Financial Crisis and the COVID-19 pandemic, this study focuses on the distinct periods of 2011–2013 and 2014–2019. It then compares the averages of the two periods since individual firms often invest in a lumpy manner, and therefore comparing investments at set points in time may distort the underlying trend.

Divergence in corporate investment between a few large firms maintaining their pre-crisis trend and most firms experiencing stagnation or slowdown

Decline in investment in nearly half of firms

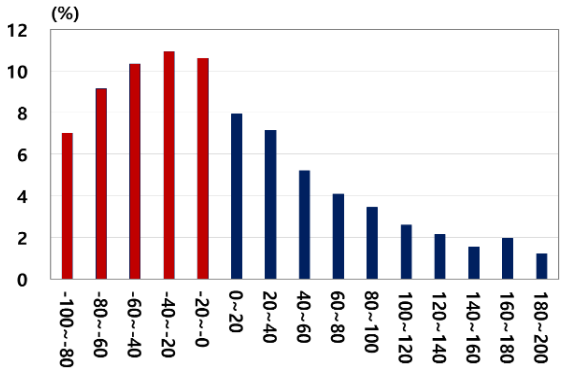
[Figure 14] Trends in Investment[1] Distribution[2]



Notes: 1) The sum of increases of tangible and intangible assets, plus R&D expenses.
2) The distribution of investment amounts for each year.

Sources: Valuesearch, authors' calculations.

[Figure 15] Distribution of Investment[1] Growth Rates[2] of Individual Firms



Notes: 1) The sum of increases of tangible and intangible assets, plus R&D expenses.
2) The percentage change from the 2011–2013 average investment to the 2014–2019 average investment of individual firms.

Sources: Valuesearch, authors' calculations.

9. The analysis of the determinants behind the corporate investment slowdown reveals that diminished investment by individual firms is primarily attributable to weak profitability rather than the effects of financial constraints. According to existing research, corporate investment decisions are predominantly affected by profitability and financial constraints ~~(collateral and liquidity constraints)~~. Firms tend to increase investment to generate greater profit when higher future profitability is anticipated. However, despite these investment intentions, financial constraints, such as collateral and liquidity constraints, may hinder their investment.[16] In light of this, this study examines the relationships between the change in investment and firm-level factors, such as operating profit, debt, and liquidity, across externally audited firms before and after the Global Financial Crisis.[17] The dependent variable is the

[16] Neoclassical investment theory predicts that firms with higher future profitability will increase investment as part of their profit-maximization process. Tobin's Q theory likewise predicts that firms will expand investment when their market value, which incorporates future profits, exceeds replacement costs. However, Blanchard et al. (1993) analyze that it is actually firms' fundamentals(e.g. profits), rather than market valuation, that play a more important role in investment. Meanwhile, Fazzari et al. (1988) argue that internal cash flow is key to investment for firms facing constraints on external borrowing. Almeida and Campello (2007) further demonstrate that collateral can affect investment by determining firms' ability to obtain external funding. Khan and Thomas (2013), Ottonello and Winberry (2020), and Jeenas (2023) examine how factors such as collateral and liquidity constraints affect corporate investment and the business cycle.

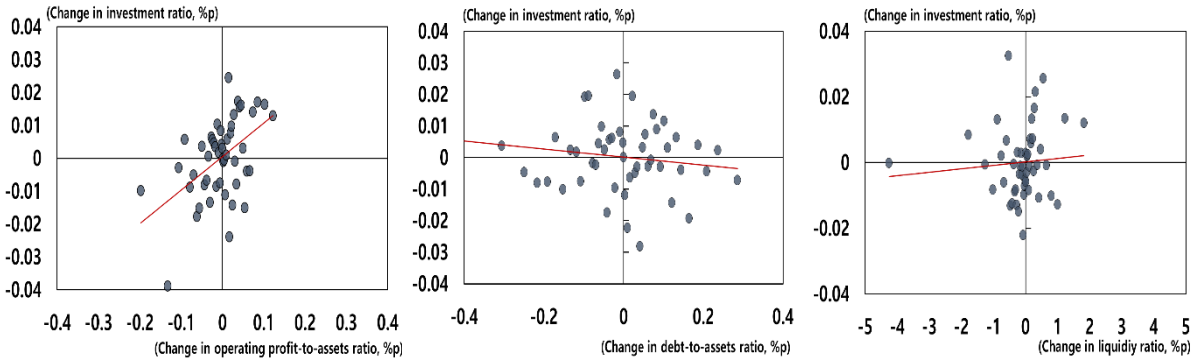
[17] The conventional measure of return on assets (ROA), defined as net profit divided by total assets, includes non-operating profit. This study, therefore, uses operating profit to examine a firm's profitability from core business operations. The findings remain largely unchanged when operating profit is replaced with earnings before interest, taxes, depreciation, and amortization (EBITDA), a metric widely used in the literature.

change in the investment ratio (investment divided by assets), while the key explanatory variables include the change in the operating return on assets (OROA, operating profit divided by assets); the change in the debt ratio (debt divided by assets); and the change in the liquidity ratio (cash plus short-term investment assets, divided by current liabilities).[18][19] The results of regression analysis indicate that the change in the investment ratio is most closely linked to the change in operating profit (see **Figure 16**), and that a 1-percentage-point increase in the OROA leads to an increase of 0.07 to 0.09 percentage points in the investment ratio before and after the Global Financial Crisis (see **Table 2**). The significant effect of the change in profitability on investment remains largely unchanged, even after controlling for industry dummies, asset size, and sales growth rate. Meanwhile, the change in the debt ratio or liquidity ratio does not exhibit a significant relationship with the change in investment, suggesting that investment weakness is unlikely to have been driven by shifts in financial constraints.

