

The Undercurrent of the Crisis in Korea

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ABSTRACT

This paper aims to identify the underlying causes of the Korean economy leading to the 1997 crisis. Its main findings include that the profit rate shows a declining trend for an extended period over a decade before the crisis and its main cause was the continuous and fast deteriorating capital productivity. While policy mistakes on exchange rate management and financial liberalisation were more direct causes to trigger off the crisis, reckless investment behaviours were primarily responsible for deteriorating capital efficiency, which gave mounting stress on the economy and eventually developed to a crisis. The reason behind widespread imprudent investments was the dismantling of the traditional privilege-disciplinary regime of industrial policy from the late 1980s. In order to improve investment

efficiency, this study suggests that the reform should focus on devising a mechanism to discipline corporate behaviour through corporate governance reform, if not going back to the past industrial policy regime.

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1. INTRODUCTION

While the debates continue over the causes of the Asian crisis, the whole picture still seems more blur than clear. The explanations on the mechanism of the crisis vary depending on what aspect of the events leading to the crisis is focused and the following interpretations are, at best, loosely coherent. Though each theory has its own merit, they are isolated anecdotes rather than complementing analyses. Consequently, one cannot help but feel that there are some missing parts to each explanation.

This study does not aim to investigate the direct cause or the evolving mechanism of the crisis in Korea. Rather, it attempts to identify the *underlying* cause leading to the crisis. Also, this paper is to complement, rather than repudiate, the existing analyses. It does so by identifying the underlying trend of the real sector based on profitability analysis. It will delineate several key factors affecting profitability, such as labour and capital productivity, wages, and relative prices. And through synthesising their effects, it will demonstrate what the main causes of decline were, which in turn would provide possible lessons for reform.

Section 2 briefly examines the shortcomings of some leading theories of the Asian crisis in order to shed light on the fact that the crisis originated from the supply side of the economy rather than merely the flaws in the financial sector. In section 3, the growth performance including changes in output and investment growth rates for a decade prior

to the crisis is re-assessed. In particular, the manufacturing profitability trend is juxtaposed upon those growth indicators. Section 4 delineates the contributing factors of the profit rate in order to identify what factors were responsible for deteriorating efficiency of investments. Section 5 will argue that declining capital productivity was primarily responsible for poor investment performance.

Then, in section 6, several questions are raised such as why investment spree continued in spite of obvious symptoms of declining profitability and efficiency and why such investment behaviours were not checked. These questions will be investigated in view of the transformation of the industrial policy regime from the late 1980s. This will give a threading clue connecting various claims about cronyism, moral hazard, and corruption. Concluding part will suggest the possible lessons from this analysis and the reason why the focal point of the reform policy should be overhaul of the corporate governance in Korea.

2. CONTENDING INTERPRETATIONS STILL TO BE ANSWERED

Let's briefly examine some of the leading theories. A frontier and prophet-like theory is Krugman's 'perspiration theory' (Krugman, 1994). As well known, two implications can be drawn from this theory; first, 'input-driven' growth shall end sooner or later and there is little prospect that the high-performing Asian economies will continue to experience high growth. Because, second, institutional deficiency, or so-called 'cronyism' of these countries shall make them pay price for inefficiency. As the payment became realised, though Krugman may not have expected as spectacular as the unfolding crisis, the attention shifts to other relating issues of cronyism, such as moral

hazard, corruption, Asian values and so on.¹

Most advocates of the cronyism theory a priori assume that the lack of market discipline and discretionary system hamper efficiency, but this still remains as one of the contending issues in economics. While they show ample examples of corruption and bureaucratic abuse in these countries, they have yet to prove how the messy institutional discipline led to bad economic performance, let alone the crisis. Moreover, some aspects of cronyism have even been praised as the elements of the ‘miracle’.

For example, a cosy relationship between government and business was applauded as a showcase of partnership rather than the origin of corruption. It was considered that the discretionary system by the rule of man made it possible to cope with volatile market changes swiftly, rather than laying a ground for moral hazard. One thing for certain is that all these economies have lived with such corruption and cronyism for decades during the high growth period. The point here is not that cronyism does not hinder growth, but to show the mechanism of how it affected the real economy.

In line with this perspective is the financial crisis theory. On the one hand, cronyism caused a havoc of moral hazard in financial sectors in those countries, which have operated based mainly on the rule of thumb (Stiglitz, 1998). This position highlights institutional flaws of the domestic financial sector. The lax prudential regulations made financial institutions behave irresponsibly, and that led to a virtual collapse of the whole financial system.

On the other hand, some argue that international financial system has fundamental weakness in coping with increasingly volatile financial flows across the borders. And on

¹ While Krugman has made himself distant from his original position, this ‘cronyism’ theory becomes increasingly dominant in the debate. Wade (1998), Haggard (1999).

top of the defect at the international dimension, some policy mistakes like exchange rate and macroeconomic management triggered the crisis.² In particular, ill-designed and ill-prepared financial liberalisation policy in the 1990s made the economies vulnerable to international financial volatility. Hence, though those economies should share the blame, the punishment in the scale of crisis was rather excessive (Sachs and Radelet, 1999).

An implicit assumption of this account is that the Asian crisis is a largely ‘financial’ crisis in origin rather than a crisis of the ‘real economy’. It is implicated that while the real economy was by and large performing well, the breakdown came from the financial collapse. A wild conclusion can be drawn from this position that the real economy can resume high growth as long as corrections of financial system, both domestic and international, are made.

Though all explanations have their own merit, they seem to focus on a particular aspect, and there is little analyses of how they are all related. In explaining the crisis and diagnosing subsequent reforms, however, the crucial point is to examine what has happened in the ‘real’ sector. If there were no significant symptoms indicating deterioration in the performance of the economy, then the crisis could be said to be a temporary disruption of a sort due to financial faults. If so, the whole direction of reform should be different.

3. PROFITABILITY TREND

Symptoms in the Growth Performance.

² For a comprehensive account of macroeconomic management of selected Asian countries, see Ichimura *et al.* (1998).

For decades, the Korean economy has enjoyed high growth. Even just years prior to the crisis in 1997, it recorded considerably high growth rates of GNP- 8.9% in 1995 and 7.1% in 1996. From a long term perspective, however, there was a certain pattern of growth performance. As shown in Table 1, the average growth rates of GDP of both the economy as a whole and the manufacturing sector show a significant decline in the 1990s compared to the late 1980s. Also, the growth rate of investment in the 1990s dropped to less than half the level of the late 1980s.

The big swing in growth performance can be interpreted in several different ways. First, even though the growth rate has declined, an average of 7-8% per annum is still high by any standard. Rather, an over 10% growth rate is exceptional so that its slow down could mean that the economy was adjusting to its potential growth rate. Hence, in terms of growth performance, there was no obvious symptoms telling that there was something fundamentally wrong with the economy. In fact, many commentators on the Asian crisis seem to agree this type of interpretation. From a longer term view, the Asian economies including Korea maintained high growth path in general, albeit noting many problems, especially of institutional deficiency, within the economies.

Ichimura *et. al.* (1998) give a different interpretation that the Korea economy had been going through a growth cycle over this period. In particular, they pay attention to exceptionally high growth rates of the late 1980s. This means that the economy was in a state of 'bubble' and sooner or later it would have experienced a downturn, say, in the mid-1990s. In spite of this elongated but unsustainable boom, however, the government pursued high growth policy by providing domestic stimulus and by borrowing from abroad.

On the other hand, Chang (1998) claims that most foreign borrowings by Korea have financed investments in tradable sector rather than real estate developments or imports of consumer goods. But, even if it was not a speculative bubble, more than 20% investment growth rate in the late 1980s in the manufacturing sector would be viewed as abnormal. The dramatic fluctuations of growth rates of output and investment from period to period are the symptoms of instability.

Profitability in Trouble

Behind these big swings in the growth performance, the 'real' sector went through deteriorating efficiency. As shown in Chart 1, the rate of profit (or the rate of return on fixed capital) of manufacturing peaked around the mid-1980s and afterward continuously declined throughout the late 1980s and the 1990s.³ The net profit rate declined from 20.8% in 1987 to 8.5% in 1996 and the gross rate from 16.2% to 9.0% (Table 2). Once it began to decline from 1987, its downward trend extended for a decade until the 1997 crisis. Though it recovered slightly in the early 1990s, it remained more or less at the same level and again declined even further. Manufacturing profitability during the period prior to the crisis was even lower than the level in 1980 when the Korean economy had a negative growth rate.

