
Investment Bust in Post-Crisis Korea: Fact or Fiction?

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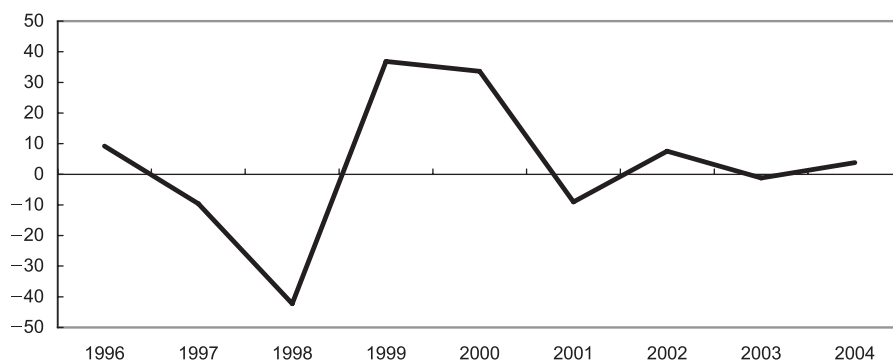
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Abstract

In post-crisis Korea, facility (equipment) investment shows the worrisome trends of a slowdown in investment growth and a decline in investment propensity. We marshal micro and macro data to examine four major explanations for these important developments. Our analysis: (a) finds that cyclical factors such as depressed private consumption in 2003 and 2004 did lead to lower investments in automobiles, hence dragging down total investment growth in these years; (b) rejects the claim that investment was lowered by an "anti-*chaebol* environment" created by the Roh Moo-hyun government (facility investment by large firms actually increased by a great deal in 2003 and 2004, whereas aggregate investment in the national account showed anemic growth); (c) supports the "moral hazard" hypothesis, which states that *chaebol* investment in the pre-crisis period was abnormally high because of implicit state guarantees (the *chaebol* dummy in our investment equations was no longer statistically significant in the post-crisis period, in the aftermath of large-scale bankruptcies); and (d) supports the "hollowing-out" hypothesis, which holds that outward foreign direct investment has reduced domestic facility investment because the price competitiveness of final assembly and other labor-intensive sectors in Korea has been eroded by the rise of late-developing countries such as China and Vietnam.

I. Introduction

A slowdown in facility investment (or equipment investment) has been the subject of intense policy debate in Korea since the economic crisis of 1997–98. As Figure 1 shows, after recording an impressive recovery from the impact of the economic crisis, facility investment has shown anemic growth since 2001. More significant than the slowdown in investment growth has been a noticeable

Figure 1. Growth in Korea's facility investment (1996–2004) (percent)

Source: Bank of Korea.

drop in investment propensity as measured by the ratio of nominal facility investment to nominal GDP. Figure 2 shows that Korea's facility investment propensity has declined, from approximately 14 percent in the pre-crisis period to 10 percent in the post-crisis period.¹ These two developments have caused a great deal of concern in a country so used to the idea of robust investment leading to rapid economic growth.²

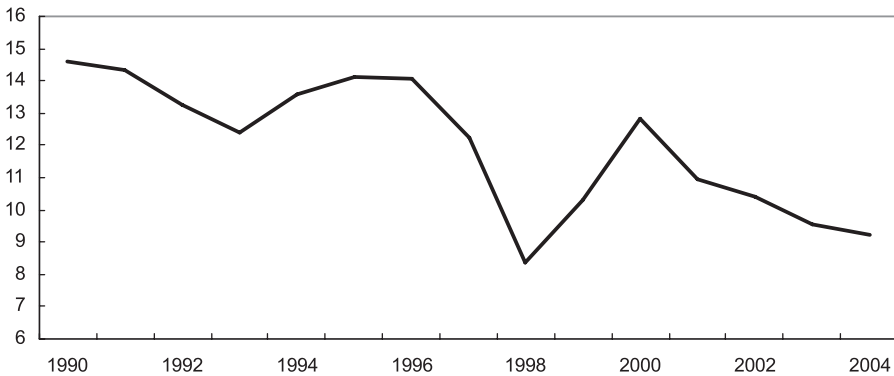
Four hypotheses have emerged to explain the investment slowdown. The first hypothesis attributes these trends in facility investment to changes in risk assessment in the aftermath of large-scale bankruptcies during the economic crisis. According to this first hypothesis, based on the idea of "moral hazard," the weakening of implicit government guarantees against large-scale bankruptcies has led to more prudent investment behavior among large business groups, which had benefited from such government guarantees in the pre-crisis period.³

The second hypothesis blames antibusiness sentiments, onerous regulations, and takeover threats, especially in regard to the *chaebol*, Korea's large family-based business groups. In particular, it alleges that the Roh Moo-hyun government's hostile

1 The IMF has noted a similar decline in investment propensity in other Asian countries that were affected by the economic crisis of 1997–98. See International Monetary Fund (2005).