Shifts in corporate investment driven by changes in firms' profitability

[Figure 16] Relationship between Changes in Corporate Investment[1)] and Changes in Investment Determinants before and after the GFC[2)]

<OROA> **<Debt Ratio>** **<Liquidity Ratio[3)]>**



Notes: 1) Increases in tangible and intangible assets plus R&D expenses, divided by assets.

2) A residualized binscatter plot with 50 bins.

3) Cash equivalents plus short-term investment assets, divided by current liabilities.

Sources: Valuesearch, authors' estimations.

[18] The investment, operating profit, and debt variables are scaled by total assets to adjust for differences in firm size. The investment ratio, defined as investment divided by assets, serves as an indicator of the pace at which assets increase through investment. For the liquidity ratio, current liabilities due within one year are used as the denominator for assessing short-term cash flow constraints.

[19] The explanatory variables are constructed using the difference between the average for 2005–2007, the three years immediately preceding the Global Financial Crisis, and the average for 2011–2013, the three years immediately following the Global Financial Crisis. In light of the fact that increased investment may result in higher debt or reduced cash equivalents, the dependent variable, defined as the change in the investment ratio, is measured as the difference between the average for 2005–2007 and the average for 2014–2019 (period before the COVID-19 pandemic). To mitigate reverse causality, this study explores the relationship between changes in the variables over 2011–2013 and changes in investment over 2014–2019; however, the deterioration of profitability since 2014 may also have partially contributed to the investment weakness during the said periods.

[Table 2] Regression Analysis of Firm-level Determinants of Investment Deceleration[1)]

[Dependent Variable] Change in Investment Ratio (Investment Divided by Assets)[2)]	(1)	(2)	(3)
Change in Operating Profit-to-Assets Ratio	0.087***	0.075**	0.073**
	(0.028)	(0.031)	(0.032)
Change in Debt-to-Assets Ratio	-0.016	-0.018	-0.016
	(0.011)	(0.012)	(0.012)
Change in Liquid Assets-to-Current Liabilities Ratio	-0.000	-0.000	-0.000
	(0.001)	(0.002)	(0.002)
Log Assets	-	-	-0.004**
			(0.002)
Sales Growth Rate	-	-	-0.011
			(0.017)
Industry Dummies[3)]	X	O	O

Notes: 1) Robust standard errors in parentheses. * : p<0.10, ** : p<0.05, *** : p<0.01.

2) The change in the investment ratio is measured as the difference between the 2014–2019 period and the 2005–2007 period, while the change in each variable is measured as the difference between the 2011-2013 period and the 2005–2007 period. The log assets and sales growth rates are defined with reference to the 2011–2013 period.

3) Based on the class-level classification of the Korean Standard Industrial Classification (KSIC).

Sources: Valuesearch, authors' estimations.

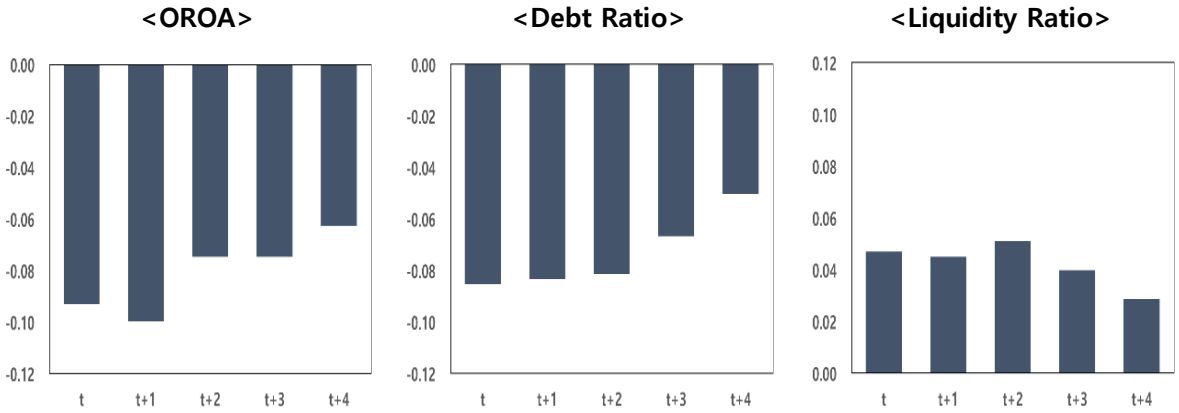
10. These results are also substantiated by the fact that permanent demand shocks identified in Chapter II are closely linked to corporate profitability (see **Figure 17**)**.** According to the regression analysis between permanent demand shocks and the determinants of corporate investment, negative demand shocks lead to an extended period of diminished operating profit, thereby potentially causing weakness in corporate investment by shaping pessimistic expectations about future profits.[20] Meanwhile, negative demand shocks result in a declining debt ratio and an increased liquidity ratio. All else being equal, these effects serve to improve firms' investment capacity and therefore do not sufficiently account for an investment decline driven by permanent demand shocks.[21]

[20] Benigno and Fornaro (2018) argue that a decline in profitability resulting from weak demand can constrain investment in innovation, thus slowing economic growth.