This long term decline of profitability indicates the fact that the return on investments in the Korean economy had been continuously deteriorating at an alarming

³ Coincidentally, the profit rate trend matches to change of successive administrations; the Chun Doo Hwan government for 1980-87, the Roh Tae Woo government for 1988-1992, and the Kim Young Sam government for 1993-1997.

pace for a decade and reached to the record low level before the crisis. It also implies that the interpretation that there was nothing fundamentally wrong in terms of growth performance should be re-examined.

We can find another interesting pattern in view of the relationship between profitability and investment. The trends of profitability and investment had moved together until the early 1990s. However, this pattern of similar development between profitability and investments appears to be dislodged during the early 1990s. (See Chart 6) For example, during 1980-87, when the manufacturing profit rate recovered significantly, the average growth rate of investment was 15.5% (see Table 3, memorandum item). But, if we divide the 1987-96 period into two sub-periods between 1987-92 and 1992-96, their relationship appears to be mixed. First, during 1987-92, when the profit rate declined, the investment growth rate dropped to mere 7.0%. But during 1992-96, in spite of a low profit rate or a further decline, the investment growth rate rose sharply to 16.3%.

From these observations, two points can be made. First, the fact that for a decade leading to the crisis, the continuous downward trend in outputs and investments accompanied fast deterioration in profitability indicates that the crisis originated from the supply side and was not merely an isolated blip of the flawed financial system. Also, it should be noted that this is the period that began to dismantle the traditional industrial policy framework, which had purported industrialisation in Korea for decades.⁴ Second, an exceptionally high investment growth rate in the early 1990s in spite of deteriorating profitability may have an implication on government policy, especially of financial

⁴ For an account of dismantling of industrial policy in Korea from the late 1980s, see Chang *et. al.* (1998).

liberalisation implemented in a big bang manner. We will return to these points later.

Profit Squeeze or Capital Productivity?

In order to investigate the underlying trend of profitability, the rate of profit is decomposed into two main components, profit share and output-capital ratio (see Appendix for decomposition). The manufacturing profit share trend shows a similar pattern as the profit rate, but only differs for the early 1990s (Chart 2). The net share reached the peak of 33.6% in 1986 and dropped to 21.9% in 1996. While it recovered substantially in the early 1990s rising to 31.3% in 1995, it declined once again to 24.2% in 1996.

This evolving pattern of the profit share seems to confirm the popular belief in Korea that the economy suffered from high input cost, especially in wages, from the late 1980s.⁵ When the country was democratised in 1987, trade union movements surged and some large scale industrial disputes followed. Often, the blame went to workers' 'excessive' wage demand, but it needs a closer scrutiny. The profit squeeze contributed to fall in the profit rate and its subsequent recovery in the early 1990s helped to delay further decline. But from the late 1980s, the main driving force behind the profit rate trend was the output-capital ratio.

As shown in Chart 3, the output-capital ratio rose by average 33% per year from 0.48 in 1980 to 0.64 in 1987. The improvement of the output-capital ratio in this period

⁵ For example, nominal wages rose by 20-30% in 1987 and 1988 after political democratisation. Some blamed the workers to have behaved irresponsibly under democracy. As will be discussed, the wage rates rose in parallel with productivity growth.

had been geared by series of wide ranging industrial reorganisation programmes in the early 1980s, which were implemented to sort out the hanger-over problems of over-capacity and over-lapping investments of the heavy and chemical industrialisation (henceforth HCI) in the 1970s.⁶ But then since 1987, its trend was curbed and began to decline rapidly by almost half of the 1987 peak level to 0.35 in 1996. The fall in the output-capital ratio thus was larger than the profit squeeze. As mentioned above, this evolving patter of deteriorating capital productivity corresponded to the demise of the industrial policy regime in Korea. Though maintained a stable trend in the early 1990s, capital productivity never recovered and declined further until the crisis.

4. DECOMPOSITION OF CONTRIBUTING FACTORS

In order to investigate to what extent labour and capital productivity, and wages affect the growth process, profit share and output-capital ratio are decomposed into several contributing factors. Table 3 lists the average rates of change of the contributing factors for the subsequent periods. In the period of 1980-87, rise of the profit rate was due almost equally to the improvement of both the profit share and the output-capital ratio. In that, all contributing factors show significant improvement; labour productivity growth was faster than wage rise (item 4 and 5), capital consumption cost was lessened (item 6 and 9), and capital productivity rose (item 8).

These positive trends were curbed dramatically in the pre-crisis period of 1987-96. While both of the two main factors declined significantly, fall in the output-capital ratio

⁶ For the explanation, see Jang (1995).

by -6.4% point p.a. was twice as much as the fall in the profit share by -3.2% point. An interesting point here is that labour productivity growth was still faster than wage rise for the period as a whole. The main pressure on profit squeeze came from rising capital consumption cost (item 6), which was incurred by larger depreciation allowance due to fast growth of investments in the late 1980s. This heavy burden from the capital consumption cost also had a negative impact on the output-capital ratio. Together with deteriorating relative price of output to capital price, it contributed to the decline in capital cost (item 9) by -2.9% point. However, the main cause of deteriorating output-capital ratio was a fall in capital productivity by -3.7% point on average (item 8).

On the other hand, there was a brief moment of profitability recovery in the early 1990s. In order to examine the underlying trend, the pre-crisis period is broken down into two sub-periods of 1987-92 and 1992-96. For the 1987-92 period, the profit rate was plummeting by -15.5% point, while it was slower by only -1.1% point in the 1992-96 period. In the former period, both the profit share (-7.6%) and the output-capital ratio (-8.6%) contributed to falling profitability, but the extent was greater in the latter. As for the profit share, although the growth rate of product wages (9.7%) was slightly higher than that of labour productivity (8.9%), the main element of profit squeeze was capital consumption cost (-2.2%).

The late 1980s is often said to be the period of wage explosion in Korea. But as confirmed in the Table 3, a rapid wage rise was almost compensated by labour productivity growth on an equivalent scale. Also as shown in Chart 4, wage rise had been more or less in parallel with labour productivity growth. In other words, the root of worsening competitive edge was not in the wage demand but in the loss of capital efficiency. In the latter period, labour productivity maintained its growth trend from the

former period but the rise of wages was considerably slower. As a result, the profit share rose by 2.6% on average in spite of still rising capital consumption cost by 1.6%. But it was not large enough to raise the profit rate because of still declining output-capital ratio by -3.6%, although deterioration in capital productivity slowed down.

Here, we can notice the prime difference in the driving forces behind profitability changes between the 1980-87 period and 1987-96 period. The prime factor responsible for profitability erosion in the pre-crisis period was capital productivity deterioration. Also, heavy capital consumption cost was due to capital productivity slow down.⁷

5. DECLINING INVESTMENT EFFICIENCY

Then, why did capital productivity decline? Here, we need to look at capital productivity in relation to other variables including labour productivity and mechanisation. The equation below shows the relationship among three variables of capital productivity, labour productivity and capital-labour ratio.

$$\frac{Y}{K} = \frac{Y}{L} \cdot \frac{L}{K}$$

And writing this expression in approximate proportionate rate of change form

⁷ Capital consumption cost means the proportion of capital depreciation in case of net capital stock and capital retirement in case of gross capital stock to output. Hence capital consumption cost is closely related to capital productivity. Unless output growth is in parallel with capital accumulation, which means that capital productivity is maintained at a constant level, the cost of capital consumption begins to rise in flowing years depending on the life span of capitals.

$(\dot{x} = x^{-1} dx / dt)$ gives:

$$\left(\frac{\dot{Y}}{\dot{K}}\right) = \left(\frac{\dot{Y}}{\dot{L}}\right) - \left(\frac{\dot{K}}{\dot{L}}\right)$$

The implication of the above equation is that capital productivity depends on the balance between labour productivity and capital-labour ratio (or mechanisation). In other words, if embodying an additional capital per unit of labour raises labour productivity as much, then capital productivity remains constant. Here, the net effect of change in these variables on profitability hinges on wage growth rate. For example, suppose that rise in the capital-labour ratio does not raise labour productivity as much, and as a consequence, capital productivity falls. There is, however, still a room for mechanisation without deteriorating profitability as long as the difference of growth rates between labour productivity and wages is greater than the fall in capital productivity. That may be the reason why profitability trend shows a kind of cyclical movement depending on the paces of labour and capital productivity growth, wages and mechanisation.