2 On the relationship between investment and economic growth, see De Long and Summers (1991) and Jones (1994).

3 For a historical perspective on this problem, see Lim (2003).

Figure 2. Nominal facility investment as a percentage of nominal GDP (1990–2004)

Source: Bank of Korea.

policy toward the *chaebol* has led to a slowdown in investment growth and a decline in investment propensity.⁴

The third hypothesis sees “hollowing out” caused by increasing outward foreign direct investment (FDI), with China being the primary destination. In this view, outward FDI is a substitute for domestic facility investment.

The fourth hypothesis cites cyclical factors such as stagnant domestic consumption as the main culprit for the slowdown in investment growth.

In this paper, we test each of the hypotheses outlined above. In particular, we note that the first two hypotheses have different implications for firms of different sizes, as the weakening of implicit government guarantees and the adoption of an anti-*chaebol* policy would predominantly affect only the large business groups. Also, we observe that the moral hazard hypothesis posits a change in the investment behavior of the *chaebol* in the post-crisis period, whereas the “anti-*chaebol* environment” hypothesis focuses on a later period starting in 2003, with the inauguration of the

4 For instance, at a National Assembly hearing on Korea’s fair trade law in July 2004, a representative from the Federation of Korean Industries (FKI) argued that *chaebol* reform should be left to the market and that government regulation was depressing investment. Also, the conservative *Chosun Ilbo* set investment as one of the top 10 items on Korea’s economic agenda at the end of 2004 and asserted that the government’s prolabor orientation discouraged entrepreneurs from undertaking facility investment. These pro-*chaebol* voices typically pointed to weak aggregate investment in 2003 and 2004 as their evidence, apparently assuming that weak aggregate investment implied weak investment by large family-based business groups. See Lee (2005) and Hong (2005).

Roh government. As for the hollowing-out hypothesis, the critical question is whether outward FDI and domestic facility investment are substitutes or complements. Finally, we note that the “business cycle” hypothesis has more to do with trends in investment *growth* than with investment *propensity*.

2. Data and methodology

To test the four hypotheses outlined above, we use five sets of data: (1) national account; (2) financial statement analysis data compiled by the Bank of Korea; (3) financial data of externally audited companies; (4) financial statements and disclosure data set of listed companies; and (5) FDI data collected by the Korea Export-Import Bank.⁵

The national account allows us to track aggregate trends in facility investment, which consists of investment in machinery and transportation equipment, including automobiles. Among the five data sets, it has the most comprehensive coverage, but its level of aggregation is such that it is not conducive to detailed analysis of facility investment by firm size or by industry.

The financial statement analysis data make it possible to put recent trends in historical perspective because they cover corporate performance in Korea’s manufacturing sector since the 1960s. This data set is an interesting mixture in terms of coverage. On an annual basis, the Bank of Korea analyzes the financial statements submitted by a sample of approximately 3,000 firms out of approximately 37,000 nonfinancial taxpaying corporations with an annual sales of at least 2 billion won. The sample includes all publicly listed firms, all firms with an annual sales of at least 70 billion won, and all top-five firms based on sales in each industry as well as representative smaller firms from each industry. (We note that there are more than 4 million companies in Korea.)

The micro data set tracking the performance of externally audited or listed companies allows us to take a detailed look at the investment behavior of firms based on their size and other characteristics. For externally audited firms, with an asset size of 7 billion won or more, we use a data set compiled by the National Information and Credit Evaluation, Inc. (NICE), a credit-rating agency. The number of firms included in the data set varies from year to year because NICE does not collect financial information on all externally audited firms but rather focuses on the firms whose credit it evaluates in a given year. This data set covers more than 7,000 firms, including some

⁵ Our methodology is similar to that used in Becker et al. (2006).

Table 1. Trends in facility investment (1995–2004—Nominal) (trillions of won)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Facility investment	71	77	70	40	55	74	67	72	71	74
Transportation equipment	18	19	17	8	14	17	15	17	15	13
Automobiles	14	15	14	7	12	13	14	5	12	10
Other transportation equipment	3	4	2	1	2	3	1	1	2	3
Machinery	52	57	52	31	41	56	51	55	56	60
General machinery	34	37	31	14	17	23	20	22	23	26
Electrical and electronic machinery	10	12	13	11	17	24	23	24	22	22
Precision tools	5	5	5	3	4	6	5	6	8	10
Other machinery	2	2	2	1	1	1	1	1	1	1

Source: Bank of Korea.

small and medium-sized enterprises (SMEs) with no more than 300 employees, but with an asset size of 7 billion won or more. By contrast, the data set of listed companies is more consistent and reliable but is much narrower in coverage, as it contains approximately 1,000 companies.

To analyze facility investment trends by firm size and other characteristics, we use cash flow statement data and define facility investment as the difference between the cash outflow from acquisition of machinery and equipment and the cash inflow from disposal of machinery and equipment. Land and property transactions are excluded.