[21] This may be attributed to the following mechanism: permanent demand shocks reduce expectations about future profits, which in turn lowers investment and subsequently results in debt reduction and cash accumulation.

Permanent demand shocks closely linked to corporate profitability

[Figure 17] Relationship Between Negative Permanent Demand Shocks and Key Variables[1)]



Note: 1) Regression coefficients for standardized permanent demand shocks and standardized firm-level factors (OROA, debt ratio, and liquidity ratio).

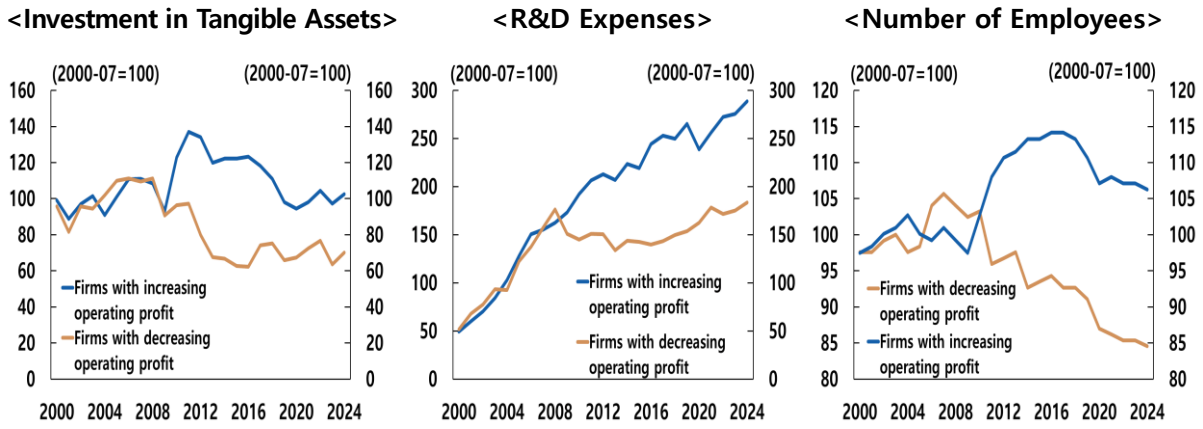
Sources: Valuesearch, authors' estimations.

11. Following the Global Financial Crisis, firms with decreasing operating profit exhibit significantly lower levels of investment than those with increasing operating profit, and the disparity between the two groups has widened over the long term in areas such as R&D and employment (see **Figure 18**)**.** Notably, investment in tangible assets and the number of employees of firms with decreasing operating profit fall below pre-GFC levels, heightening downward pressure on aggregate demand.

12. In summary, permanent demand shocks that emerged due to crises appear to have caused a secular slowdown in investment and growth by weakening corporate profitability. This suggests that improving the profitability of firms' core business operations is essential for restoring investment over the medium to long term. Given that the distribution of operating profit among externally audited firms is shifting downward since the Global Financial Crisis, combined with the pronounced downtrend in operating profit among the bottom decile (see **Figure 19**), it is necessary not only to promote the entry of new firms in high-value-added industries but also to facilitate the orderly exit of firms with extremely low profitability, thereby improving overall corporate profitability.

Persistent weakness in equipment investment, R&D, and employment among firms experiencing a post-crisis decline in operating profit

[Figure 18] Trends in Indicators for Firms with Increasing vs. Decreasing Operating Profit[1)]

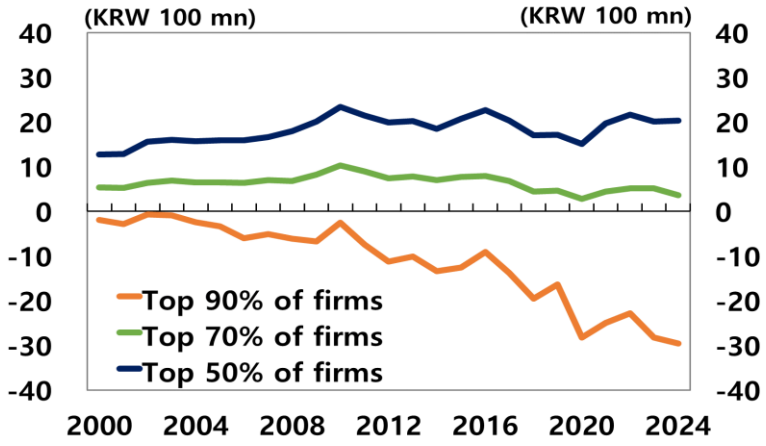


Note: 1) The identification of firms with increasing versus decreasing operating profit is performed by comparing their performance during the pre-crisis period (2005–2007) against the post-crisis period (2011–2013). For each group, the median trends of the variables are presented.