Among these variables, there is a chain effect interacting each other. Suppose wages rise fast so that employers might attempt to reduce input cost by accelerating mechanisation process replacing labour by machines. Then, producer's profitability depends on, first, whether labour productivity rise resulting from mechanisation is still greater than wage rise and, second, whether capital productivity does not deteriorate or remains constant. Even if gain from the gap between labour productivity and wage rise is positive, producer is still loosing profits in case that the gain is less than the loss from falling capital productivity. For this reason, capital productivity has a particular

importance in evaluating investment efficiency.⁸

Chart 5 illustrates changes in these variables for successive periods. In the early 1970s, capital productivity remained constant because the growth rate of capital-labour ratio was more or less same as that of labour productivity. But in the late 1970s, capital productivity plunged by on average –11.0% because the labour productivity growth by 8.0% was far slower than an enormously high growth rate of capital-labour ratio by 21.4%. This is primarily due to the HCI in the 1970s. From this evidence, we could derive certain characteristics of the HCI. The then Park Jung Hee government launched a series of investment programmes focussing on heavy and chemical industries. With little consideration on efficiency and market prospect, the government drove massive investments on selective industries sometimes by forced measures, which brought about a crisis in 1980 followed by sluggish growth in the early 1980s. This is an earlier example of how massive investment drive without efficiency and profitability consideration can bring about disastrous results.

Then, a similar phenomenon happened in the pre-crisis period. In the late 1980s, the investment spree by an average of over 20% growth rate per year resulted in the fast decline of capital productivity. In spite of a rapid pace of mechanisation, the labour productivity growth did not follow its pace. This implies that in spite of, or regardless of, declining investment efficiency, the investment spree continued throughout the pre-crisis period. Chart 6 shows overlapping the trends of the profit rate and the investment growth rate. Generally the investment growth rate shows a similar pattern to the profitability

⁸ Usually, capital productivity in advanced economies maintains constancy or shows a slow decline over a long-term.

trend.⁹ The late 1980s' trend, however, was out of track in a sense that in spite of fast declining profit rate, the investment growth rates did not decline significantly. There was a brief pause in 1992-93. When the profitability plunged to a record low level in 1992-93, then the investment growth rates dropped to -11.7% and -3.1%. But it resumed at an unusually high level again by 32.7% in 1994 and 29.3% in 1995.

6. INDUSTRIAL POLICY, CRONYISM AND MORAL HAZARD

Then, the question is, why did this investment drive continue in spite of deteriorating profitability and investment efficiency? The prime difference between the HCI period and the pre-crisis period lies in the different nature of the industrial policy. As well known, the essence of the so-called Korean 'miracle' is the state-led industrialisation employing active and wide-ranging industrial policies. Also, it is well acknowledged that massive investment drive such as the HCI was possible due to provision of various incentives and privileges as well as guarantees and bail outs. Often, only such lenient aspects of the industrial policy draw attention and they are said to be the causes of all malaise, such as moral hazard, corruption or cronyism. Then, was reckless investment drive in the pre-crisis period due to these characteristics of the industrial policy as happened in the 1970s?

Transformation of Industrial Policy Regime

⁹ Some recent econometric tests indicate that there is a strong correlation between profitability and investment growth. See Glyn (1997), Blanchard *et. al.* (1993) and OECD (1987)

It should be noted that firms in return for privileges had to comply with disciplinary measures from the government, ranging from entry restriction, investment coordination, performance screening and capacity adjustment to R&D investment, technological upgrade, and even forced merger and closure, when necessary. And when the economy was in trouble, the government never hesitated to activate these disciplinary measures. The stabilisation policy in the early 1970s and the industrial reorganisation programmes in the early 1980s were notable examples. Though Korea was not immune from ill-effects of the industrial policy, these disciplinary measures at least acted as an antidote against them. This privilege-disciplinary regime of the industrial policy had been a pillar of the 'high-investment-high-growth', or to borrow Krugman's term, 'input-driven' industrialisation.

Such privilege-disciplinary mechanism was, though constantly giving pressure at the micro level, not always put in action. Rather, there were big swings depending on the pace of industrialisation. As noted earlier, the 1970s was a period during which the government provided various incentives and subsidies to push forward the HCI. However, when the HCI strategy met severe efficiency problem, the above mentioned disciplinary measures were widely utilised against failing firms. The effect of such measures can be gauged from Chart 4. Due to the reorganisation programmes, labour productivity was still rising by almost 7% even with minimal infusion of capital per worker by 3% and consequently capital productivity rose significantly by almost 4%. This means that the reorganisation programmes employing disciplinary measures including closure, forced merger, capacity adjustment, etc. improved investment efficiency considerably.

From the late 1980s, however, there was a gradual but conspicuous transformation in the privilege-disciplinary regime of industrial policy. The sweeping democratisation

process in Korea from 1987 did not stop at politics alone but spread to other fields, especially the economy. Proclaiming to embrace the neo-Liberal ideology, already over-grown chaebols hankered for greater freedom in their businesses. Also, old sins of the successive authoritarian regimes provided the moral grounds for themes like liberalisation, privatisation and deregulation. In this unstoppable wave of neo-Liberalism, the traditional Korean industrial policy framework began to wane under the Roh Tae Woo government.¹⁰

The successive Kim Young Sam government pledged an unambiguous support for neo-Liberal policy of free market, which meant abandoning of the traditional industrial policy.¹¹ For example, the government abolished the practice of the ‘Five-year Planning’ and the planning ministry, the Economic Planning Board (EPB) was replaced by the Ministry of Finance and Economy that was merged with the Ministry of Finance.

But during these periods the exit from the industrial policy progressed in an unsymmetrical manner. While most disciplinary measures were abolished or were not activated in the midst of deregulation wave, preferential treatments and provisions remained still in place. Even as the formal and institutional framework of the famous state-business relationship was relinquished, the informal and personal connections were still in tact. In particular, chaebols which had accumulated influence over politics actively utilised their informal channels within the regime.

Hence, privileges without discipline brought about a fundamental transformation of

¹⁰ For example, the first official incident of waning industrial policy was virtual abandoning of the IDL (Industrial Development Law implemented in 1986) in 1989. But even before that, the then Roh Tae Woo government had little exercised disciplinary measures. See Chang (1998).

¹¹ See ‘100-day Plan for the New Economy’, which was the first economic statement of the Kim Young Sam government.

the industrial policy regime in Korea. The most important change in this respect was abandoning of the role of the government in investment coordination. The government refused to coordinate investment competition even in case of obvious over-capacity such as in the petrochemical industry in 1989. Also the government did not sought to discipline firms for poor performance while bailing them out through loan roll-overs until they eventually ended up with spectacular bankruptcy on a massive scale. On top of this, remaining provisions, especially credit allocation through the government controlled financial institutions, encouraged investment spree.

Corporate Governance

On the other hand, when state interventions, especially disciplinary measures, faded away, there was virtually no institutional framework to guide them through market functions. For instance, when the government did not intervene in investment coordination, there were no mechanisms to scrutinise investment decisions. Since no proper corporate governance system existed, there was virtually no room for stakeholders to exercise their rights. Moreover, the lack of transparency provided little information on the state of management. All decisions were made solely by the so-called ‘honourable’ chairmen of chaebols, who have no legal bindings either. The examples of private corporate sector profligacy include mutual payment guarantees among the member firms of the same chaebol, illegal inside trading, illegal diversion of investment funds within a chaebol group and so on. Some claim that Korea’s ‘pathological corporate governance’

had been the basis for ‘high corporate gearing’¹² including swift shift of business lines, patient investments with long-term digestion, and ambitious investments with large sunk cost. However, with neither government discipline nor market discipline, chaebols now had virtually free hand. Hence, instead of high corporate gearing, chaebols’ investment spree was little short of reckless behaviour.

A final open invitation for chaebols’ reckless investments was the whole scale financial liberalisation from 1993 under the Kim Young Sam government. A principal difference between the 1980s financial liberalisation including privatisation of some government owned banks and the 1990s financial liberalisation was that the former was proceeded in a cautious and slow manner in terms of order and speed and the system remained tightly controlled until the early 1990s.¹³ The latter, however, was a ‘big bang’ style measure but without any preparation of prudential regulations and supervision.

A poisonous mixture among the liberalisation measures was to liberalise the ‘secondary’ financial market of the non-bank financial institutions (NBFI) and to provide them licenses to deal with international finance. Most NBFIs were inexperienced with no modern banking techniques let alone international financing and operated based on the rule of thumb.¹⁴ In particular, the merchant bankers, who were previously private money launderers, became a front runner in borrowing foreign loans to exploit the interest rate gap between the domestic and the international market with little consideration for creditworthiness of domestic borrowers.

