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Post-Crisis Growth and Bankruptcy Policy Reform in Korea: Empirical Evidence

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**Post-Crisis Growth and Bankruptcy Policy
Reform in Korea: Empirical Evidence**

December 2002

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Foreword

Since the economic crisis in 1997, Korea has undertaken comprehensive structural reforms, including that in the corporate and financial sectors. To a large extent, the painful reforms were pushed forward based on the belief that these reforms were essential for regaining medium or long run growth momentum. However, it is not clear how these reforms are actually related to the post-crisis growth outcome of the Korean economy. What are the effects of such structural reforms on the medium or long run performance of the Korean economy after the crisis? Even though answering this question is not a direct goal of this study, it probably was the ultimate motivation.

First, this study aims to document stylized patterns of growth in countries which experienced banking crises. Specifically, this study addresses the following two issues. The first issue is whether there are any significant changes in growth associated with the banking crises. If the crises are not accompanied by the changes in medium or long term growth rates which go beyond the well-known short term economic contraction, then it might be pointless to discuss growth in relation to crises. Furthermore, in this case, it would be doubtful that post-crisis structural reforms play an important role in medium or long term growth performance of crisis-hit countries. The next issue is what role the total factor productivity growth (TFPG) plays in changes in growth, if any, over the banking crises. To address this issue, this paper accounts for the “changes in growth” before and after the banking crises. It is true that growth accounting by itself cannot pin down the exact policy measures which determine the post-crisis growth performance of crisis-hit countries. Nevertheless, growth accounting evidence could be useful in as much as it can narrow down the set of relevant policy measures. That is, the predominant role of TFPG, rather than the changes in the pace of input accumulation, in changes in growth over the crises might suggest that policy or institutional factors capable of explaining changes in medium or long term TFPG are important to post-crisis growth.

For this question, this study suggests that post-crisis growth performance of the Korean economy will, to a large extent, depend on the performance of total factor productivity relative to the pre-crisis period. Also, it is suggested that it is important to make policy or institutional environment favorable to the total factor productivity improvement, in order to strengthen the growth potential of the Korea economy.

Second, this paper starts from the observation that the Korean corporate bankruptcy system prior to the crisis had a tendency to work as a de facto exit barrier. For example, before the bankruptcy policy reform in Korea, the producers with persistently declining productivity were much likely to be accepted into some rehabilitation procedures if they were regarded as having “high social value,” such as a large output or employment share in the economy. It is suggested that bankruptcy policy reform and its consequences on the efficiency of resource reallocation might be a crucial element in understanding post-crisis growth in Korea.

Regarding the effect of the post-crisis bankruptcy policy reform on exit barriers, this paper shows the following point. After the post-crisis bankruptcy policy reform, the insolvent firms with persistent difficulties seem to be less likely to be accepted into the court-administered rehabilitation procedures. This finding is quite suggestive of the fact that the post-crisis bankruptcy policy reform contributed to enhancing the efficiency in resource reallocation process by helping to lessen the exit barriers in the Korean economy.

I believe that this work will benefit the scholars and policymakers who are interested in the post-crisis Korean economy. The authors thank Yonghoon Jung and Sookyung Lee for capable research assistance, and Chansoon Yim and Wonho Lee for their editorial work.

Choongsoo Kim
President
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Summary

The first part of this paper provides some empirical evidence on the patterns of growth in countries hit by the banking crisis. Specifically, we examine whether the banking crisis accompanies changes in medium or long term growth rates and, if so, whether the changes in growth are mainly driven by the changes in TFPG or by the changes in the pace of input accumulation. It is found that per worker GDP growth lacks persistency over the banking crises, suggesting that high-growth countries could become low-growth countries, and vice versa, as they go through the crises. Growth accounting exercise shows that the changes in growth are mainly driven by the changes in TFPG. This conclusion holds regardless of whether we view that the changes in capital stock are induced by the changes in total factor productivity or not. The implications are as follows. First, although predicting post-crisis growth based on pre-crisis growth might not be easy, it might be more fruitful to direct research efforts to understanding why TFPG changes, rather than why the pace of input accumulation changes, in order to understand post-crisis growth outcome. Second, the policies that are important in determining post-crisis growth outcome are likely to be the ones that can explain the changes in medium or long term TFPG. Viewed in this way, the findings of this paper seem at least consistent with the hypothesis that structural reforms matter in post-crisis growth.

The second part of the paper focuses on bankruptcy policy among the potentially important determinants of TFPG in Korea. Specifically, we attempt to examine empirically the effect of the post-crisis bankruptcy policy reform on the efficiency in resource allocation. In the analysis, we focus on the policy reform in the court-administered bankruptcy system. By using firm-level data, the paper shows that the post-crisis reform on the court-administered bankruptcy system made economic efficiency criterion replace social or political criterion in selecting target firms for rehabilitation procedures.

This kind of change in the way the court-administered bankruptcy system works has far-reaching consequences. It is because, for the pre-bankruptcy informal arrangements, one of the most effective disciplines comes from the discipline in the court-administered bankruptcy procedures. Except for the small-sized firms with simple capital structure, the court-administered bankruptcy procedures would be usually the last stages for ailing firms to resort to if the interested parties could not agree on the pre-bankruptcy informal arrangements for corporate restructuring. Therefore, in out-of-court administered settlements, the interested parties' incentives would be directly affected by the structure of court-administered bankruptcy settlements.

Although this paper focused exclusively on bankruptcy policy reform as one determinant of post-crisis TFPG performance, there might also be other important policies or institutional factors that are potentially important for understanding movements of TFPG. In this sense, it is still premature to make a bold prediction about post-crisis growth in Korea. With this caveat in mind, we believe one should not overlook the important changes in the area of bankruptcy policy after the crisis when projecting the future growth of the Korean economy. Lastly we should bear in mind that the full-fledged effect of the bankruptcy policy reform is likely to be realized over the longer run, in as much as the bankruptcy policy affects the dynamic efficiency of resource reallocation.

CHAPTER 1

Introduction

Since the outbreak of the financial crisis in 1997, Korea has undertaken comprehensive structural reforms, including that in the corporate and financial sectors. To a large extent, the painful reforms were pushed forward based on the belief that these reforms were essential for regaining medium or long run growth momentum. However, it is not clear how these reforms are actually related to the post-crisis growth outcome of the Korean economy. What are the effects of such structural reforms on the medium or long run performance of the Korean economy after the crisis? This is surely an interesting and challenging question. However, one cannot expect to come up with a satisfactory answer to this question in a single study or two.

Instead, we narrow down on the scope of this paper and aim to evaluate how the post-crisis bankruptcy reform in Korea will affect the efficiency of resource reallocation, total factor productivity growth, and, eventually, post-crisis growth outcome of the Korean economy. For this purpose, we proceed in two steps. Firstly, we aim to provide stylized patterns of growth before and after the banking crises in a broad international perspective. In particular, we address the following two issues in this step. The first issue is whether there are any significant changes in growth associated with the banking crises. If the crises are not accompanied by the changes in medium or long term growth rates which go beyond the well-known short term economic contraction, then it might be pointless to discuss growth in relation to crises. Furthermore, in this case, it would be doubtful that post-crisis structural reforms play an important role in medium or long term growth performance of crisis-hit countries. The next issue is what role the total factor productivity growth (TFPG) plays in changes in growth, if any, over the banking crises. To address this issue, this paper accounts for the “changes in growth” before and after the banking crises. It is true that growth accounting by itself cannot pin down the exact policy measures which determine the post-crisis growth performance of crisis-hit countries. Nevertheless, growth accounting evidence could be useful in as much as it can narrow down the set of relevant policy measures. That is, the predominant role of macroeconomic policy, for example, is likely to be at odds with the finding that the changes in growth over the crises are mainly driven by TFPG since macroeconomic policies are not likely to explain medium or long term differences in TFPG.