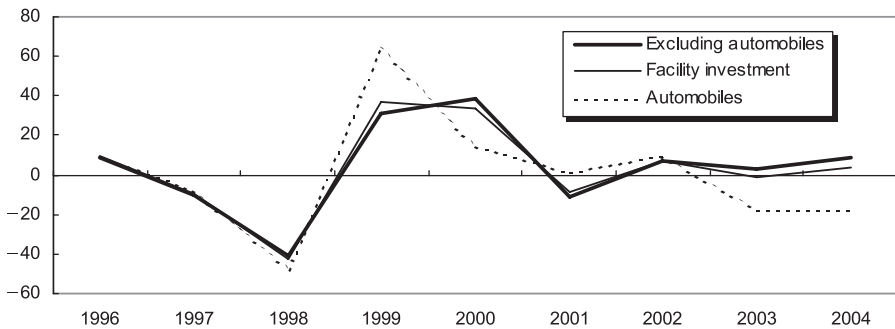
3. Recent trends in Korea's facility investment: A closer look

3.1 Aggregate trends

In the national account, facility investment consists of investment in machinery and transportation equipment. Table 1 shows trends in facility investment by component.

Figure 3 shows the growth rate of facility investment before and after investment in automobiles, the most important component of transportation equipment, is included. We can see that the depressed facility investment in 2003 and 2004 is partly due to a sharp decline in the purchase of automobiles for business use. In fact, the growth rate of facility investment excluding automobiles is 3.1 percent in 2003 and 8.5 percent in 2004, whereas the growth rate drops to -1.2 percent and 3.8 percent, respectively, when automobiles are included. Investment in automobiles appears quite volatile.

The service sector, which is sensitive to fluctuations in private consumption, accounts for most of the investment in automobiles. This suggests that investment in

Figure 3. Growth rate of facility investment including and excluding automobiles (percent)

Source: Bank of Korea.

automobiles would be sensitive to fluctuations in private consumption, and this is indeed the case: Depressed private consumption in 2003 and 2004 led to low investment in automobiles for business use, which in turn accounted for a slowdown in facility investment growth, at least in part.⁶

However, cyclical factors provide a rather incomplete solution to the investment puzzle. In particular, they cannot account for the decline in investment propensity in the post-crisis period. Figure 4 shows changes in the facility investment ratio and machinery investment ratio over the past decade. While the facility investment ratio has dropped from 14 percent in the pre-crisis period to 10 percent in the post-crisis period, the machinery investment ratio has declined from 11 percent to 9 percent. We can deduce that nominal investment in transportation equipment as a percentage of nominal GDP has declined from 3 percent to 1 percent. This structural change should be explained.

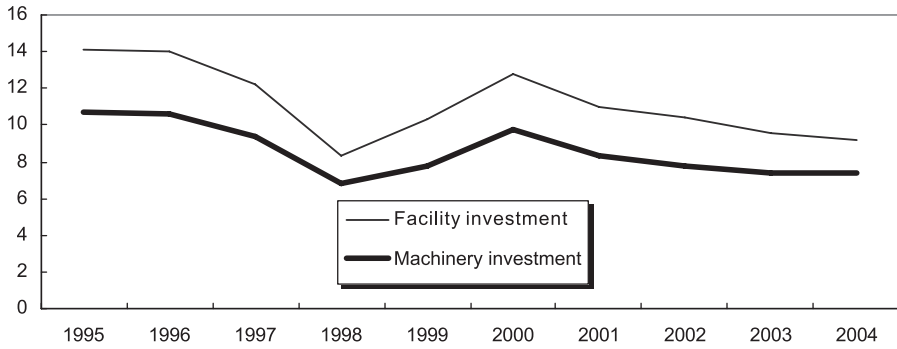
3.2 Investment patterns by firm characteristics

By using the national account data in conjunction with financial data from listed companies, we can see whether listed companies have exhibited an investment behavior distinct from the rest of the economy. Figure 5 compares the growth rate of facility investment in the national economy as a whole with that among listed companies only.

Table 2 places facility investment growth in a comparative perspective. From Figure 5 and Table 2, we can see that there are four periods in which listed compa-

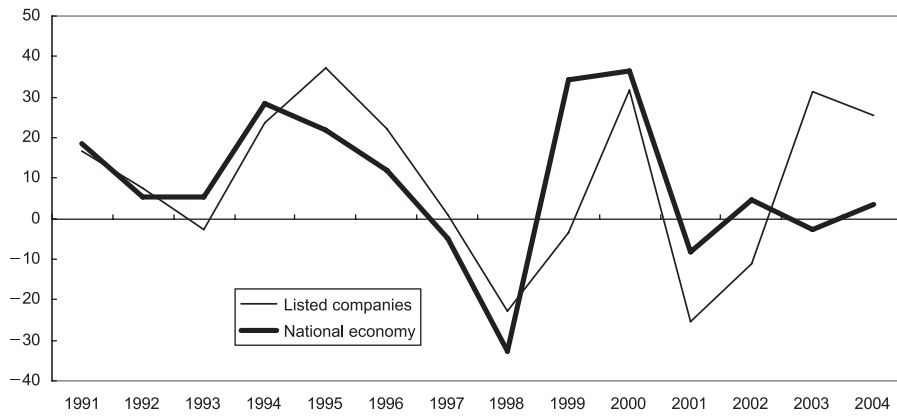
⁶ For details, see Lim (2005, 20–24).