Sources: Valuesearch, authors' calculations.

Widespread post-GFC stagnation and decline in firms' operating profit, marked by a sharper contraction in the bottom decile

[Figure 19] Trends in Distribution of Operating Profit



Sources: Valuesearch, authors' calculations.

Characteristics of Exited Firms and Identification of Exit Risk

13. Unlike in countries such as the U.S., it is likely that the hysteresis in Korea has been more pronounced in the aftermath of crises due to the inadequacy of the cleansing mechanism that would typically force zombie firms to exit the market. The continued survival of these zombie firms may distort market competition and lead to a misallocation of resources, such as capital and labor, toward low-productivity firms. This may hinder the entry and growth of new firms with high productivity, thereby potentially slowing productivity growth in the overall economy.[22] **In the following analysis, this study examines the characteristics of past exited firms and identifies firms at high risk of exit based on these characteristics. Subsequently, this study further estimates the potential effects of increased investment and GDP growth, had the cleansing effect taken effect.**

14. The analysis in this paper uses corporate panel data containing financial information and exit status for approximately 120,000 externally audited and non-externally audited firms. While the data of externally audited firms used earlier in this study has the advantage of securing a long time series, it is not insightful for determining whether firms actually exited the market. The corporate panel data used in this analysis records firms' exit status, making it suitable for analyzing the exit determinants.[23] As with the previous analysis, the sample is limited to firms with a business history of at least 10 years to exclude early-stage growth firms and focus the analysis on zombie firms.

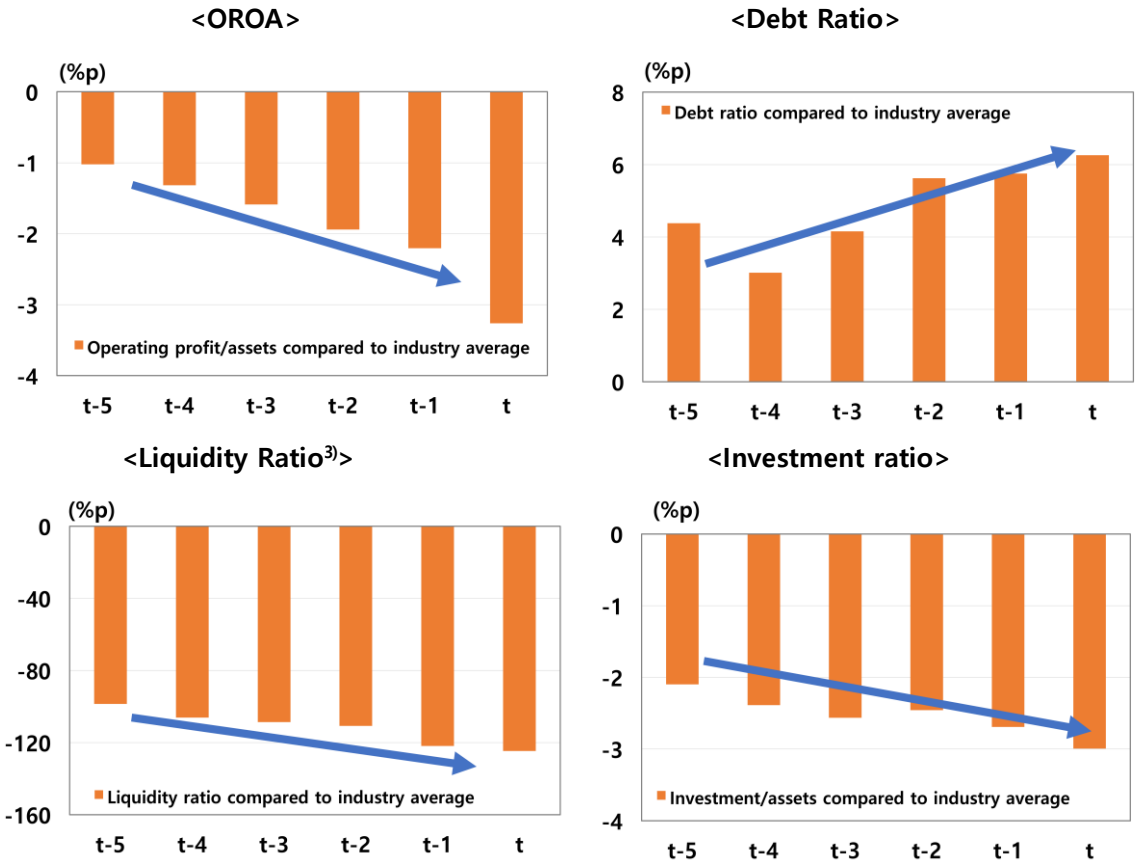
15. The financial characteristics of firms that actually exited indicate that these firms experienced a continuous deterioration in profitability and financial soundness compared to other firms in the industry for several years before exit, along with a corresponding ongoing decline in investment (see **Figure 20**)**.** First, financial soundness indicators such as the debt ratio and liquidity ratio were at poor levels relative to the industry average from several years before exit, continued to worsen thereafter, and eventually led the firms to exit the market. The OROA also fell to a level 3.3 percentage points lower than the industry average at the time of exit, which is substantially low considering the sample average of 4.9 percent. In addition, the investment ratio of exited firms also began to gradually decline from several years before exit, falling to a level of 3.0 percentage points lower than the industry average at the time of exit (compared to the sample average of 4.7 percent).