The empirical evidence for this issue provides a framework for proceeding to the next step. In the second step, given the widely held perception that exit barriers for large firms deteriorated the efficiency of resource allocation before the crisis, we analyze whether the bankruptcy policy reform improved the efficiency of resource reallocation and, hence, the aggregate TFPG in the Korean economy after the crisis.

Although we have seen a boom of literature on the causes of the crisis and the patterns of short term recovery process since the Asian crisis, studies on medium or long term growth patterns over the crisis are relatively scarce. Park and Lee (2001) and Barro (2001) are notable exceptions. Park and Lee show that the reduction in medium or long run

growth rate is not associated with the currency crisis, relying on cross-country regressions. Barro reaches a similar conclusion for both currency and banking crises. If no significant changes in medium or long term growth are associated with the crisis in reality, as these studies suggest, then there might be no particular reason to study “post-crisis” growth as distinguished from the traditional subject of long term growth. These studies suggest that, even though the crises are typically accompanied by the short term contraction and recovery processes, it might be justified to ignore the possible interaction between crisis and growth in understanding medium or long term growth after the crisis.

In our view, however, these empirical results might only provide a partial picture of what’s really happening to the growth before and after the crisis. That is, if the growth process shows lack of persistence especially over the crisis, then even though there is no visible changes in the “average” growth rate of crisis-hit countries, it is still quite possible to observe varying fortunes of individual crisis-hit countries. In fact, there already exist studies which document that growth lacks persistency. Easterly, Kremer, Pritchett, and Summers (1993) show that decadal growth rate lacks persistence while factor input accumulation and individual country characteristics are highly persistent.¹ They argue that the widely held notion of persistent growth is a misperception created by a small group of East Asian countries which sustained high growth rates for several decades. Rodrik (1999) shows that a similar phenomenon is also found for the fifteen year growth rates before and after the first oil shock period.² Interestingly, while financial crises are quite likely to accompany medium- or long-term changes in economic performance, to the best of our knowledge, there are no previous studies examining the persistence of growth over the financial crisis in a broad international perspective. This study intends to fill this gap in the literature.

Recently, several researchers explicitly focused on financial crises as the event when trends in growth rate of the crisis-hit country might vary and explored its possible causes, although they used the case study approach. In the case of Japan, Hayashi and Prescott (2000) show that the 1990’s of the Japanese economy is the failure to improve productivity, not the failure to accumulate inputs. Based on this finding and other evidence, they further argue that the industrial policy of protecting failing or declining industries or firms by the Japanese government is the main culprit behind the “lost decade”. Meanwhile, in a comparative study of Chile and Mexico, Bergoeing, Kehoe, Kehoe, and Soto (2001) show that the decade-long divergent growth paths of the two countries since the financial crisis in the early 1980’s are predominantly driven by the differences in total factor productivity growth rates. They argue that policies that can potentially explain the differences in decade-long productivity improvement, such as the bankruptcy policy reform, are the candidates for explaining the different paths of the two countries. Noticeably, both studies interpret the importance of TFPG in post-crisis growth as one important piece of evidence suggesting that the key policies affecting post-crisis growth are ones which can result in large differences in TFPG performance over time, such as bankruptcy policy or resource reallocation policy.

Similar to these studies, this paper also considers the banking crisis as an event when changes in medium or long term growth might occur and examines the role of TFPG versus input accumulation in this process. Unlike these studies, however, this paper resorts to a broad cross-country experience to document the stylized patterns of growth over the

¹ Based on this finding and some additional analysis, they show that shocks, especially those to terms of trade, play an important part in explaining variations of growth rates.

² He argues further that latent social conflict determines the degree by which each country responds to the same shock.

banking crisis. We find that TFPG, rather than input accumulation, is the main driving force behind the changes in growth over the banking crisis.

Although this finding naturally leads us to examine the determinants of TFPG in thinking about the post-crisis growth performance of the Korean economy, we focus on bankruptcy policy among the potentially important determinants of TFPG in Korea as mentioned earlier. In fact, we believe that one can focus on the bankruptcy policy without losing too much understanding of the post-crisis growth in Korea for the following grounds. First, there are increasing pieces of evidence from firm or plant level studies that the resource reallocation process from exiting to entering producers explains a substantial portion of TFPG at the aggregate level. That is, most studies of this sort find that exiting producers exhibit persistently declining productivity while entering producers that survive market selection process show rapidly increasing productivity (Foster, Haltiwanger, and Krizan 1998, Hahn 2000, etc). These specific patterns of productivity dynamics suggests that policies that prevent the resources from being reallocated efficiently via entry and exit could be potentially very costly, and also that the cost will grow over time. Exit barriers, for example, will induce inefficient firms or industries to produce a growing share of output and lower the rate of aggregate productivity growth.

Second, as this paper will discuss later, the Korean corporate bankruptcy system prior to the crisis had a tendency to work as a *de facto* exit barrier. For example, before the bankruptcy policy reform in Korea, the producers with persistently declining productivity were much likely to be accepted into some rehabilitation procedures if they were regarded as having “high social value,” such as a large output or employment share in the economy. For these two reasons, bankruptcy policy reform and its consequences on the efficiency of resource reallocation might be a crucial element in understanding post-crisis growth in Korea.

Regarding the effect of the post-crisis bankruptcy policy reform on exit barriers, this paper shows the following points. After the post-crisis bankruptcy policy reform, the insolvent firms with persistent difficulties seem to be less likely to be accepted into the court-administered rehabilitation procedures. This finding is quite suggestive of the fact that the post-crisis bankruptcy policy reform contributed to enhancing the efficiency in resource reallocation process by helping to lessen the exit barriers in the Korean economy.

The broad outline of this paper is as follows. In section 2, we document stylized patterns of growth in crisis-hit countries before and after the crisis, relying on broad international experiences of the banking crisis. Specifically, we ask whether there are any significant changes in growth associated with the crisis and, if so, whether the changes in growth are mostly driven by the changes in total factor productivity or factor inputs. We expect to find a significant role of TFPG if structural reforms or bankruptcy policy reform in particular are important in post-crisis growth, as the effects of those reforms will show up as efficiency improvement. In section 3, we examine the effects of the post-crisis bankruptcy policy reform in Korea on the resource reallocation process, using firm-level data. For this purpose, we discuss the key elements of the post-crisis bankruptcy reform and then proceed to analyze the TFP performance of distressed firms entering court-administered rehabilitation procedures before and after the bankruptcy policy reform. In section 4, we summarize and conclude this paper.

CHAPTER 2

The Role of TFPG in Post-Crisis Growth Performance

2-1 Basic Facts

In this section we examine the stylized patterns of growth before and after the banking crisis in a broad cross-country perspective. We think that broad cross-country evidence could serve as a framework to understanding the post-crisis growth in Korea. Specifically, we first examine whether significant changes in medium or long term growth are associated with the banking crisis.

In order to examine the patterns of growth over the banking crisis, banking crisis dates have to be identified. In this paper, data on banking crisis episodes are taken from Caprio and Klingebiel (1999). They present information on 114 episodes of systemic banking crisis in 93 countries and on 51 episodes of borderline and non-systemic banking crisis in 46 countries since the late 1970s. We use information only on the systemic banking crisis. The number of episodes in this paper is 62 in 48 countries since we kept only those countries for which we could obtain growth accounting results that will be presented later.³ The list of banking crisis episodes included in the sample is in <Table 1>.