Figure 4. Nominal facility investment and machinery investment as a percentage of nominal GDP (1995–2004)



Source: Bank of Korea.

Figure 5. Facility investment growth: National economy versus listed companies (percent)



Source: Bank of Korea, WiseEn.

Table 2. Facility investment growth: A comparison (year on year, percent)

	1996	1997	1998	1999	2000	2001	2002	2003	2004
National economy	12.1	-4.8	-32.5	34.2	36.3	-8.1	4.5	-2.7	3.7
Listed companies only	24.4	-1.7	-26.9	-5.9	25.8	-25.7	-12.8	34.8	31.4
Excluding listed companies	-3.2	-9.7	-42.3	123.1	46.1	6.1	14.3	-18.8	-16.1

Source: Bank of Korea, WiseFn.

nies exhibited a rather different investment behavior from the rest of the economy. To the extent that listed companies tend to be large, well-established, and international in outlook, this divergence in investment behavior reflects structural conditions that affected firms with different characteristics in different ways.⁷

From 1994 to 1996, listed companies increased their facility investment at a much higher rate than the rest of the economy. This period coincided with a boom in the global economy, and large Korean companies invested aggressively, expecting that the government would come to their rescue should they get into trouble—an example of moral hazard.⁸ In the aftermath of large-scale bankruptcies during the 1997–98 economic crisis, however, large companies began to hunker down and undergo painful corporate restructuring. In fact, the next few years saw facility investment undertaken by listed companies growing at a lower rate than the rest of the economy. In 1999 and 2000, although facility investment by listed companies showed a strong recovery, it was overshadowed by robust investment by the rest of the economy, as new venture firms in particular took advantage of the information technology boom in this period. In 2001 and 2002, listed companies bore the brunt of a slowdown in the global economy, whereas the rest of the economy did much better, thanks to a consumer credit boom.

The tide began to turn in 2003, as measures taken to curb the growth of credit card debt led to a consumption bust. Financially healthier than ever after years of corporate restructuring and encouraged by a recovery in the global economy, listed companies rapidly increased their facility investment in 2003 and 2004, after the Roh government took office. While growth in facility investment for the national economy as a whole was anemic, facility investment by listed companies soared in this period. As shown in Table 2, this turnaround in facility investment by listed compa-

7 For a more detailed discussion of economic conditions in Korea, see the OECD's annual *Economic Survey of Korea*, particularly from the years 1998 through 2004.

8 See Hahn (2000). Using firm-level data in the pre-crisis period, Hahn shows that, compared with other firms, top-ranking business groups tended to maintain higher investment rates and increase investment when uncertainty rose. This investment pattern is consistent with moral hazard.

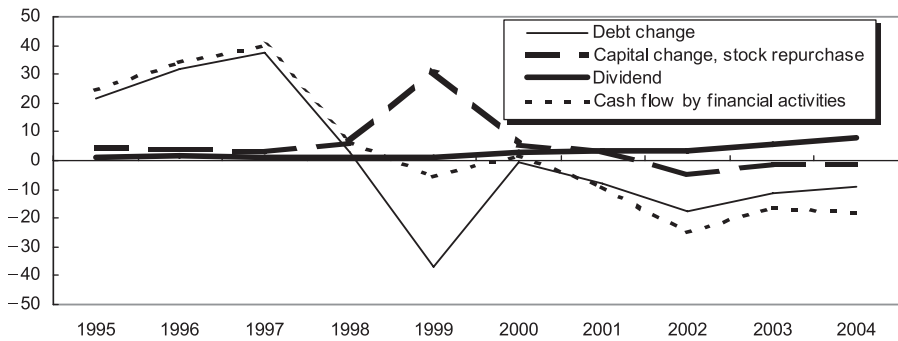
nies suggests that the anti-*chaebol* environment hypothesis is unlikely to be valid. After all, listed companies tend to be large and well-established firms, many of which belong to the *chaebol*, and the hypothesis focuses on 2003 and 2004, a period of robust investment by listed companies.

In fact, the anti-*chaebol* environment hypothesis advanced by big business interests suffers from some fundamental problems, both on the explanatory-variable side and the dependent-variable side. Although many analysts have claimed that the unleashing of anti-*chaebol* policy and sentiment in 2003 and 2004 had a depressing effect on facility investment, they have provided little evidence for such a shift in policy or sentiment. This is actually understandable, because government policy toward the *chaebol* changed very little in these years. Moreover, although designing an appropriate metric for anti-*chaebol* sentiment is not a trivial matter, opinion surveys taken in 2001 and 2004 indicate that, if anything, the public perception of large companies in Korea had *improved* over the period.⁹

As for the dependent variable, although pro-*chaebol* voices typically assume that the anemic *aggregate* investment growth in 2003 and 2004 (−2.7 percent and 3.7 percent, respectively) implies weak investment by large companies in the same period, the numbers tell a rather different story. Table 2 shows that facility investment by listed companies actually increased by more than 30 percent in each of these two years. In theory, an ardent supporter of big business could argue that facility investment by listed companies in these two years would have increased by, say, 50 or 60 percent if not for the dampening effect of the anti-*chaebol* environment; however, no one has taken such an extreme position.