[22] Lee et al. (2019) also observe a pronounced deceleration in the productivity growth rate among new businesses since the mid- to late 2000s.

[23] A firm is considered to have exited if its records disappear and if it is marked as having ceased operations. In the earlier analysis of externally audited firms, increases in tangible and intangible assets and R&D expenses from the cash flow statement are used; however, in the data that includes non-externally audited firms, changes in tangible assets and R&D expenses from the balance sheet are used to secure sufficient observations. As in the previous analysis, firms in agriculture, financial and insurance services, electricity, gas, and water supply, public administration, and defense are excluded. The sample period spans from 2014 to 2024.

Firms that actually exited did so following deteriorating profitability and financial conditions after gradually downscaling investment

[Figure 20] Financial Conditions and Investment of Exited Firms[1] before Exit[2]



Notes: 1) Differences between average firm characteristics and those of exited firms at the KSIC class level. The median of industry-level results is presented; time t is defined as the last recorded period of operations; and data from the pre-pandemic period (2014–2019) are used.

2) Tangible asset increases plus R&D expenses.

3) Cash equivalents plus short-term investment assets, divided by current liabilities.

Sources: Corporate financial database given by the NICE Credit Information Service, authors' calculations.

16. Based on the financial characteristics of firms that actually exited, this paper estimates the exit probability of individual firms. The analysis period is set from the sample starting point of 2014 to the pre-pandemic year of 2019. A logit model is used as a baseline model for estimating exit probabilities, with the dependent variable defined as whether a firm exited (binary variable: 0 or 1), and explanatory variables including the OROA, debt ratio, and liquidity ratio. This is followed by the addition of interest coverage ratios, which are widely used to identify zombie firms, and the tangible asset growth rate, which reflects investment trends. To address firm heterogeneity according to business age and asset size, these variables are set as control variables, and industry dummies are included to control for industry-level heterogeneity. Meanwhile, to verify robustness, estimations

are also performed using the complementary log-log model[24] as well as the probit model.

17. As expected, the estimation results showed that the lower a firm's profitability and liquidity, and the higher its leverage (debt ratio), the more significantly its exit probability increased (see **Table 3**)**.** In addition, firms that are unable to cover interest expenses with operating profit (interest coverage ratio below 1) show a high exit probability, while growth-related variables such as the tangible asset growth rate and sales growth rate tend to lower the exit probability.[25] All explanatory variables are statistically significant at the 1.0 percent level.

[Table 3] Exit Probability Analysis[1)]

Dependent Variable: Exit Status	(1) logit	(2) cloglog	(3) probit
Operating Profit-to-Assets Ratio	-0.927*** (0.150)	-0.850*** (0.144)	-0.423*** (0.066)
Debt-to-Assets Ratio	0.889*** (0.045)	0.830*** (0.042)	0.412*** (0.023)
Liquid Assets[3)]-to-Current Liabilities Ratio	-0.026*** (0.005)	-0.026*** (0.005)	-0.010*** (0.002)
Dummy (Interest Coverage Ratio below 1)	0.567*** (0.037)	0.554*** (0.035)	0.244*** (0.017)
Tangible Asset Growth Rate	-0.254*** (0.022)	-0.248*** (0.022)	-0.103*** (0.009)
Sales Growth Rate	-0.369*** (0.034)	-0.356*** (0.033)	-0.155*** (0.014)
Business Age	-0.030*** (0.003)	-0.029*** (0.003)	-0.012*** (0.001)
Log Assets	-0.225*** (0.013)	-0.213*** (0.012)	-0.102*** (0.006)
Industry and Year Dummies	O	O	O

Note: 1) Figures in parentheses are standard errors. Standard errors are clustered at the firm level. Industry dummies are set based on the KSIC division level. Data up to the pre-pandemic period (2014–2019) are used.
* : p<0.10, ** : p<0.05, *** : p<0.01
Source: Corporate financial database given by the NICE Credit Information Service, authors' estimations.

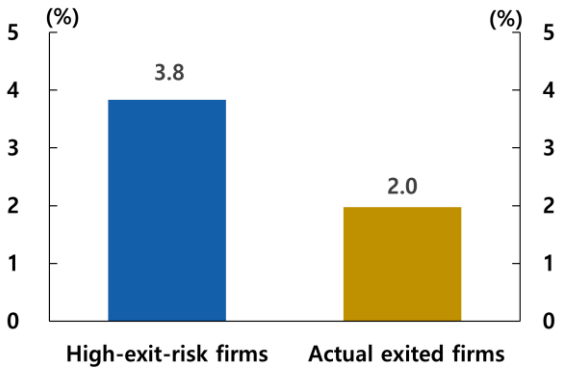
18. Using the model estimation results to calculate the one-year exit probability of individual firms, the share of high-exit-risk firms was approximately 4 percent while the share of firms that actually exited during the analysis period (2 percent) was found to be about half of the high-exit-risk firms (see **Figure 21**)**.** High-exit-risk firms are classified as those with exit probabilities higher than the one-year default probability (5 percent) of speculative-grade corporate bonds, which

[24] A model used for discrete-time survival analysis, which is particularly useful when the frequency of events is low.
[25] This suggests a positive relationship between business downsizing and exit probability

is set as the threshold. These results suggest that there is a substantial number of potential zombie firms that remain in the market despite having high exit risks due to poor profitability and financial conditions.