Rapidly mounting foreign debts were serious enough, but more serious problems

¹² Chang *et. al.* (1998)

¹³ Park (1996)

¹⁴ Dornbusch once described the Korean financial institutions as no more than money depositor.

were their maturity structure and credit management. Of the total foreign debts amounting to \$159 billion as of November 1997, the proportion of short term loans with less than a year's maturity was an astonishing 58.3%. Moreover a large proportion of these short term loans were invested into 3-5 years long term projects expecting near automatic roll over by foreign creditors. The seriousness of poor credit management of the Korean financial institutions resulted in a near collapse of the whole banking system before the crisis. An official report on the proportion of non-performing loans to total liabilities was 6.0% in 1997, which is already considerably higher than other countries. But a study claims that even this figure is a greatly underestimated one due to the lax classification of non-performing loans in Korea. If the international standard is applied, that figure rises to an astonishing 22.7%. (Lee and Kim, 1999) This fact clearly proves reckless credit management and investment behaviour during the pre-crisis period.

A more serious problem was that these NBFIs with greater freedom became nothing but a private pocket of chaebols. After the limit on equity holdings of NBFIs was abolished, 140 out of total 314 major NBFIs are controlled by 70 biggest chaebols and over 30% of them are owned by top 5 chaebols in 1997. This is one of the reasons why the debt-equity ratio of Korean firms is much higher than other countries.¹⁵ That figure was 450% for 30 biggest chaebols. A piece of evidence that the main role of the NBFIs owned by chaebols was to raise funds for chaebols is reported by a study that the ROA of those NBFIs was considerably and consistently lower than that of other non-chaebol owned

¹⁵ **International Comparison of the Debt-Equity Ratio of Firm**

Korea	U.S.A.	Japan	Taiwan
339.8.1%	159.7%	206.7%	85.7%

Note; 1997 for Korea and 1995 for other countries

NBFIs.¹⁶ With the lack of government supervision, prudential regulations and transparency, chaebols abused the system. Now there began to emerge various incidents of moral hazard in a genuine sense.

Under this circumstance, many firms, especially chaebols, devoured any available credit resources as if they were free for all. This resulted in rapidly falling investment efficiency and ended with the crisis. During the period leading to the crisis, a series of large scale bankruptcy followed. Between 1990 and 1996, three of 30 biggest chaebols went bankrupt, and in 1997 alone, 11 more chaebols went bankrupt. Considering the fact that bankruptcy is the final step of oblivion of firm and these cases of large scale bankruptcy, one can imagine the extent of poor management of the Korean corporate sector. Even when the government noticed widespread serious problems of investment failures by chaebols, it not only rolled over their astronomically mounting loans but also provides further credits. The government just lingered on the hope that their business might get better, which ended with a serious of spectacular bankruptcies of large chaebols and eventually the crisis.

7. CONCLUDING REMARKS: IMPLICATIONS ON REFORM

Different interpretations lead to different policy diagnoses. In case of the Asian crisis, however, since the thread connecting each interpretation is weak, policy recommendations cover almost every possible item that each theory offers. It is what many international organisations and country doctors ask the crisis inflicted Asian

¹⁶ Kim (1999)

countries. For example, the letters of intent between IMF or World Bank and the subjected countries include a wide range of comprehensive issues to the extent what my need to build a new country system. The problem is lies in that reform itself, by definition, is formidable task even for limited areas. Hence, identifying the causes and the mechanism leading to crisis is to provide a framework for the reform policy. Based on that, it is necessary to focus on selective areas of reform.

In assessing the aftermath of the crisis, many factors have suggested as a cause of the crisis. In particular, more direct policy mistakes have drawn wider attentions. Such as, overvaluation of won was maintained for an extended period in spite of increasing trade deficits. Ill-managed exchange rate policy surely exacerbated the situation that the government gave every indication of maintaining high *won* policy, which in turn precipitated short term capital inflow because investors, domestic or foreign, expected a little prospect of a loss from devaluation.

The explanations on the flawed financial system, again domestic and international, stand up under close scrutiny. The pace and method of liberalisation of the domestic financial markets had been seriously misplaced. A full blown liberalisation in the absence of regulation and supervision exposed the economy in the volatile international finance market. In a sense, Korea became the victim of its own confidence. Based on past performance, there was virtually no one who seriously doubted its prospect in the future. A part of blame went to foreign creditors too, who neither checked creditworthiness and profitability, nor impose stringent conditions.

The list can go on. These explanations, however, have a serious weakness. Unless investigating the underlying performance of the economy, they are unable to offer fundamental remedies. Suppose that the government had pursued a reasonably sound

exchange rate policy. Then, was the Korean economy able to avoid the crisis? Suppose that there were proper regulations on short term capital movements. Then, was the Korean economy still able to avoid it? All those measures might help to bypass a disastrous catastrophe, but it still would have paid prices for failing investments in a way or another, if not in an abrupt crisis.

This study suggests that the falling capital productivity and profitability for an extended period were the underlying cause of the crisis. It is difficult to claim that they were the direct cause of the crisis. But the Korean economy was certainly under serious stress. The mixture of ill-managed exchange rate policy, ill-prepared financial liberalisation and ill-designed financial institutions might have triggered the crisis.

In spite of obvious symptoms of deterioration of investment efficiency, the investment drive did not slow down because institutional framework to scrutinise corporate behaviour was absent. Contrary to a popular assumption that the industrial policy and the close state-business relationship were the root of moral hazard and cronyism, the dismantling of the privilege-disciplinary regime of industrial policy from the late 1980s was primarily responsible for corporate sector profligacy. These phenomena were extended to the financial sector due to the financial liberalisation measures without supervisory and prudential systems in the early 1990s.

Then, for the future lesson, the essence of reform policy in Korea should be the question on, among others, how to discipline corporate behaviour. Two options can be suggested. First, the traditional type of industrial policy can be re-deployed as an instrument for corporate discipline. Some still claim such solution. But taking the changing state-business relationship in recent years in Korea into account, returning to the old hay day of such an industrial policy regime would not be feasible.

Second, a market approach type of solution can be suggested. Autonomous market functions could be utilised to screen corporate behaviour. Allowing wider autonomy with proper institutional settings for self-screening system may be a more appropriate solution. Allowing greater freedom of market activities is easier than institutional settings, because institutional reforms inevitably involve fundamental changes of the relationship among the vested interest groups of society. In other words, reform becomes less of an economic but more of a political matter.

Since the inauguration of the Kim Dae Jung administration, the Korean government has initiated the economic reforms on four areas: 1) financial reform, 2) chaebol reform, 3) labour reform and 4) public sector reform. Among these four, the government in particular focuses on the first two issues. Up to this point, many outside observers agree that the financial reform has been more or less successful. Its final outcome, however, depends upon the chaebol reform. Its main content is to upgrade accountability of corporate managers, transparency of managerial affairs, and fairness of competition. The measures include, among others, the banning of mutual payment guarantees, the demand for the publication of consolidated balance sheets within a chaebol group, the strengthening of minority shareholders' rights. In short, chaebols are now required to satisfy the internationally acknowledged minimum standard of corporate governance. During the last two years of the reform process, chaebols have resisted and sometimes backfired many reform measures and the government is not in the best position politically to push for further reforms on chaebols. From a long term perspective, however, it would be difficult to turn back the course of reform.