<Figure 1> shows the movements of the average per worker GDP growth rates in the sample during the fifteen years before and after the crisis year, expressed as the difference from the tranquil period average. Here, the tranquil period is the period when banking crisis did not occur within a window of plus/minus two years. Overall, the figure suggests that, *on average*, significant change in medium run per worker GDP growth rate is not associated with the banking crisis, although short run output loss is clearly present. During most of the period before the crisis year, the average per worker GDP growth rate fluctuates around the level slightly below the tranquil period average without showing any clear pattern. The growth rate declines slightly shortly before the beginning of the crisis and collapses with the onset of the crisis. The growth rate recovers to the pre-crisis level in about three years and stays there thereafter. Thus, at least in terms of *average* growth rate, there is no indication that the drop in output growth rate extends over three years, which seems broadly consistent with the regression-based empirical results obtained previously (Park and Lee 2001, Barro 2001).

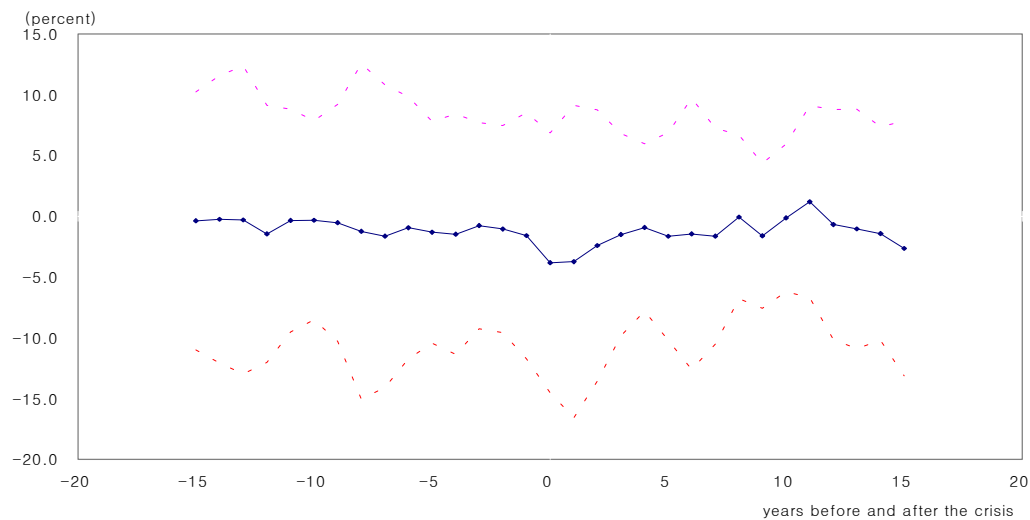
Based on the above observation, however, one cannot exclude the possibility that individual countries experience significant changes in output growth rates after the crisis. That is, the finding that average per worker GDP growth rate changes little over the crisis might mask divergent experiences of individual countries. To examine whether growth is persistent over the crisis, <Figure 2> compares the average per worker GDP growth rates over the two fifteen year periods before and after the crisis episodes. Here, it is evident that growth rates vary considerably over the two periods. That is, pre-crisis growth rate is only a poor predictor of post-crisis growth rates.

³ Banking crisis episode on Uganda was also excluded from the sample due to data reliability.

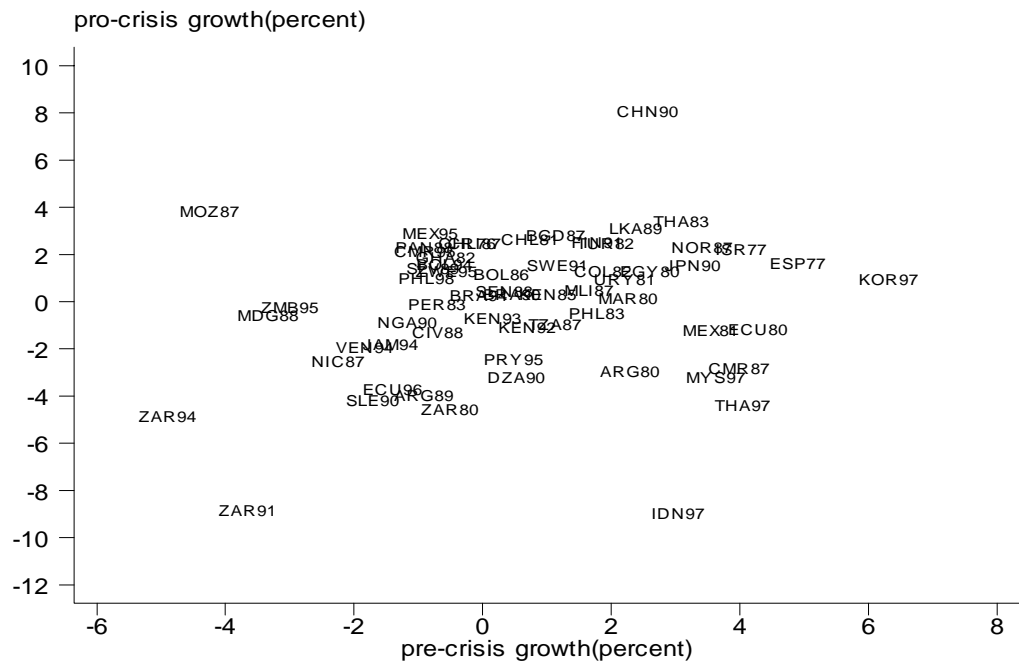
<Table 1> List of Banking Crisis Episodes

Region	Country	Banking* Crisis Year	Region	Country	Banking* Crisis Year
East Asia	China	1990	Middle East	Algeria	1990
	Indonesia	1997		Egypt	1980
	Korea	1997		Israel	1977
	Malaysia	1997		Morocco	1980
	Philippines	1983	South Asia	Bangladesh	1987
		1998		Sri Lanka	1989
	Thailand	1983	Sub-Sahara	Ivory Coast	1988
		1997		Cameroon	1987
Latin America	Argentina	1980			1995
		1989		Ghana	1982
		1995		Kenya	1985
	Bolivia	1986			1992
		1994			1993
	Brazil	1990		Madagascar	1988
		1994		Mali	1987
	Chile	1976		Mozambique	1987
		1981		Nigeria	1990
	Colombia	1982		Senegal	1988
	Costa Rica	1987		Sierra Leone	1990
	Ecuador	1980		Tanzania	1987
		1996		Zaire	1980
	Jamaica	1994			1991
	Mexico	1981			1994
		1995		Zambia	1995
	Nicaragua	1987		Zimbabwe	1995
	Panama	1988	Industry	Spain	1977
	Peru	1983		Finland	1991
	Paraguay	1995		Japan	1990
	El Salvador	1989		Norway	1987
	Uruguay	1981		Sweden	1991
	Venezuela	1994		Turkey	1982