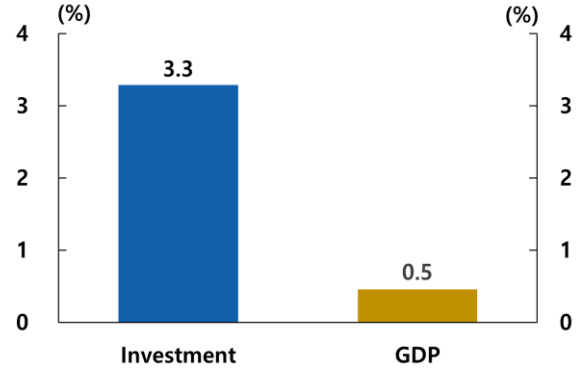
Number of high-exit-risk firms in the sample exceeds the number of firms that actually exited

[Figure 21] Share of High-exit-risk Firms and Actual Exited Firms in the Sample (Post-GFC)



Investment and growth increased when high-exit-risk firms are replaced with viable firms within the industry

[Figure 22] Resulting Increases in Investment and GDP (Post-GFC)



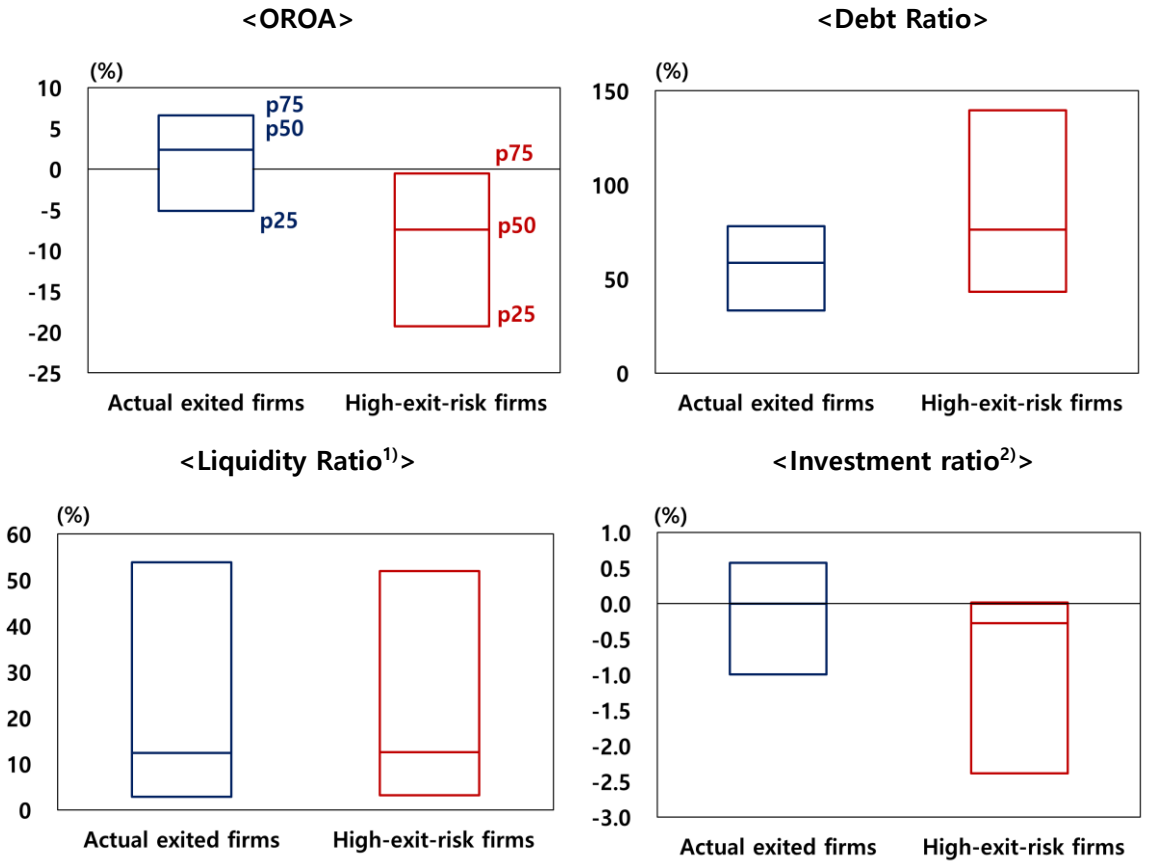
Sources: Corporate financial database given by the NICE Credit Information Service, authors' estimations.

19. Comparing the financial characteristics of high-exit-risk firms with those of actual exited firms found significantly inferior profitability and leverage among the former, though the liquidity ratio was relatively sound (see **Figure 23**).[26] These characteristics suggest the possibility that high-exit-risk firms, despite their weak profit-generating capacity and financial structure, remain in the market by avoiding short-term insolvency or credit crunches through loan maturity extensions and liquidity support.