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Table 1. Growth Performance

(average % growth per annum)

	GDP Growth Rate		Investment Growth Rate	
	Whole Economy	Manufacturing	Whole Economy	Manufacturing
80-85	8.1%	11.0%	7.5%	9.9%
85-90	10.0%	13.2%	16.5%	20.8%
90-96	7.4%	8.0%	7.8%	8.1%

Source: Korea Statistical Yearbook, various issues**Table 2. Profitability Trends, 1980-96**

	Profit Rate		Profit Share		Output-Capital Ratio	
	Gross	Net	Gross	Net	Gross	Net
1980	13.1%	10.8%	31.0%	22.5%	0.423	0.481
1987	16.2%	20.8%	35.3%	32.5%	0.459	0.639
1996	9.0%	8.5%	32.3%	24.2%	0.279	0.353

Source: Data Appendix

Table 3. Manufacturing Profit Rate Decomposition

(average % change per annum)

		80-87	87-96	87-92	92-96
(1) Profit Rate=(2)+(7)	(+)	9.7%	-9.4%	-15.5%	-1.1%
(2) Profit Share		5.4%	-3.2%	-7.6%	2.6%
(3) Wage Share=(4)-(5)-(6)	(-)	-1.9%	1.3%	3.0%	-0.8%
(4) Product wage	(-)	6.0%	8.3%	9.7%	6.6%
(5) Labour Productivity	(+)	6.9%	9.0%	8.9%	9.1%
(6) Input Cost	(+)	1.2%	-1.9%	-2.2%	-1.6%
(7) Output-Capital Ratio=(8)+(9)	(+)	4.1%	-6.4%	-8.6%	-3.6%
(8) Real Output-Capital Ratio	(+)	3.7%	-3.7%	-5.3%	-1.6%
(9) Capital Cost Effect=(10)+(11)	(+)	0.5%	-2.9%	-3.5%	-2.1%
(10) Relative Price Effect	(+)	-0.7%	-1.0%	-1.3%	-0.5%
(11) Capital Consumption Effect	(+)	1.2%	-1.9%	-2.2%	-1.6%
* Memorandum Items					
Investment Growth Rate		15.5%	11.0%	7.0%	16.3%
Output Growth Rate		13.4%	8.4%	8.3%	8.4%
Employment Growth Rate		5.8%	0.6%	1.5%	-0.5%
Working Hours Change		0.2%	-1.2%	-2.0%	-0.2%
Output Price Change		4.5%	3.7%	4.9%	2.3%
Capital Stock Price Change		5.2%	4.7%	6.3%	2.8%

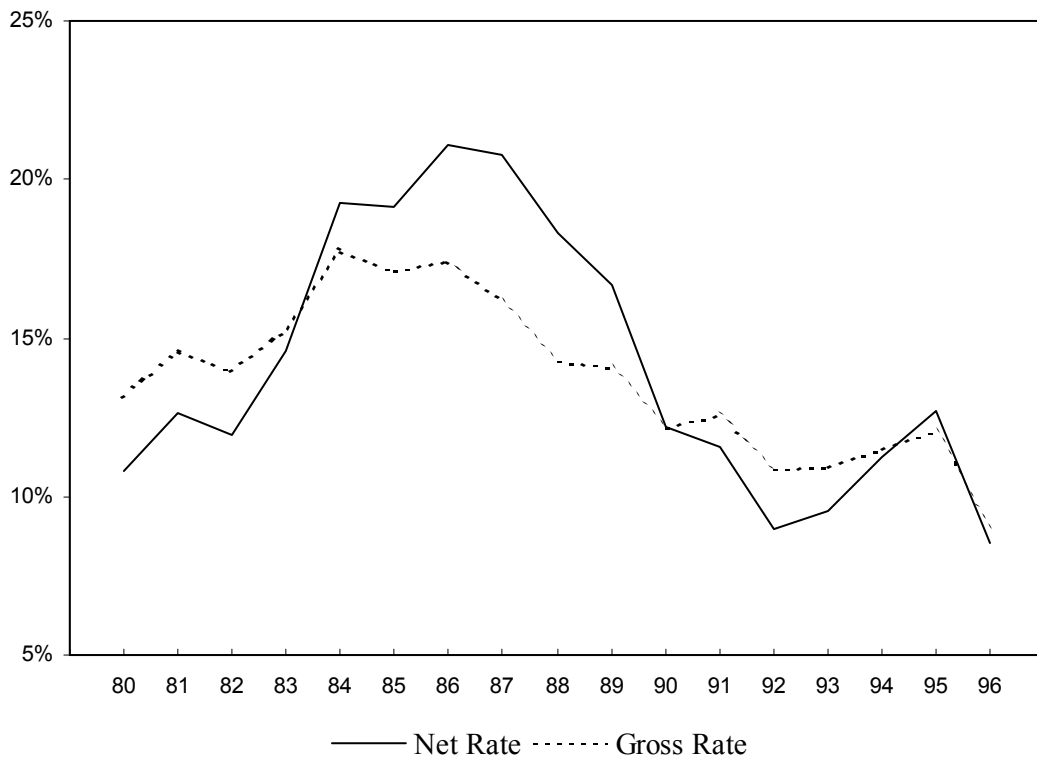
Source: Appendix Data

Note: for the detailed explanation on the measurement, see Appendix on the Decomposition of the Rate of Profit.

- (1) Net profit rate; net profit divided by net fixed capital stock at current prices.
- (2) Net profit share; net profit as % of net value added.
- (3) Compensation for employees (after imputed for unpaid workers) as % of net value added.
- (4) Hourly adjusted compensation for employees deflated by output prices.
- (5) Real value added per hour worked.
- (6) Capital consumption effect as % of value added net of depreciation to value added.
- (7) Net output divided by net fixed capital stock at current prices.
- (8) Output divided net capital stock at constant prices.

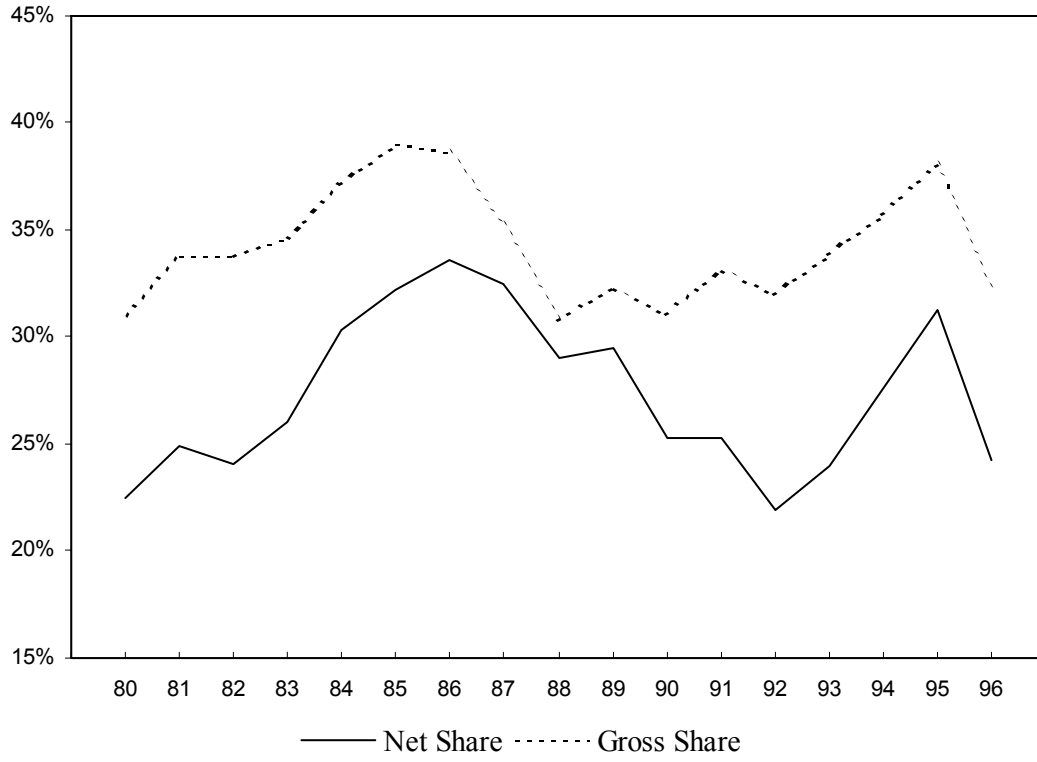
- (9) Capital consumption effect plus relative price effect (output to capital prices).
 - (10) Output to capital prices
 - (11) Capital consumption effect as % of value added net of depreciation to value added.
- * (+) and (-) signs mean the positive and negative effect on profit rate.