<Figure 1> Average Per Worker GDP Growth Rate over the Banking Crises

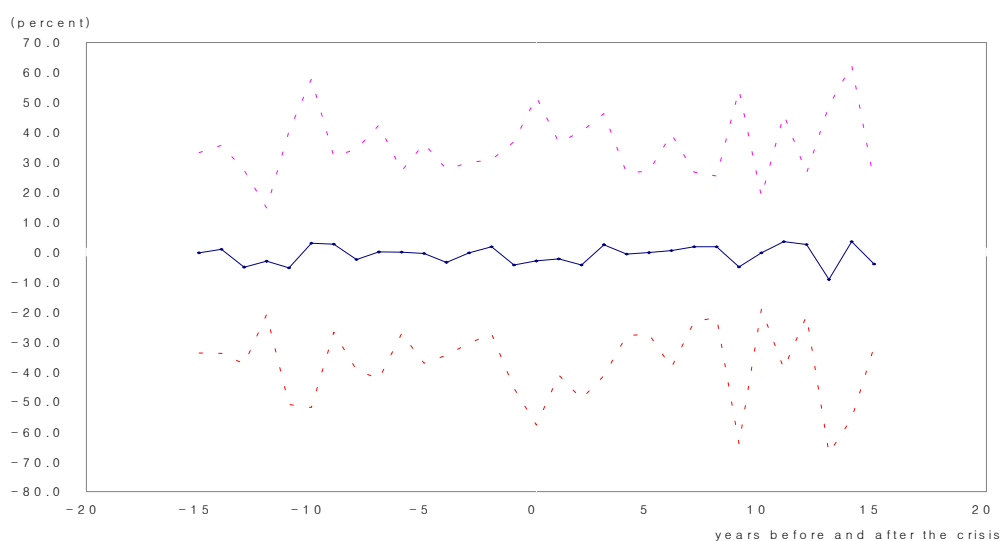


<Figure 2> Per Worker GDP Growth Before and After the Banking Crises



Now, what happens to the investment rate over the crisis over the medium run? Figure 3 shows movements of the sample average investment over GDP ratio over the banking crises, again expressed as the difference from the tranquil period average. Similar to the case of average GDP growth rate, as shown in Figure 1, the post-crisis investment doesn't seem to be permanently depressed, either. The investment ratio drops somewhat below the tranquil period average one year before the crisis, and stays low until the second year after the crisis. From the third year after the crisis, the investment ratio recovers to the tranquil period average and maintains that level thereafter.

<Figure 3> Average Investment Ratio over the Banking Crises



However, if we examine the changes in investment ratios of individual countries, the pattern is quite different from that observed for the GDP growth rate. Figure 4 shows the scatter plot of average investment rates in the two 15 year period around the banking crisis. It is clear from the figure that, in contrast with GDP growth rate, post-crisis investment ratio is strongly correlated with pre-crisis investment ratio. That is, countries with high investment ratio are likely to remain as high-investment countries after short-term adjustment is completed. In sum, investment rate is more persistent than per worker GDP growth rates over the periods before and after the banking crises. This finding suggests that whatever it is that drives the divergent growth outcome of crisis-hit countries, it is not likely to be dominated by the variations in investment.

One might ask whether the low persistence in growth rate is driven by the inclusion of episodes for which sufficiently long time series are not available after the crisis. This possibility arises for the following reason. In those episodes for which only a short time has elapsed, average post-crisis growth rate will tend to be lower than pre-crisis growth rate since several years of economic contraction is typically associated with the banking crisis.⁴ In this situation, if we include those episodes in the sample when the growth rate is persistent in reality, it will bias the result in favor of finding low persistence in growth. To check this possibility, <Table 2> shows simple and rank correlations of per worker GDP

⁴ This will be particularly true if the level of the post-crisis GDP does not revert to the path predicted by the pre-crisis growth, as suggested by Figure 1.

growth rate and investment ratio in sub-samples obtained by excluding recent banking crisis episodes. To begin with, the first row of <Table 2> confirms low persistence in growth rate and high persistence in investment ratio as we discussed above; the simple correlation of investment ratios between the two periods is 0.66 which is much larger than the growth correlation of 0.19, in all sample. The second row shows correlations when the twelve episodes are excluded from the sample for which less than five years of data are available after the crisis. Even though the correlations of growth rate become somewhat stronger, it still holds that GDP growth rate is much less persistent than the investment ratio. If we exclude episodes for which less than ten years of data are available after the crisis, the simple correlation of growth rate becomes almost zero while the correlation of investment ratio is still high at 0.47. The remaining rows of <Table 2> shows the correlations for sub-samples of countries—developing countries, and non-East Asian developing countries. Again, correlations of growth rate are found to be much weaker than correlations of investment ratio.

<Table 2> Correlations of Growth and Investment Before and After Banking Crises

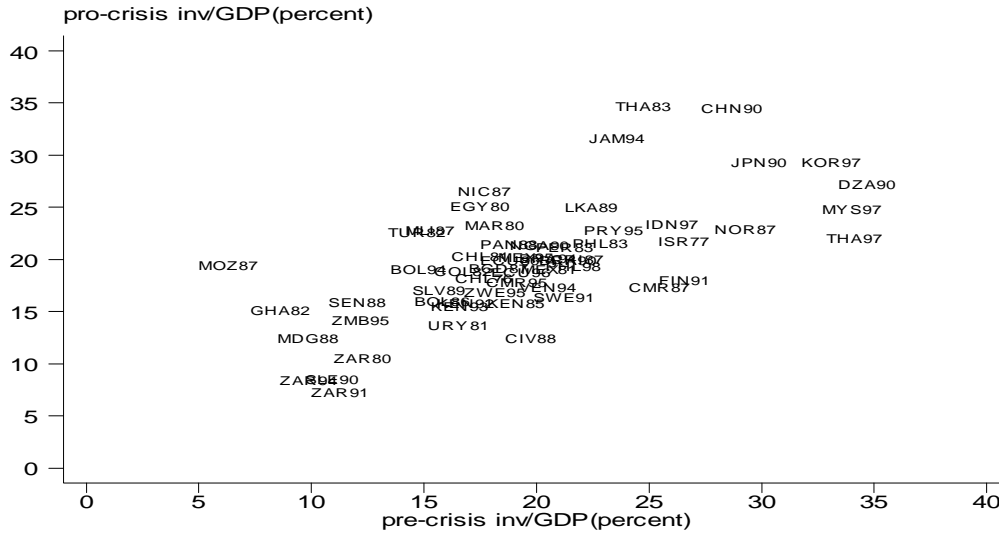
		Per worker GDP growth rate		Investment ratio	
		Simple	Rank	simple	Rank
All sample	62	0.188	0.177	0.661	0.652
Excluding episodes with Crisis year \geq 1995	50	0.396	0.346	0.648	0.611
Excluding episodes with Crisis year \geq 1990	34	0.042	0.065	0.467	0.423
Developing countries	56	0.132	0.113	0.677	0.694
Non-East Asian Developing Countries	48	0.252	0.207	0.630	0.603

Low persistence of growth rate and high persistence of investment ratio have been previously reported in other studies. Easterly, Kremer, Pritchett, and Summers (1993) focus on decadal growth rate and investment and show that growth lacks persistence while investment is persistent. Based on this observation, they argue that the widespread perception of persistent growth rate differences is strongly affected by the small sample of East Asian countries which sustained high growth rate for a long period.⁵ Rodrik (1999) makes a similar observation by focusing on the variations in growth rate around the first oil shock period.⁶ The findings of this study are broadly in line with these studies. However, the new finding from this study is that low persistence of growth together with high persistence in investment is also found at around the time of the banking crisis. That is, there seems to be an ample possibility that high-growth countries become low-growth countries, and vice versa, without significant changes in investment ratio, as those countries go through banking crises.

⁵ They show that shocks, especially those to terms of trade, play a large role in explaining cross-country variations in growth.

⁶ Motivated by the observation that external shocks often cripple economic performance to an extent that is vastly disproportionate to the direct economic consequences of these shocks, Rodrik (1999) argues that domestic social conflicts are key elements in understanding growth collapses in many countries since the mid-1970s.