[26] Since the Global Financial Crisis, financial support has mainly taken the form of maturity extensions (Kwon et al., 2014), payment guarantees, and other measures.

High-exit-risk firms show worse profitability and financial conditions than firms that actually exited, but maintain relatively sound liquidity

[Figure 23] Comparison of High-exit-risk Firms with Actual Exited Firms



Notes: 1) Cash equivalents plus short-term investment assets, divided by current liabilities.
2) Tangible asset increases plus R&D expenses, divided by assets.

Sources: Corporate financial database given by the NICE Credit Information Service, authors' estimations.

20. If high-exit-risk firms had been replaced with viable firms within the industry, domestic investment during the period 2014–2019 is estimated to have increased by about 3 percent, with GDP rising by 0.5 percent (see **Figure 22**). Under the counterfactual assumption that high-exit-risk firms are replaced with firms that exhibit the average investment level of firms with a business history of 10 to 14 years within the same industry, investment is estimated to have increased by 3.3 percent. Given that the investment level of high-exit-risk firms is significantly lower than that of viable firms, the results imply that their smooth entry and exit would have led to a substantial increase in investment, and this type of investment expansion has the potential to generate secondary spillover effects beyond the direct effects. The increase in investment can raise employment, leading to higher household income and stronger consumption, and in particular, an increase in R&D investment can enhance growth potential through technological innovation and productivity improvements. In addition, the exit of zombie firms can improve the efficiency of

resource allocation by mitigating the negative externalities they generate.[27] However, these estimates assume that following the exit of high-risk firms, they are successfully replaced by average-level firms in the industry, either through new market entry or expansion by existing firms. In reality, the replacement process may take considerable time, and in some markets, the replacement may be limited in scope.

Post-Pandemic Period

21. Applying the estimated results to the post-pandemic period (2022–2024),[28] the share of high-exit-risk firms (3.8 percent) was found to be similar to that in the post-financial crisis period, but with a lower share of firms that actually exited (0.4 percent) (see **Figure 24**)**.** While the share of high-exit-risk firms in the sample is similar to that in the post-financial crisis period, their relative share compared to the number of firms that actually exited has increased significantly. As examined earlier (see **Figures 4 and 5**), Korea, unlike the U.S., has seen a decline in firm exits after the pandemic, suggesting that zombie firms have not proceeded to actually exit.

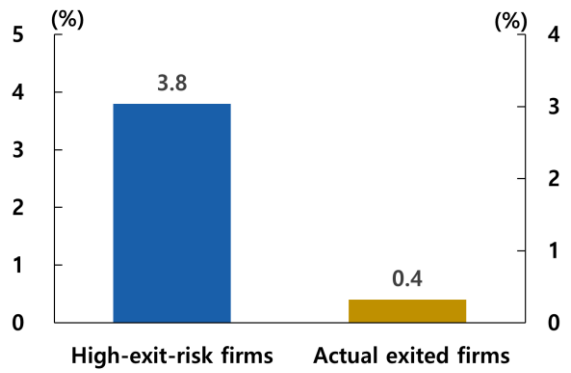
22. Had high-exit-risk firms been replaced with viable firms within the industry during the post-pandemic period, domestic investment is estimated to have increased by 2.8 percent and GDP by 0.4 percent (see **Figure 25**)**.** Comparing the financial conditions of firms that actually exited and high-exit-risk firms in the post-pandemic period, similar to the post-Global Financial Crisis period, the liquidity ratio is comparable, but high-exit-risk firms are inferior to firms that actually exited in terms of profitability, debt ratio, and investment ratio (see **Figure 26**). If the cleansing mechanism had functioned properly through firm exit and entry, resources would have been allocated more efficiently and market dynamism would have been enhanced, which in turn would have led to expanded investment and improvements in productivity.

[27] For example, these include price distortions through excessive competition within the market, inefficient allocation of financial resources, and constraints on the growth of high-productivity firms within the industry.

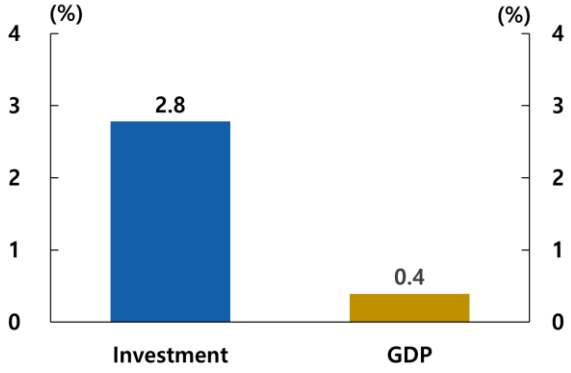
[28] The recession and recovery period following the pandemic (2020–2021) are excluded.