Chart 1. Profit Rate



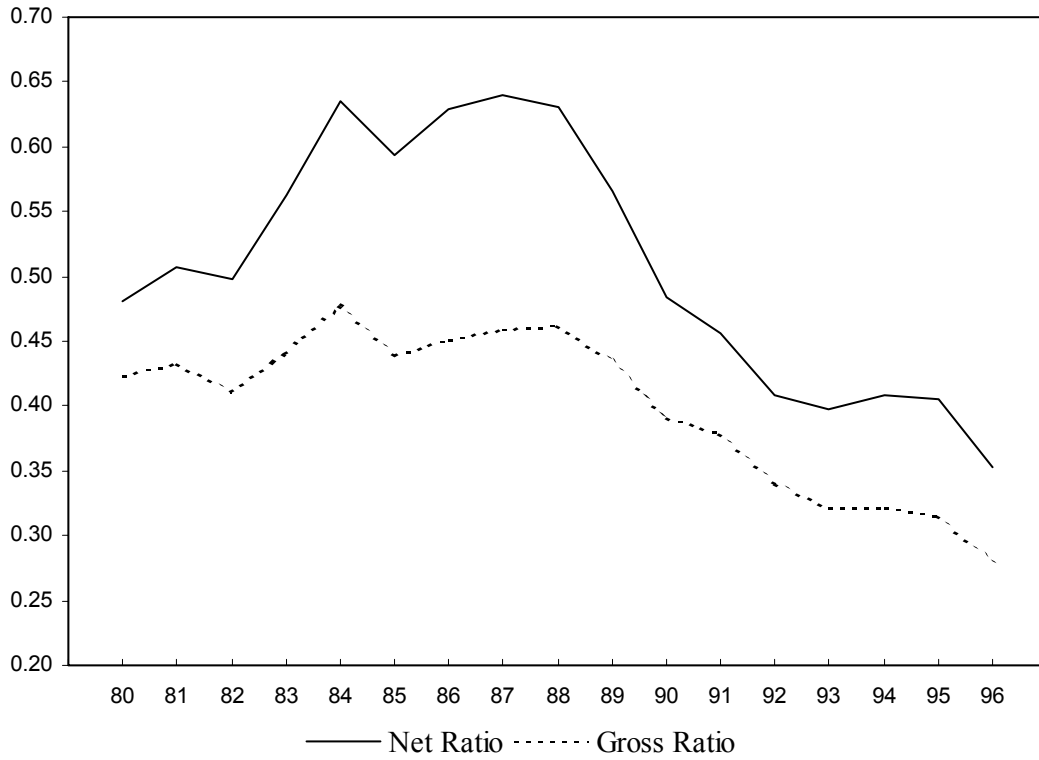
Note; manufacturing sector

Chart 2. Profit Share



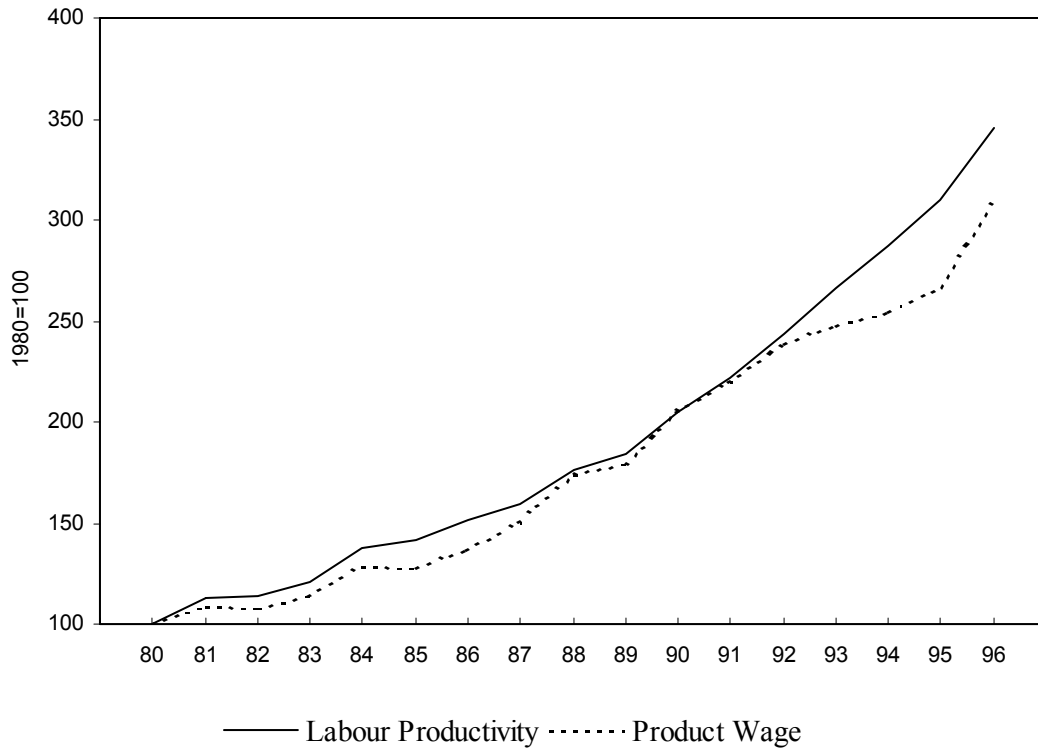
Note; manufacturing sector

Chart 3. Output-Capital Ratio



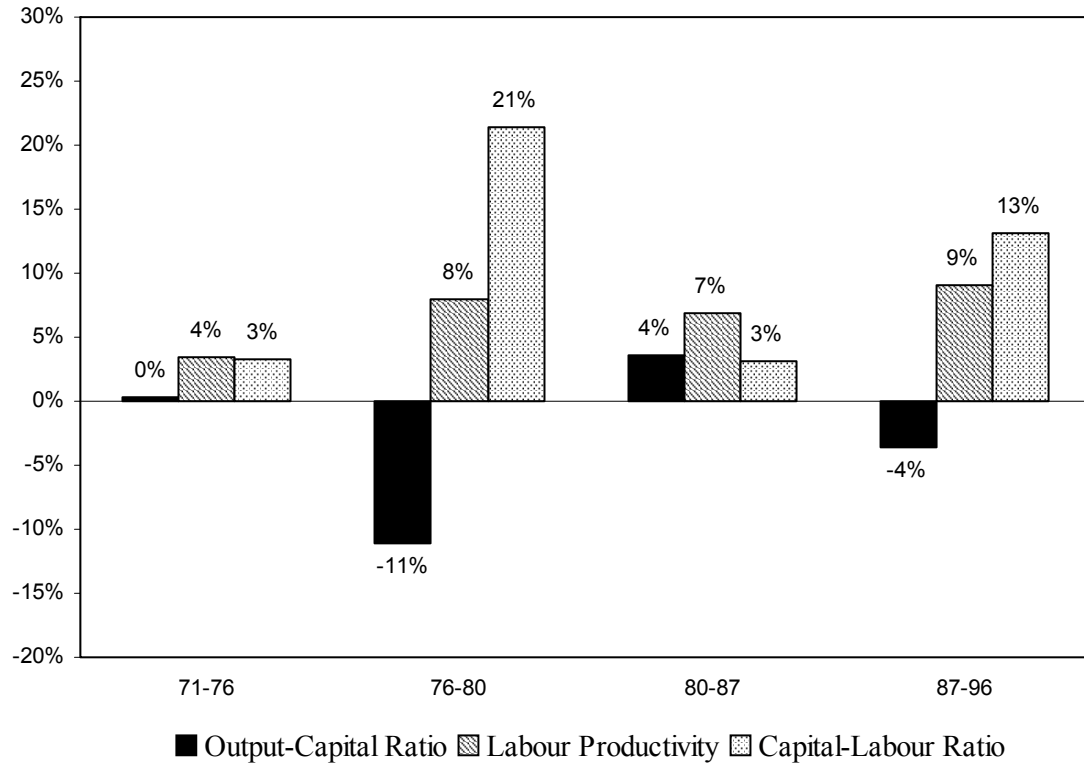
Note; manufacturing sector

Chart 4. Productivity and Wage Growth



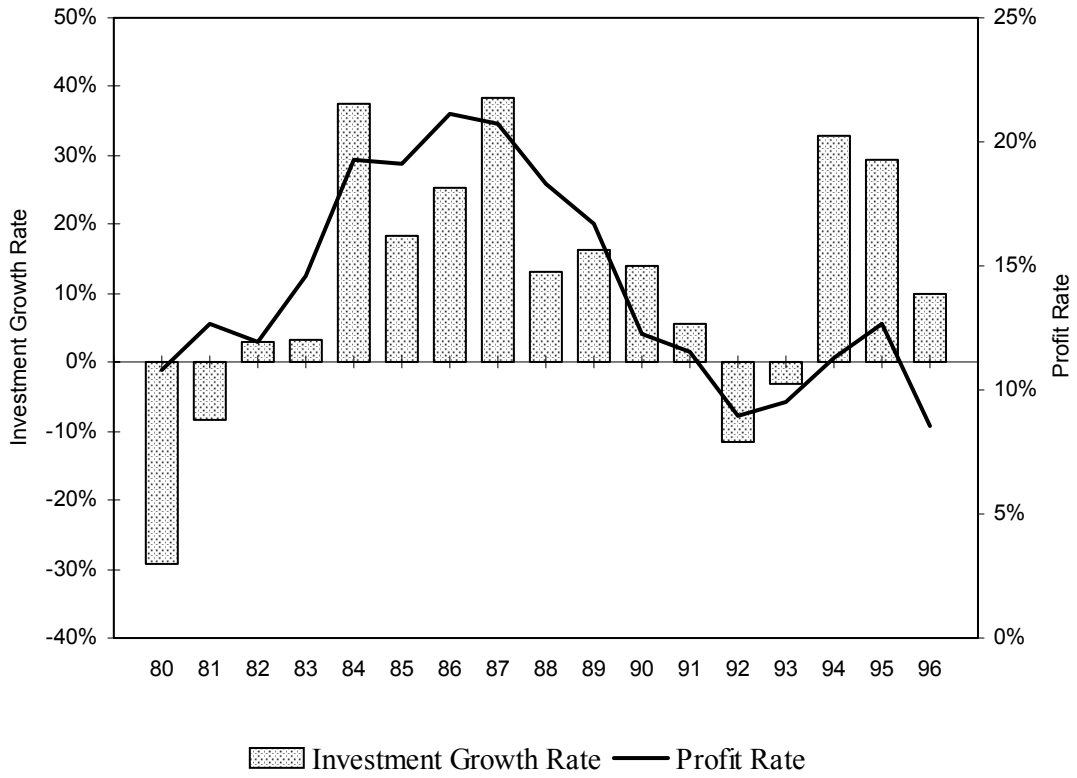
Note; adjusted by hours of work

Chart 5. Mechanisation and Productivity Growth



Note; adjusted by hours of work.

Chart 6. Investment and Profit Rate



APPENDIX. Decomposition of the Rate of Profit

The decomposition of the rate of profit provides a useful way to look at its trend.¹⁷

First, it can be decomposed into two main component, the profit share and the output-capital ratio,¹⁸ as:

$$\begin{aligned}\frac{\Pi_n}{K_n} &= \frac{\Pi_n}{Y_n} \cdot \frac{Y_n}{K_n} \\ &= \left(1 - \frac{W}{Y_n}\right) \cdot \frac{Y_n}{K_n}\end{aligned}$$

where $Y_n = (W + \Pi_n)$, Π_n is net profit, K_n is net capital stock at current prices, and Y_n is net value added at current prices. Writing this expression in approximate proportionate rate of change form ($\dot{x} = x^{-1} dx / dt$) gives:

$$\begin{aligned}\left(\frac{\dot{\Pi}_n}{K_n}\right) &= \left(\frac{\dot{\Pi}_n}{Y_n}\right) + \left(\frac{\dot{Y}_n}{K_n}\right) \\ &= -\frac{W}{\Pi_n} \cdot \left(\frac{\dot{W}_n}{Y_n}\right) + \left(\frac{\dot{Y}_n}{K_n}\right)\end{aligned}$$

Thus, the rate of change of the profit rate is the sum of the rate of change of profit share and the rate of change of the output-capital ratio. It is also expressed as the rate of change of the output-capital ratio minus the rate of change of the wage share weighted by the ratio of wages to profits. Then, first, the wage share can be further decomposed,¹⁹ as:

¹⁷The methodology involved in the measurement of the rate of profit has been as much controversial as the interpretation of actual measurement. In particular, there have been many controversies on whether the expression of the rate of profit by money term could represent the value term profit rate. However, Petrovic (1987) showed that there is little difference between them.

¹⁸Feinstein (1968) was the first one to use such decomposition systematically in empirical work.

¹⁹The first detailed decomposition was formulated by Weisskopf (1979) in order to investigate the effect of

$$\frac{W}{Y_n} = \frac{W}{L_h \cdot P_y} \cdot \frac{L_h \cdot P_y}{Y} \cdot \frac{Y}{Y_n}$$

where L_h is total employment (multiplied by total hours worked), Y is value added at current prices and P_y is output price index. Also, the proportionate rate of change form the wage share is:

$$\begin{aligned} \left(\frac{\dot{W}}{Y_n} \right) &= \left(\frac{\dot{W}}{L_h \cdot P_y} \right) - \left(\frac{\dot{Y}}{L_h \cdot P_y} \right) + \left(\frac{\dot{Y}}{Y_n} \right) \\ &= \left(\frac{\dot{w}_{py}}{L_h} \right) - \left(\frac{\dot{y}}{L_h} \right) + \left(\frac{\dot{Y}}{Y_n} \right) \\ &= \varpi_{py} - \delta_h + \varepsilon \end{aligned}$$