<Figure 4> Investment Ratio Before and After the Banking Crises



2-2 “Changes in Growth” Accounting: TFPG vs Input Accumulation

Now, utilizing growth accounting methodology as employed in Klenow and Rodriguez-Clare (1997) and Hayashi and Prescott (2002), we examine the respective role of TFPG and input accumulation in explaining the changes in per worker GDP growth rate over the banking crisis. Specifically, the production function is assumed to be the Cobb-Douglas form as follows.

$$Y_t = A_t K_t^\theta L_t^{1-\theta},$$

where Y_t is output, K_t is capital stock, L_t is economically active population as a measure of labor input, A_t is total factor productivity, and θ is capital share parameter. If we let N_t denote the number of workers measured as the number of working-age population, then per worker output y_t can be rearranged as follows.

$$y_t = A_t^{\frac{1}{1-\theta}} x_t^{\frac{\theta}{1-\theta}} p_t,$$

where x_t and p_t are capital-output ratio and participation rate, respectively. Then the growth rate of per worker output from t to $t+s$ can be expressed as:

$$\begin{aligned} [\log y_{t+s} - \log y_t] / s &= \frac{1}{1-\theta} [\log A_{t+s} - \log A_t] / s \\ &+ \frac{\theta}{1-\theta} [\log x_{t+s} - \log x_t] / s + [\log p_{t+s} - \log p_t] / s \end{aligned}$$

Suppressing time subscript, this equation can be more succinctly expressed as:

$$g_y = \frac{1}{1-\theta} g_A + \frac{\theta}{1-\theta} g_x + g_p = \frac{1}{1-\theta} g_A + g_Z$$

So, the per worker output growth g_y can be decomposed into the contribution from TFP changes $1/(1-\theta) \cdot g_A$ and the contribution from factor inputs g_Z . The contribution from factor inputs can be further broken down into the contribution from changes in the capital-output ratio $\theta/(1-\theta) \cdot g_x$ and the contribution from changes in participation rate g_p . As Klenow and Rodriguez-Clare (1997) point out, this methodology differs from conventional growth accounting methodology in that changes in capital stock induced by changes in TFP are attributed to the contribution from TFP changes. On a balanced growth path, where output and capital per worker grow at the same rate and capital-output ratio and participation rate are constant, the growth accounting methodology employed here will attribute all of the per worker output growth to TFP growth.

In order to see whether the change in per worker GDP growth rate over the banking crisis is driven by TFPG or factor inputs, we perform “change in growth” accounting as follows.

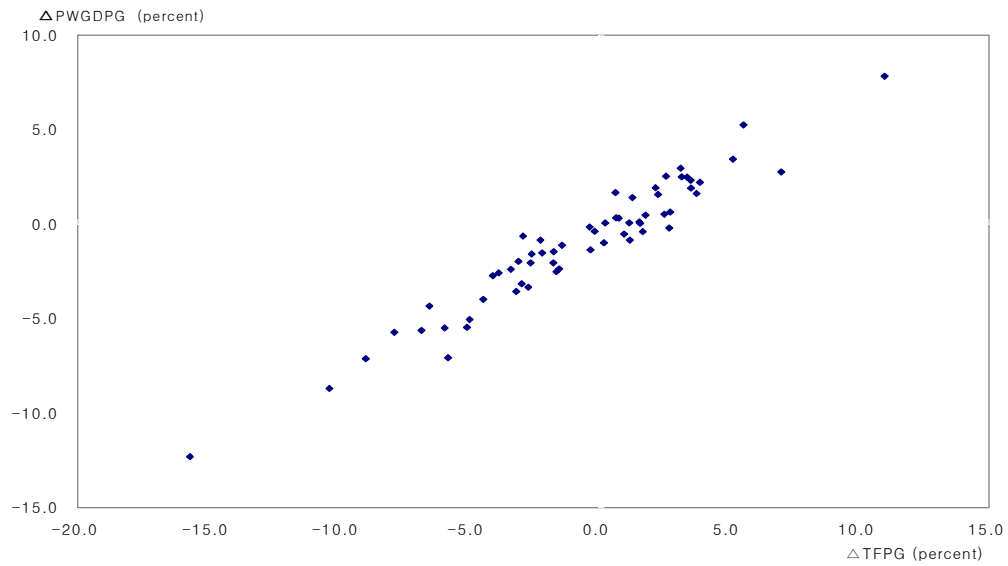
$$\Delta g_y = \frac{1}{1-\theta} \Delta g_A + \frac{\theta}{1-\theta} \Delta g_x + \Delta g_p = \frac{1}{1-\theta} \Delta g_A + \Delta g_Z \quad (1)$$

Figure 5 shows scatter plots of changes in fifteen year average per worker GDP growth rates before and after the crisis against changes in contribution from TFPG and changes in contribution from factor inputs. The figure clearly shows that the change in growth performance before and after the banking crisis is strongly correlated with changes in TFPG. By contrast, the change in factor input contribution is not positively correlated with the change in growth—the correlation between those two variables is weakly negative.⁷ Here, the negative correlation between the change in growth and the change in factor input contribution is driven by the negative correlation between the change in growth Δg_y and the change in the behavior of capital-output ratio Δg_x <Figure 6>. The correlation between the change in growth and the change in the movement of participation ratio, Δg_p , is essentially zero. Thus, on an accounting basis, it is the changes in TFPG, not the changes in the pace of input accumulation, that drives the changes in per worker GDP growth rates before and after the crisis.

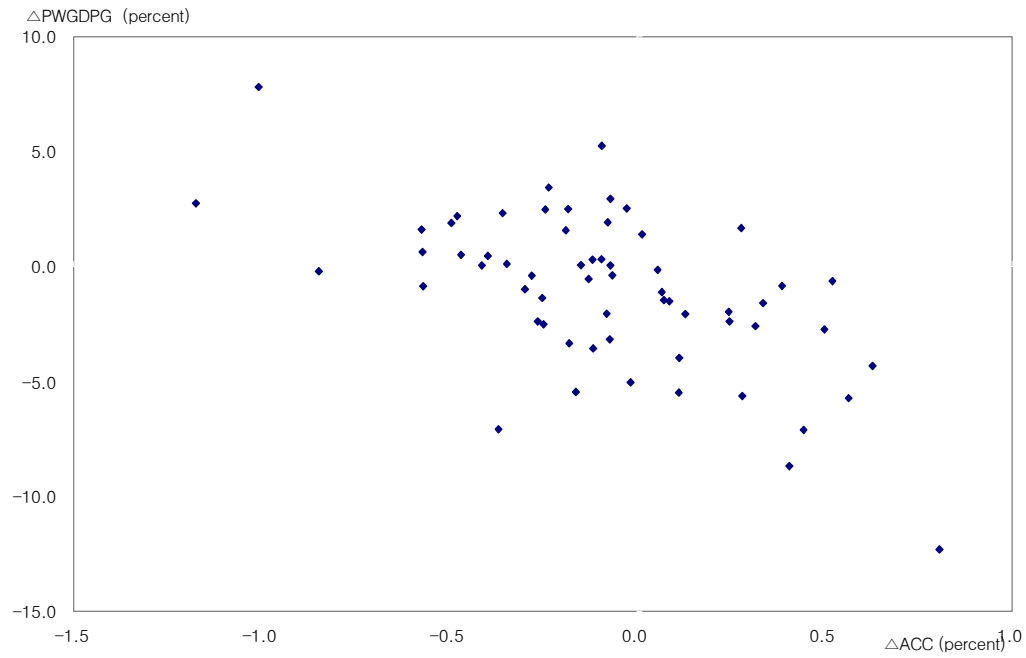
It is worth emphasizing here that negative correlation between the change in growth and the change in the movement of capital-output ratio is quite consistent with the standard neoclassical growth model where trend or long-run growth is “induced” by the exogenous TFP changes. In the standard growth model, the capital-output ratio rises as output growth falls because the capital-output ratio associated with a lower TFP growth is higher. In the steady state with a lower TFP growth, higher capital-output ratio is expected for the following reason. In the new steady state with lower TFP growth, the consumption growth rate is lower, which implies that the rate of return from capital is lower. Under diminishing returns to capital, the capital-output ratio must therefore be higher. Hayashi and Prescott (2002) shows that lower TFP growth, decrease in return on capital, and increase in capital-output ratio are actually what happened to the Japanese economy during the 1990s.