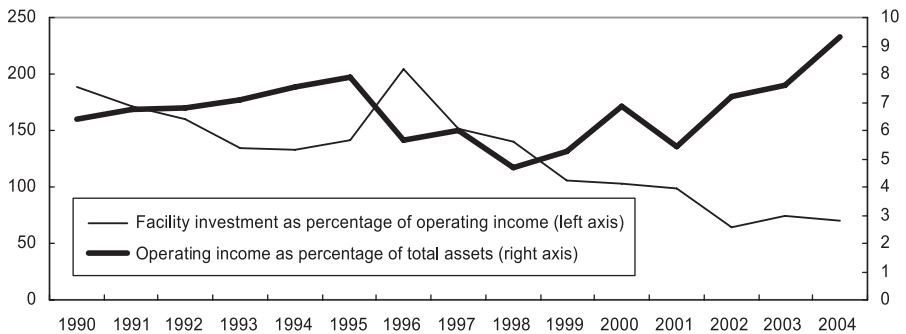
Using financial data from listed companies, Figures 6, 7, and 8 show how these companies changed their investment behavior in the wake of the economic crisis. Figure 6 shows that the cash flow of listed companies due to financial activities was positive in the pre-crisis period, primarily as a result of a massive increase in debt, which rose by tens of trillions of won each year. In the aftermath of the crisis, however, listed companies issued new stocks to reduce the debt overhang. In fact, the cash flow of listed companies due to financial activities has been negative since 1999 thanks to their aggressive efforts to improve their financial stability. Their dividend payouts have also increased, with a greater focus on shareholder value.

⁹ An opinion survey conducted by the Korea Development Institute (KDI) in November 2001 showed that only 36.1 percent of respondents had a favorable view of large companies in Korea. By comparison, an opinion survey by the Federation of Korean Industries (FKI) in November 2004 showed that 57.4 percent of respondents had a favorable view of large companies. See KDI (2001) and FKI (2004).

Figure 6. Cash flow of listed companies due to financial activities (trillions of won)

Source: WiseFn.

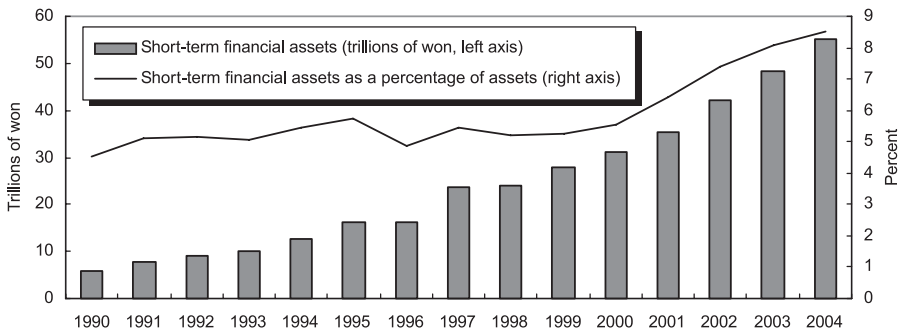
Note: The category "Capital change, stock repurchase" refers to the change in stockholders' equity due to stock issue, equity write-down, and stock buyback. Companies repurchase their shares to cope with a hostile takeover bid or to increase the value of floating shares in the market.

Figure 7. Profitability and investment propensity of listed companies (percent)

Source: WiseFn.

Figure 7 shows that although listed companies have become more profitable, they have tended to be more conservative in their investment behavior in the post-crisis period. Operating income as a percentage of assets (profitability) has increased significantly, but facility investment as a percentage of operating income (investment propensity) has exhibited a downward trend.

Figure 8 shows the improved liquidity position of listed companies since the economic crisis. Apparently to shield themselves from a credit crunch, these companies

Figure 8. Improved liquidity of listed companies

Source: WiseFn.

have greatly increased their cash holdings and raised the proportion of liquid assets in their overall asset portfolio.

To test the moral hazard hypothesis, we look at how investment propensity, as measured by the ratio of facility investment to total assets, has changed for the *chaebol* in the post-crisis period.¹⁰ Table 3 summarizes the regression results. While the coefficient on the *chaebol* dummy is positive and significant in the pre-crisis period, it is not statistically significant in the post-crisis period. In other words, in the pre-crisis period, a *chaebol* tended to have a much higher investment propensity than other firms. The *chaebol* discounted the downside risks because it apparently expected the government to come to its rescue should it get into trouble. However, after as many as 16 of the top 30 business groups went bankrupt in the wake of the crisis, a *chaebol* clearly had to change its assumptions about the government's implicit guarantees. As a result of this change in risk assessment, the *chaebol's* investment propensity in the post-crisis period is not statistically different from other companies', after such factors as profitability and sales growth are controlled for. This result is consistent with the moral hazard hypothesis.