where w_{py} is total wages deflated by value added price index (product wages), y is value added at constant prices, ϖ_{py} is the growth rate of hourly product wages and δ_h is the growth rate of hourly labour productivity and ε is the rate of change of input cost. First, we need to explain ‘product wages’. The commonly used index for the growth rate of wages is the real wage growth rate deflated by the consumer price index. While real wages are concerned for workers, it is little concern for employers. For employers, the real cost of employing labour is more important so that it would be better to measure wages in terms of output prices, which is called ‘product wages’. Secondly, labour productivity is measured in terms of total hours worked. Thirdly, the input cost is the proportion of capital consumption in value added.

wage rate and labour productivity. The decomposition formula of this study employs the method developed by *Glyn et. al.* (1990).

The decomposition of the output-capital ratio is:

$$\frac{Y_n}{K_n} = \frac{y}{k_n} \cdot \frac{P_y}{P_k} \cdot \frac{Y}{Y_n}$$

$$\left(\frac{\dot{Y}_n}{\dot{K}_n}\right) = \left(\frac{\dot{y}}{\dot{k}_n}\right) + \left(\frac{\dot{P}_y}{\dot{P}_k}\right) + \left(\frac{\dot{Y}}{\dot{Y}_n}\right)$$

$$= \varphi + \mu$$

where P_k is the price index of net capital stock, φ is the rate of change of the real output-capital ratio at constant price, and μ is the rate of change of capital cost. The capital cost includes relative price of value added to capital stock prices and the weight of capital consumption. Thus, the rate of change of net output-capital ratio is the sum of the rate of change of the real output-capital ratio and the rate of change of capital cost. The estimation of the rate of profit and its contributing factors are given in Appendix.

DATA APPENDIX

A1. Manufacturing Gross Fixed Capital Stock

in billion won

	at current price		at 1990 constant price	
	Gross Fixed Capital Stock	Retirement	Gross Fixed Capital Stock	Retirement
1970	633.3	12.8	4934.8	89.2
1971	796.8	15.3	5863.7	99.5
1972	1001.1	20.5	6538.8	117.8
1973	1462.2	30.5	7887.1	139.2
1974	2413.2	54.6	9305.6	174.9
1975	3548.6	87.9	11218.4	228.1
1976	4520.1	117.3	13863.0	301.6
1977	6238.5	153.9	17721.8	372.7
1978	8992.6	189.7	23205.5	438.2
1979	13425.8	247.3	29185.6	502.7
1980	19934.3	355.0	33223.1	557.1

1981	24786.5	462.2	36784.8	645.3
1982	29168.1	581.0	40366.6	755.9
1983	33045.1	790.8	43853.7	986.1
1984	37135.9	1007.6	48744.3	1257.5
1985	44042.9	1421.4	54384.5	1643.0
1986	51901.8	2270.9	61066.5	2442.3
1987	60659.7	3553.4	69975.3	3714.9
1988	71662.6	4778.0	79377.2	4886.9
1989	83135.5	4915.8	90827.5	5161.9
1990	105135.4	4623.6	105135.4	4623.6
1991	130349.0	4387.1	120857.5	4277.8
1992	153074.7	4916.7	133889.7	4634.5
1993	170467.5	6192.0	145300.3	5703.6
1994	191556.1	7673.9	160959.9	7056.5
1995	224059.1	9484.5	181649.0	8681.2
1996	258124.2	11441.9	203572.7	10404.4

Note; Data presented here is author's own estimation. The methodology to estimate fixed capital stock is the perpetual inventory method using fixed capital formation statistics in the *National Account*. For the detailed explanations, see Jang (1995).