⁷ It is not warranted to infer from figure 5 and 6 that higher post-crisis per worker GDP growth experience is associated with slower pace of per worker capital accumulation after the crisis. As will be discussed below, the change in per worker GDP growth and the change in per worker capital accumulation are positively correlated.

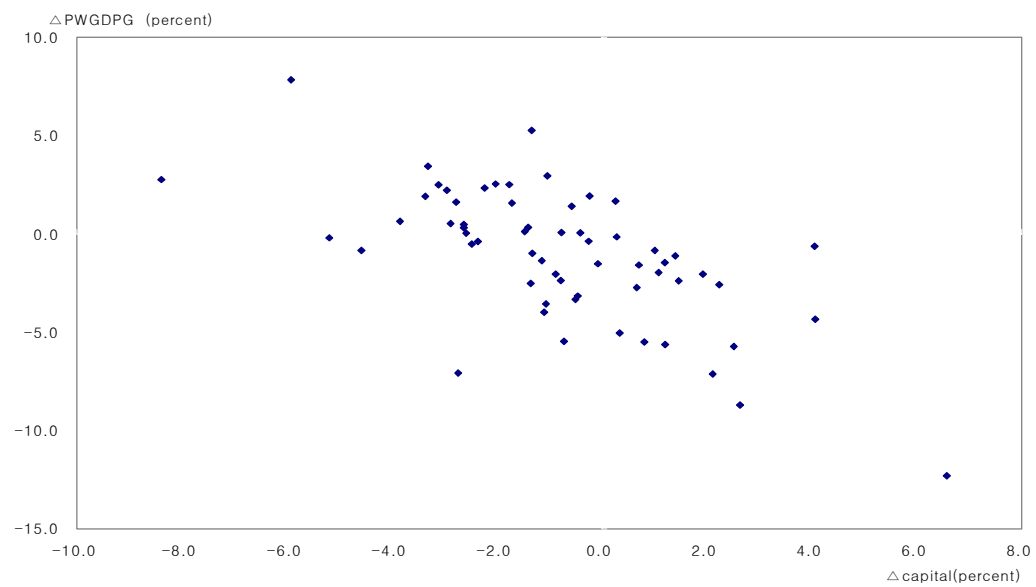
<Figure 5-1> Changes in Growth and Changes in TFPG



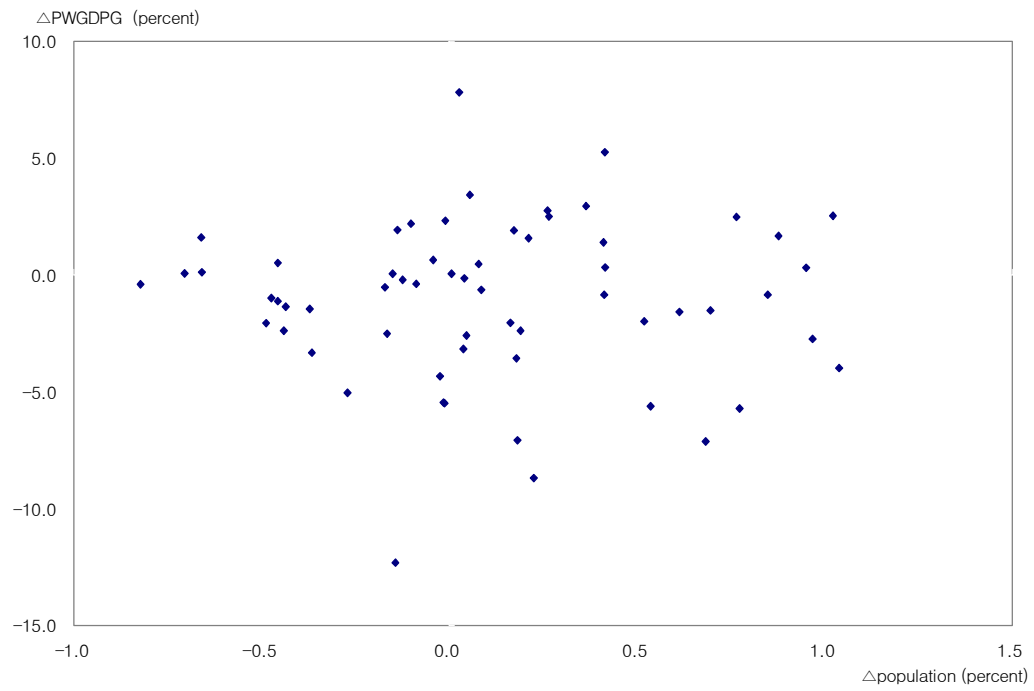
<Figure 5-2> Changes in Growth and Changes in Factor Input Growth



<Figure 6-1> Changes in Growth and Changes in the Pace of Capital Deepening



<Figure 6-2> Changes in Growth and Changes in Output Contribution From Labor Participation Ratio



Thus, the growth accounting evidence presented in figure 5 and 6 is consistent with the prediction of the standard growth model where growth is ultimately driven by the pace of TFPG. In this sense, the evidence seems consistent with the hypothesis that the changes in TFPG “drive” the changes in per worker GDP growth over the banking crisis not only in the accounting sense, but also in the causal sense.

2-3 Conventional Growth Accounting

We also performed conventional growth accounting exercise to see the role of TFPG in the changes in growth over the banking crises. We do this as a robustness check. That is, the previous growth accounting methodology might erroneously downplay the role of changes in capital accumulation, by attributing the changes in capital stock consistent with steady state growth to contribution from TFPG.

As noted earlier it should be born in mind that the conventional growth accounting differs from the one employed earlier in that it does not attribute the changes in per worker capital stock induced by changes in TFP to the contribution from TFP. To carry out conventional growth accounting, per worker output y_t can be expressed as:

$$y_t = A_t k_t^\theta p_t^{1-\theta},$$

Here, k_t is per worker capital stock. Using this expression and following the similar procedure as above, we can decompose the change in per worker GDP growth over the banking crisis into the contributions from the change in TFPG, the change in per worker capital stock growth rate, and the change in the behavior of participation rate. Again, the latter two components can be regarded as the contribution from factor inputs. That is:

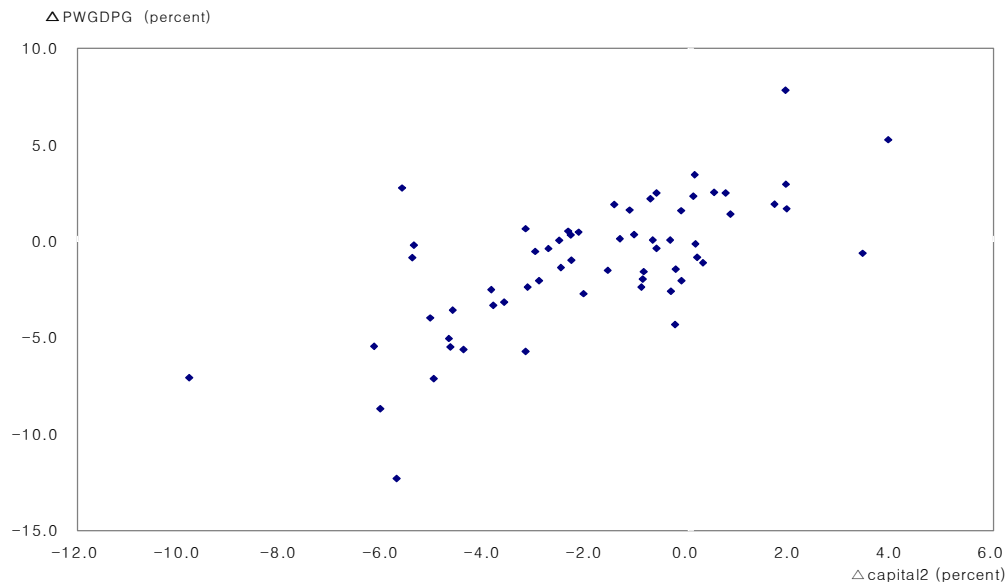
$$\Delta g_y = \Delta g_A + \theta \Delta g_k + (1 - \theta) \Delta g_p = \Delta g_A + \Delta g_Z \quad (2)$$

Even when we use conventional growth accounting methodology, the change in growth before and after the crisis is still more strongly correlated with the change in TFPG than with the change in the pace of input accumulation. This can be seen from <Figure 7>, which shows the change in per worker GDP growth over the crisis against the change in TFPG and the change in the contribution from factor inputs, respectively. This point can also be confirmed by calculating correlation coefficients among four variables; the change in per worker GDP growth Δg_y and its three components in conventional growth accounting. <Table 3> shows that the correlation between Δg_y and Δg_A is very strong at 0.97, which is much larger than the correlation between Δg_y and Δg_k , which is also strong at 0.69.

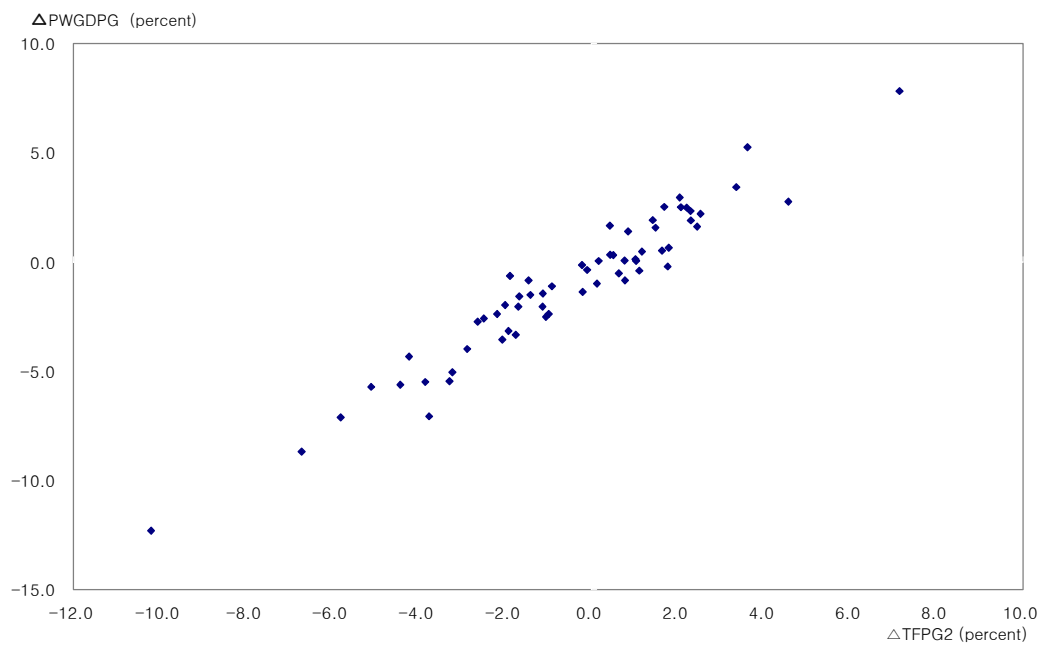
<Table 3> Correlations among Components of Changes in Growth Accounting

	Δg_y	Δg_k	Δg_A	Δg_p
Δg_y	1.000	0.690	0.966	-0.007
Δg_k	0.690	1.000	0.495	0.048
Δg_A	0.966	0.495	1.000	-0.127
Δg_p	-0.007	0.048	-0.127	1.000

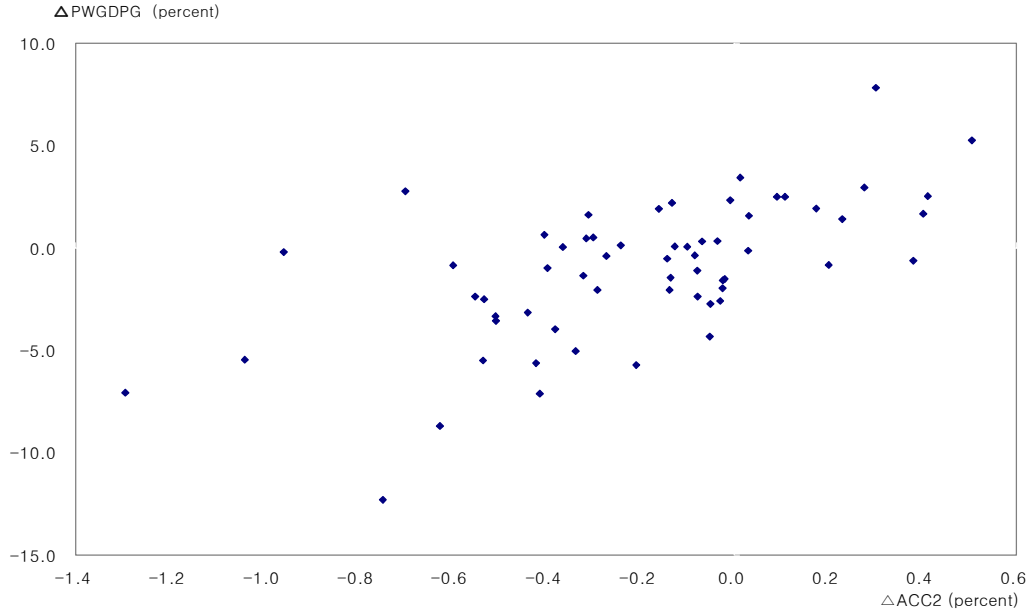
<Figure 7> Changes in Growth and Changes in Capital Stock Growth



<Figure 8-1> Changes in Growth and Changes in TFPG: Conventional Growth Accounting Methodology



<Figure 8-2> Changes in Growth and Changes in Factor Input Growth: Conventional Growth Accounting Methodology



Thus, if we view the changes in capital stock as independent from the changes in total factor productivity, the role of TFPG in changes in growth over the banking crises becomes somewhat weaker. Nevertheless, it still holds that the variation in TFPG, rather than the variations in input accumulation, is the dominant factor behind the diverse growth outcome after the banking crises.