These changes in investment behavior are also evident from financial statement analysis data collected by the Bank of Korea, which include not only listed compa-

¹⁰ Note that the dependent variable is the ratio of facility investment to total assets, not the ratio of facility investment to operating income (or some other measure of "value-added," equivalent in concept to GDP at the aggregate level). This particular choice for "investment propensity" at the firm level is informed by the fact that disaggregated operating income (or some other measure of "value-added") tends to be quite volatile, whereas facility investment is characterized by multiyear planning and implementation.

Table 3. Investment propensity of the *chaebol* before and after the crisis

	1990–96 facility investment/assets	1999–2003 facility investment/assets
Operating income/assets	0.026 (1.74)*	0.030 (2.96)***
Operating income/assets ($t - 1$)	0.044 (3.42)***	0.045 (4.35)***
Net sales growth	0.003 (1.99)**	0.009 (3.82)***
<i>Chaebol</i> dummy	0.029 (11.43)***	0.002 (0.94)
Number of employees	-4E-04 (-0.20)	-0.008 (-3.58)***
Number of observations	3,772	2,906

Source: Authors' calculations.

***Statistically significant at 10 percent.

**Statistically significant at 5 percent.

*Statistically significant at 1 percent.

nies, but also all firms with an annual sales of at least 70 billion won and all top-five firms based on sales in each industry as well as representative smaller firms from each industry.

With regard to financial stability, the average debt-to-equity ratio has seen a remarkable decline in the post-crisis period. As Figure 9 shows, the decline in the debt-to-equity ratio in the post-crisis period has been nothing short of dramatic. In fact, the debt-to-equity ratio of 104.2 percent in 2004 is lower than comparable figures in the United States in 2004 and Japan in 2003, as indicated in Table 4.

The current ratio of liquid assets to short-term debts also has improved much in comparison with the pre-crisis average, rising to 117.0 percent in 2004. This figure is comparable to the level in the United States and Japan. It suggests that concerns about Korean companies' overaccumulating cash reserves may be exaggerated.

Trends in the interest coverage ratio (measured here as the ratio of operating income-to-interest expenses) also show the extent of improvement in the long-term financial stability of Korean firms. The ability of Korean firms to generate cash flow relative to their debt service obligations has improved a great deal since 1998. From the pre-crisis average of 123.5 percent, the interest coverage ratio for the Korean manufacturing sector soared to 575.8 percent in 2004.

If we look at economic value added (EVA), we can see a significant change in the investment behavior of Korean companies. As Table 4 shows, during the 1992–96 period, the weighted average cost of capital for the Korean manufacturing sector

Figure 9. Average debt-to-equity ratio for the Korean manufacturing sector



Source: Bank of Korea.

Table 4. Performance indicators for the Korean manufacturing sector (1990–2004) (percent)

	1990–96 average	1997	1998	1999	2000	2001	2002	2003	2004	United Japan (2003)	United States (2004)
Financial stability indicators											
Debt-to-equity ratio	301.7	396.3	303.0	214.7	210.6	182.2	135.4	123.4	104.2	145.8	141.2
IBD-to-assets ratio	45.7	54.2	50.8	42.8	41.2	39.8	31.7	28.3	24.0	28.7	22.9
Current ratio	94.8	91.8	89.8	92.0	83.2	97.9	106.1	109.8	117.0	131.8	128.6
Profitability indicators											
Operating income-to-sales ratio	7.1	8.3	6.1	6.6	7.4	5.5	6.7	6.9	7.6	3.9	6.6
Ordinary income-to-sales ratio	2.1	-0.3	-1.8	1.7	1.3	0.4	4.7	4.7	7.8	3.9	9.0
ROIC	9.0	7.6	10.3	6.4	8.7	7.3	—	—	—	—	—
WACC	10.1	9.2	14.0	7.9	8.6	6.9	—	—	—	—	—
Financial expenses-to-sales ratio	5.7	6.4	9.0	6.9	4.7	2.6	2.6	1.9	1.3	0.7	1.7
Interest coverage ratio	123.5	129.1	68.3	96.1	157.2	132.6	260.3	367.1	575.8	578.2	397.1
Growth indicators											
Sales growth rate	15.1	11.0	0.7	8.0	15.2	1.7	8.3	6.1	17.1	2.0	12.5
Tangible asset growth rate	16.3	13.7	17.2	-0.0	2.4	-1.5	-2.2	1.7	4.8	-2.7	-0.2

Source: Bank of Korea, *Financial Statements Analysis*, various years.

Note: IBD (interest-bearing debt); current ratio = liquid assets/short-term debt; ROIC (return on invested capital); WACC (weighted average cost of capital); interest coverage ratio = operating income/interest expenses. The pre-crisis averages for ROIC and WACC are for the 1992:H1–1996:H1 period. The post-crisis figures for the two financial variables are also first-half figures. — = not available.