A2. Manufacturing Net Fixed Capital Stock

in billion won

	at current price		at 1990 constant price	
	Net Fixed Capital Stock	Depreciation	Net Fixed Capital Stock	Depreciation
1970	486.5	38.9	3838.9	280.3
1971	606.8	49.2	4537.5	329.9
1972	740.1	66.8	4935.2	395.1
1973	1078.1	92.9	5982.5	440.3
1974	1767.7	158.4	7045.5	530.5
1975	2618.5	227.7	8563.4	623.0
1976	3417.0	275.7	10761.6	748.0
1977	4849.7	363.5	14066.0	927.2
1978	7194.4	498.0	18792.0	1195.9
1979	10812.3	767.1	23679.7	1595.0
1980	15608.9	1278.8	26232.8	2041.4
1981	18671.8	1722.8	27997.7	2442.1
1982	21040.3	2126.2	29544.2	2791.3
1983	22878.5	2494.5	30880.0	3137.3
1984	25197.8	2757.1	33562.4	3465.7
1985	29306.9	3365.7	36914.6	3931.0
1986	34447.1	4065.5	41581.7	4457.3
1987	41736.5	4708.4	49134.7	5070.7
1988	51320.5	5609.3	57535.4	5888.0
1989	61412.1	6346.5	67401.7	6745.9
1990	78515.7	7817.5	78515.7	7817.5
1991	96841.0	9577.9	89320.5	9195.0
1992	111001.3	11667.6	96242.1	10745.2
1993	120134.3	13351.3	101352.1	12004.1
1994	133727.6	14610.2	111003.2	13065.0
1995	157534.5	16520.5	125810.3	14563.2
1996	182384.6	19074.1	141527.7	16610.7

Note; see A1.

A3. Manufacturing Gross and Net Profits

in billion won

	Gross Profits	Net Profits
1970	182.5	156.4
1971	199.2	165.4
1972	341.6	295.3
1973	492.8	430.4
1974	683.9	580.1
1975	932.2	792.4
1976	1312.2	1153.8
1977	1572.9	1363.3
1978	1876.1	1567.7
1979	2476.0	1956.3
1980	2613.4	1689.7
1981	3619.7	2359.1
1982	4062.8	2517.6
1983	5046.3	3342.7
1984	6596.7	4847.1
1985	7543.0	5598.6
1986	9061.7	7267.2
1987	9816.9	8661.9
1988	10218.9	9387.6
1989	11686.0	10255.3
1990	12788.0	9594.1
1991	16365.1	11174.3
1992	16678.6	9927.7
1993	18621.2	11461.9
1994	22003.9	15067.6
1995	26995.0	19959.1
1996	23217.1	15584.9

Note: profits include compensation for employees plus imputed wages for unpaid workers.

**A4. Manufacturing Gross Profit Rate, Profit Share,
Wage Share and Output-Capital Ratio**

	Profit Rate	Profit Share	Wage Share	Output-Capital Ratio
1970	28.8%	40.8%	59.2%	0.706
1971	25.0%	35.9%	64.1%	0.696
1972	34.1%	45.4%	54.6%	0.751
1973	33.7%	44.3%	55.7%	0.762
1974	28.3%	44.8%	55.2%	0.632
1975	26.3%	46.4%	53.6%	0.566
1976	29.0%	43.3%	56.7%	0.670
1977	25.2%	41.0%	59.0%	0.615
1978	20.9%	35.6%	64.4%	0.586
1979	18.4%	36.1%	63.9%	0.511
1980	13.1%	31.0%	69.0%	0.423
1981	14.6%	33.8%	66.2%	0.433
1982	13.9%	33.8%	66.2%	0.412
1983	15.3%	34.6%	65.4%	0.441
1984	17.8%	37.2%	62.8%	0.478
1985	17.1%	39.0%	61.0%	0.439
1986	17.5%	38.7%	61.3%	0.452
1987	16.2%	35.3%	64.7%	0.459
1988	14.3%	30.8%	69.2%	0.463
1989	14.1%	32.3%	67.7%	0.435
1990	12.2%	31.0%	69.0%	0.392
1991	12.6%	33.1%	66.9%	0.379
1992	10.9%	32.0%	68.0%	0.341
1993	10.9%	33.9%	66.1%	0.322
1994	11.5%	35.8%	64.2%	0.321
1995	12.0%	38.1%	61.9%	0.316
1996	9.0%	32.3%	67.7%	0.279

**A5. Manufacturing Net Profit Rate, Profit Share,
Wage Share and Output-Capital Ratio**

	Profit Rate	Profit Share	Wage Share	Output-Capital Ratio
1970	32.1%	37.2%	62.8%	0.865
1971	27.3%	31.8%	68.2%	0.858
1972	39.9%	41.8%	58.2%	0.954
1973	39.9%	40.9%	59.1%	0.975
1974	32.8%	40.8%	59.2%	0.804
1975	30.3%	42.4%	57.6%	0.714
1976	33.8%	40.2%	59.8%	0.840
1977	28.1%	37.6%	62.4%	0.748
1978	21.8%	31.6%	68.4%	0.689
1979	18.1%	30.9%	69.1%	0.586
1980	10.8%	22.5%	77.5%	0.481
1981	12.6%	24.9%	75.1%	0.507
1982	12.0%	24.1%	75.9%	0.498
1983	14.6%	26.0%	74.0%	0.562
1984	19.2%	30.3%	69.7%	0.635
1985	19.1%	32.2%	67.8%	0.594
1986	21.1%	33.6%	66.4%	0.628
1987	20.8%	32.5%	67.5%	0.639
1988	18.3%	29.0%	71.0%	0.630
1989	16.7%	29.5%	70.5%	0.566
1990	12.2%	25.2%	74.8%	0.484
1991	11.5%	25.3%	74.7%	0.457
1992	8.9%	21.9%	78.1%	0.409
1993	9.5%	24.0%	76.0%	0.397
1994	11.3%	27.6%	72.4%	0.408
1995	12.7%	31.3%	68.7%	0.405
1996	8.5%	24.2%	75.8%	0.353

A6. Manufacturing Wage Share Decomposition

1980=100

	Wage Share	Product Wages	Labour Productivity	(Yn/Y)Capital Consumption
1970	81.1	44.3	52.8	96.6
1971	88.0	56.1	61.8	96.9
1972	75.0	53.0	65.6	92.8
1973	76.2	59.0	69.6	89.8
1974	76.4	58.3	74.0	96.9
1975	74.3	56.0	75.1	99.7
1976	77.1	60.1	73.4	94.1
1977	80.5	69.5	80.5	93.2
1978	88.2	87.5	91.1	91.8
1979	89.2	92.2	98.7	95.4
1980	100.0	100.0	100.0	100.0
1981	96.9	108.9	112.7	100.3
1982	98.0	108.3	113.5	102.7
1983	95.5	113.5	120.4	101.3
1984	89.9	128.8	137.7	96.1
1985	87.5	127.9	141.3	96.7
1986	85.7	136.7	151.8	95.1
1987	87.1	150.5	159.3	92.2
1988	91.6	174.7	175.9	92.2
1989	90.9	179.4	183.7	93.1
1990	96.4	205.1	204.9	96.3
1991	96.4	219.7	221.7	97.3
1992	100.8	239.1	243.8	102.8
1993	98.1	247.3	266.5	105.7
1994	93.4	254.9	287.1	105.2
1995	88.7	266.0	310.1	103.4
1996	97.8	308.7	345.8	109.6

A7. Manufacturing Output-Capital Ratio Decomposition

1980=100

	Output-Capital Ratio	Real Output-Capital Ratio	Relative Price of P_y/P_k	(Y/Y_n)Capital Consumption
1970	179.8	156.8	110.8	103.5
1971	178.3	157.4	109.8	103.2
1972	198.2	165.0	111.5	107.7
1973	202.6	176.3	103.2	111.4
1974	167.1	175.5	92.3	103.2
1975	148.3	162.3	91.1	100.3
1976	174.5	159.6	102.9	106.2
1977	155.5	140.8	102.9	107.3
1978	143.2	128.8	102.2	108.9
1979	121.8	112.5	103.2	104.8
1980	100.0	100.0	100.0	100.0
1981	105.3	103.2	102.3	99.7
1982	103.4	104.6	101.5	97.4
1983	116.8	115.4	102.6	98.7
1984	131.9	124.1	102.2	104.0
1985	123.4	119.8	99.6	103.4
1986	130.6	127.1	97.7	105.1
1987	132.8	128.6	95.2	108.5
1988	131.0	124.9	96.7	108.4
1989	117.5	111.1	98.5	107.4
1990	100.6	104.7	92.5	103.8
1991	94.9	100.4	92.0	102.8
1992	84.9	97.9	89.2	97.3
1993	82.6	97.6	89.4	94.6
1994	84.8	98.4	90.6	95.0
1995	84.2	96.3	90.5	96.7
1996	73.3	91.9	87.3	91.3