Significant number of high-exit-risk firms remain even after the pandemic

[Figure 24] Share of High-exit-risk Firms and Actual Exited Firms in the Sample (Post-pandemic)



[Figure 25] Effects of Increases in Investment and GDP (Post-pandemic)

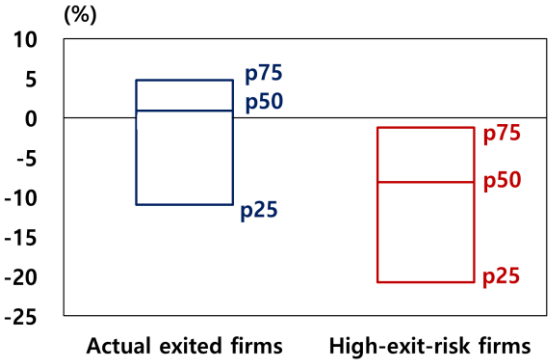


Sources: Corporate financial database given by the NICE Credit Information Service, authors' estimations.

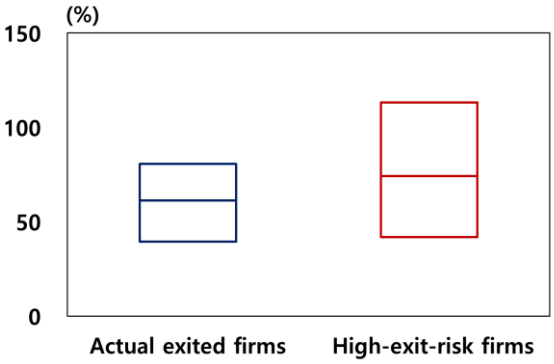
High-exit-risk firms remain inferior to firms that actually exited in terms of profitability and financial conditions except for liquidity even after the pandemic

[Figure 26] Comparison of High-exit-risk Firms with Actual Exited Firms

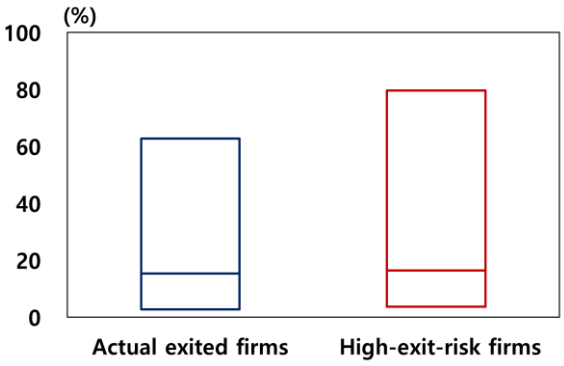
<OROA>



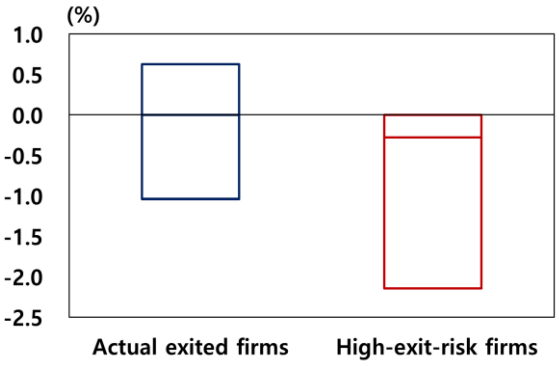
<Debt Ratio>



<Liquidity Ratio[1)]>



< Investment ratio[2)]>



Notes: 1) Cash equivalents plus short-term investment assets, divided by current liabilities.
2) Tangible asset increases plus R&D expenses, divided by assets.

Sources: Corporate financial database given by the NICE Credit Information Service, authors' estimations.

IV. Policy Implications

23. In summary, the diminished growth of the Korean economy in the wake of various crises originated from weakened investment due to deteriorating corporate profitability, then became exacerbated with the inadequate effect of the economy's cleansing mechanism in improving the relevant factors. As examined in the earlier analysis, the trend of weak investment following economic crises is mainly attributable to deteriorating profitability, making it difficult to resolve the investment slump through financial support alone. Fundamentally, it is necessary to establish a cleansing mechanism that facilitates the exit of zombie firms and the entry of new firms, thereby enabling the reallocation of resources to productive and efficient sectors. When zombie firms remain in the market, capital and labor become locked in low-productivity sectors, constraining new entrants and limiting their ability to stimulate innovation and investment. If this inefficient resource allocation persists over the long term, a vicious cycle emerges in which overall economic productivity further deteriorates, and the investment slump intensifies.

24. Therefore, to mitigate the structural slowdown in the growth trend of the Korean economy, it is necessary to (1) orient financial support toward supporting the economy's innovativeness and dynamism above all, through the smooth market entry and exit of firms; and (2) strengthen the future growth engines of the Korean economy by promoting investment in new industries through regulatory easing, thereby creating demand for new products and services. First, low-productivity firms should be encouraged to exit through market-based mechanisms, while the smooth entry of new firms should be facilitated so that the overall productivity of the economy can be enhanced through a selection mechanism. To this end, financial support should be selective and supplementary in its operation to target industries essential to the Korean economy, firms facing temporary liquidity constraints, and innovative early-stage firms. Through these efforts, it is important to enhance the effectiveness of policy support and ensure that it is pursued with a focus on protecting the industrial ecosystem rather than individual firms. Moreover, to mitigate the slowdown of structural demand, it will be essential to ease regulations to support the growth of new industries that create new demand, while maintaining technological competitiveness in Korea's key industries such as semiconductors and automobiles.

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