Table 5. Composition of externally audited companies and their facility investment

	Manufacturing	Nonmanufacturing
Large	656 firms 3.2 billion won (45.1 percent)	479 firms 1.7 billion won (23.9 percent)
Small and medium-sized	4,889 firms 0.7 billion won (9.3 percent)	1,351 firms 0.2 billion won (3.2 percent)

Source: Korea Information Service.

exceeded its return on invested capital. In other words, EVA in this period was negative. In the wake of massive corporate failures, however, firms apparently came to reassess the opportunity cost of capital relative to return on investment. This change in risk assessment has helped to improve the total EVA for the manufacturing sector. In fact, EVA has turned positive since 2000. The performance of firms listed on the Korea Stock Exchange also shows a similar trend. Approximately 70 percent of publicly listed firms had a negative EVA during the 1992–96 period. After reaching a peak of 80 percent in 1997, however, the proportion of listed firms with a negative EVA began to decline and reached 54 percent in 2001. Although the Korean corporate sector still has some room to improve, it is moving in the right direction.

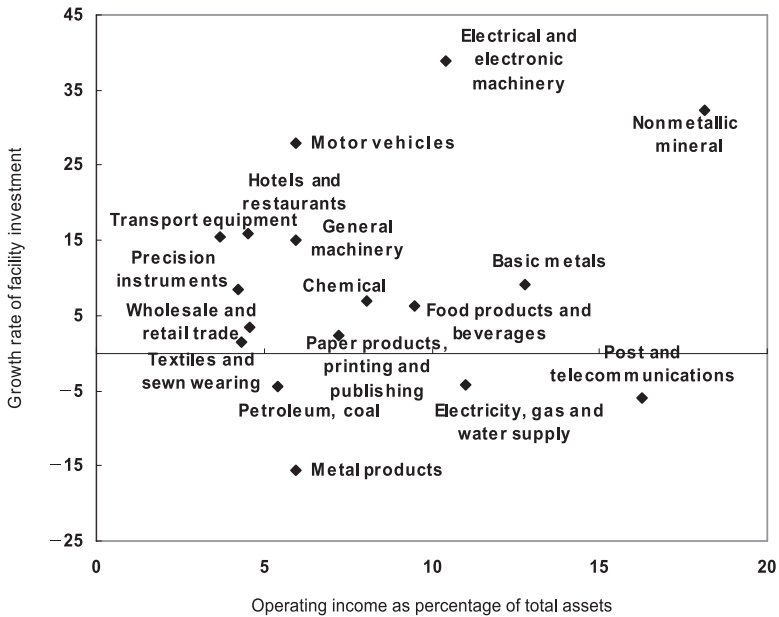
As for growth indicators, the post-crisis period has seen a dramatic reduction in the growth rate of tangible assets. As Table 4 shows, on average, tangible assets grew at an annual rate of 16.3 percent during the 1990–96 period as Korean firms carried out massive investment projects. Since the crisis years of 1997–98, however, tangible asset growth has been anemic. Although this slowdown in investment in the post-crisis period has caused some concern among policymakers preoccupied with Korea's growth prospects, it may be interpreted as a natural consequence of reduced moral hazard. To the extent that companies included in the financial statement analysis data tend to be large and well-established, changes in their investment behavior reflect structural changes in the post-crisis period.

3.3 Investment patterns by firm size and industry characteristics

In this section, we use financial data from externally audited companies to analyze investment patterns by firm size and industry characteristics. Our data set consists of 7,375 firms. Their total facility investment, amounting to 5.9 billion won, accounts for 82 percent of the aggregate facility investment in the national account. Table 5 shows the composition of the data set.¹¹

¹¹ In Korea, the cutoff point between large enterprises and SMEs is 300 employees. Although there is no clear economic reasoning behind this cutoff point, SMEs get favorable government support of various kinds.

Figure 10. Profitability versus facility investment growth: Large companies, 2002–04 (percent)



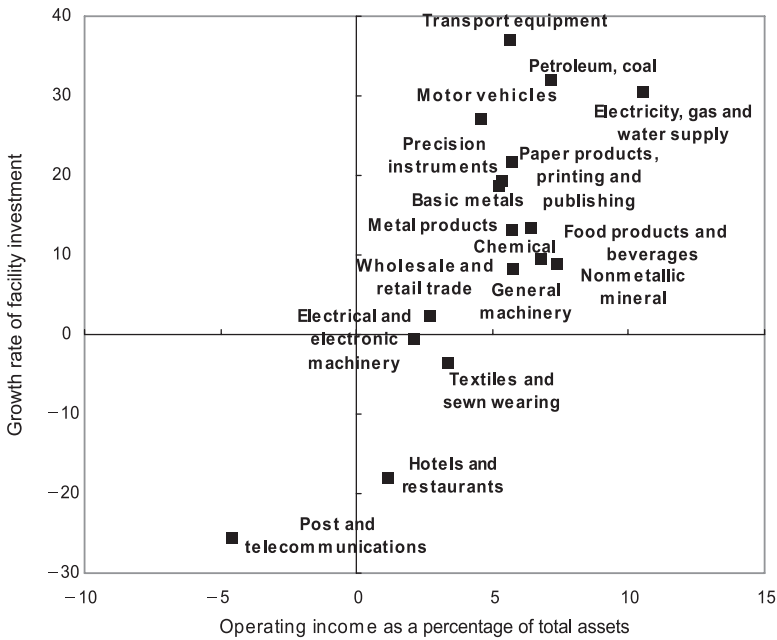
Source: Korea Information Service.

Figures 10 and 11 show that a positive correlation exists between profitability and facility investment growth. We note that in some sectors such as electrical and electronic machinery, large companies and SMEs have exhibited different investment patterns.

3.4 Impact of FDI

Figure 12 shows outward FDI by large companies and SMEs in the manufacturing sector. A rapid increase in FDI by SMEs since 2002 is unmistakable. To examine the hollowing-out hypothesis, we combine FDI data from the Export-Import Bank of Korea with financial data from externally audited companies. We divide the sample into firms with outward FDI experience and firms without such experience and then look at (domestic) facility investment as a percentage of fixed assets. For large companies, it turns out that facility investment is 12 percent of fixed assets for those with FDI experience while it is only 9 percent for those without such experience. For SMEs, however, the relationship is reversed, at 11 percent and 13 percent, respec-

Figure 11. Profitability versus facility investment growth: Small and medium-sized enterprises, 2002–04 (percent)



Source: Korea Information Service.

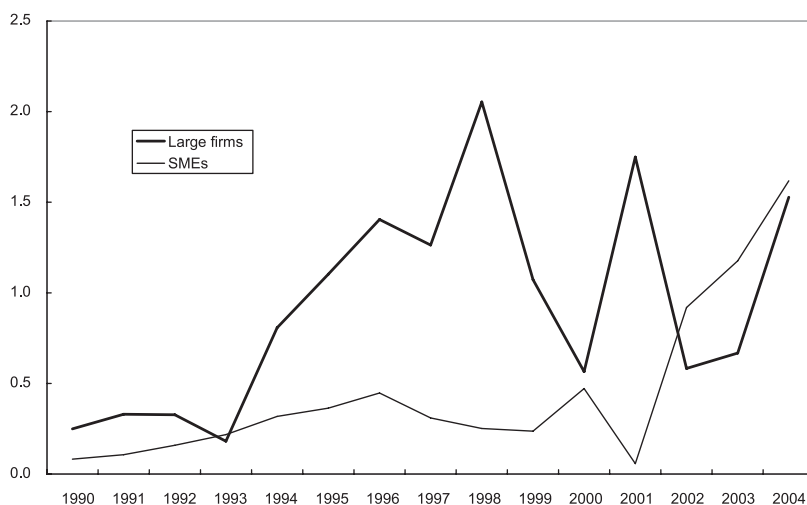
tively. In fact, most industries seem to exhibit some crowding-out effects, except for the large firms in the electrical and electronic machinery sectors.

4. Conclusion

In this paper, we have taken a close look at recent trends in Korea's facility investment and have tested alternative hypotheses regarding the slowdown in investment growth and decline in investment propensity. We summarize our findings below.

The recent slowdown in Korea's facility investment growth is partly due to cyclical factors. In particular, the depressed facility investment in 2003 and 2004 is in part due to a sharp decline in the purchase of motor vehicles for business purposes. Depressed private consumption in 2003 and 2004 led to low investment in automobiles, while investment in machinery was robust, especially in 2004. However, cyclical factors provide a rather incomplete solution to the investment puzzle, because

Figure 12. Outward foreign direct investment by large firms and small and medium-sized enterprises (trillion won)



Source: Export-Import Bank of Korea.

they cannot account for the decline in investment propensity in the post-crisis period.

To examine this structural change, we focused on the investment behavior of large companies. We found evidence in support of the moral hazard hypothesis. A series of large-scale bankruptcies during the 1997–98 crisis apparently shattered the notion of implicit government guarantees and affected the risk perception of the *chaebol*. A regression analysis on investment propensity showed that the coefficient on the *chaebol* dummy was no longer statistically significant in the post-crisis period. When we looked at financial data sets predominantly containing large companies, we saw important changes in financial indicators suggesting more prudent investment behavior.

At the same time, we found evidence rejecting the anti-*chaebol* environment hypothesis. Facility investment by large firms actually increased by a great deal in 2003 and 2004—a rather odd phenomenon in a period supposedly marked by the unleashing of anti-*chaebol* sentiments. Although business leaders, representing the interests of large firms, have tended to argue that business-friendly policies should be adopted if investment is to be revived, their investment has actually shown robust growth in recent years.

Finally, we found evidence for the hollowing-out hypothesis. Outward FDI appears to be crowding out domestic facility investment somewhat, except in some sectors such as electrical and electronic machinery involving large companies. However, in a dynamic context, where the price competitiveness of final assembly and other labor-intensive segments would be eroded by the entry of late-developing countries, outward FDI may be the only commercially viable form of investment unless companies possess skills to move up the quality ladder.

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