2-4 Variance Decomposition of the Changes in Growth

One can make a quantitative assessment of the respective roles of TFPG and input accumulation in the changes in per worker GDP growth around the banking crises by decomposing the variance of the changes in growth. Starting from the conventional growth accounting formula as in equation (2) and evenly distributing the covariance term between Δg_y and Δg_y , we can decompose the variance of Δg_y as follows:

$$\text{var}(\Delta g_y) = \text{cov}(\Delta g_A, \Delta g_y) + \text{cov}(\Delta g_{Z'}, \Delta g_y).$$

By dividing both sides of the above equation by $\text{var}(\Delta g_y)$, we obtain:

$$1 = \frac{\text{cov}(\Delta g_A, \Delta g_y)}{\text{var}(\Delta g_y)} + \frac{\text{cov}(\Delta g_{Z'}, \Delta g_y)}{\text{var}(\Delta g_y)}.$$

The above equation says that the coefficients from regressing Δg_A and $\Delta g_{Z'}$ on Δg_y sum up to unity. Thus, as Klenow and Rogriguez-Clare (1997) point out, this decomposition shows how much higher Δg_A and $\Delta g_{Z'}$ are, respectively, given that a country's Δg_y is one percentage point higher relative to the sample mean. Similar procedure can be applied to

the growth accounting formula in equation (1).

As shown in <Table 4>, the variance of the changes in per worker GDP growth over the banking crises is more than explained away by the changes in TFPG when growth accounting involves capital output ratio. This result could be expected from Figure 5 which shows the positive relationship between changes in growth and changes in TFPG together with the negative relationship between changes in growth and changes in input accumulation. Also, this conclusion is robust to the time period after the banking crisis in forming changes in variables.

When we use conventional growth accounting methodology where the variations in capital stock is given a bigger role, there is a modest role of changes in input accumulation in explaining changes in growth. However, we still observe a predominant role of changes in TFPG; more than 80 percent of the variance of Δg_y is attributable to the changes in TFPG.

<Table 4> Variance Decomposition of Changes in Per Worker GDP Growth Before and After the Banking Crises

Growth Accounting Method	Time Period After the Crisis	Δ Input Accumulation	Δ TFPG	total
Hayashi and Prescott (2002), etc.	T+1 – t+5	-0.300	1.300	1.000
	t+1 - t+10	-0.262	1.262	1.000
	t+1 - t+15	-0.256	1.256	1.000
Conventional	t+1 - t+5	0.155	0.845	1.000
	t+1 - t+10	0.180	0.820	1.000
	t+1 - t+15	0.184	0.816	1.000

CHAPTER 3

Bankruptcy Policy and Allocation Efficiency Before and After the Korean Crisis

So far, we examined growth experiences in crisis-hit countries in a broad international perspective and found out that TFPG rather than input accumulation plays a dominant role in post-crisis growth. In this section, we focus on bankruptcy policy among the potentially important determinants of TFPG in Korea as already noted in the introduction. We attempt to examine empirically the effects of the post-crisis bankruptcy policy reform on the efficiency in resource allocation.

After the economic crisis, the government made reform efforts to remove exit barriers along two separate lines: one is the court-administered bankruptcy procedure, and the other, the pre-bankruptcy informal arrangements for corporate restructuring. As <Table 5> shows, the workout procedure played an important role in dealing with the largest ailing firms.

<Table 5> Insolvent Firms' Procedure by the Chaebol Category

(unit: trillion won, %)

	1997			1998				1999			
	No Proce- dure	Com- position	Corpor- ate Reorg	No Proce- dure	Com- position	Corpor- ate Reorg	Work- out	No Proce- dure	Com- position	Corpor- ate Reorg	Work- out
1-30 Largest Chaebols	0.35 (3.38)	0.61 (5.80)	9.48 (90.82)	0.09983 (1.73)	0 (0.00)	0 (0.00)	5.669 (98.27)	0 (0.00)	0 (0.00)	0 (0.00)	3.455 (100)
31-60 Largest Chaebols	0 (0.00)	0 (0.00)	0.19 (100)	0 (0.00)	0 (0.00)	0 (0.00)	5.713 (100)	0 (0.00)	0 (0.00)	0 (0.00)	0.5862 (100)
61-300 Largest Chaebols	3.18 (13.51)	7.69 (32.66)	12.67 (53.84)	0.7850 (3.54)	1.560 (7.03)	6.795 (30.62)	13.05 (58.81)	0 (0.00)	1.081 (6.73)	0.2857 (1.78)	14.71 (91.50)
Small Chaebols and Independent Firms	3.95 (29.16)	1.32 (9.73)	8.27 (61.11)	2.090 (24.44)	1.638 (19.16)	1.469 (17.18)	3.354 (39.22)	0.4627 (1.69)	0.9036 (3.29)	0.4040 (1.47)	25.68 (93.55)

Notes: 1) The frequencies are weighted by the asset size.

2) Author's calculation for all the firms in the NICE data.

3) Numbers in parentheses denote the percentage.

Source: Lim, Youngjae (2002)

Having admitted this, in this paper we focus on the policy reform in the court-administered bankruptcy system. Except for the small-sized firms with simple capital structure, the court-administered bankruptcy procedures would be usually the last stages for ailing firms to resort to if the interested parties could not agree on the pre-bankruptcy informal arrangements for corporate restructuring.⁸ For the pre-bankruptcy informal arrangements, one of the most effective disciplines should come from the discipline in the court-administered bankruptcy procedures. In this sense, the court-administered bankruptcy system plays a crucial role in the whole bankruptcy system. In out-of-court administered settlements, the interested parties' incentives would be directly affected by the structure of court-administered bankruptcy settlements.

3-1. Court-Administered Bankruptcy System Before and After the Crisis⁹

Before the economic crisis of 1997, most ailing firms did not use the bankruptcy procedures overseen by the courts. The debt of bankrupt firms was usually collected on an individual basis under the Civil Procedure Act. Most assets of the bankrupt firms were already subject to mortgage or to security, and little was left for unsecured creditors. Additional procedures for the collection of debt were not needed.

Although most bankrupt firms were effectively liquidated on a non-judicial basis, some bankrupt firms were periodically bailed out by the government through various "rationalization" measures; for example, such measures were undertaken in the mid-1980s. These measures also undercut the use of formal bankruptcy procedures.

One technical hurdle to the use of judicial bankruptcy procedures was the Act on Special Measures for Unpaid Loans of Financial Institutions. The Act gave the Korea Asset Management Corporation (KAMCO) the authority to hold auctions of the assets of bankrupt firms before court procedures began. It stopped the Corporate Reorganization Act from operating in practice since the auction of assets by KAMCO effectively preempted the corporate reorganization process. In 1990, the Constitutional Court declared this provision unconstitutional, paving the way for the wider use of judicial bankruptcy procedures.

By enacting the Rule on Corporate Reorganization Procedure in 1992, the Supreme Court began to move in the direction of improving judicial bankruptcy procedures. Among other things, the new rule established the conditions for the initiation of corporate reorganization proceedings. These included high social value, financial distress and possibility of rehabilitation; interestingly, economic efficiency was not a requirement for corporate reorganization.

Several episodes of abuse of the corporate reorganization procedure by the controlling shareholders of the ailing firms led the Supreme Court to amend the 1992 Rule in 1996. In particular, the Court argued that the shares of controlling shareholders responsible for a firm's failure should be wiped out. This revision produced an unanticipated outcome: the owners of ailing firms looked for other possibilities that would allow them to maintain their control. They found such an alternative in the composition procedure. The composition procedure was originally designed for small and medium-sized firms with simple capital structures, but there was no explicit limit on firm size until the law was revised in 1998. Composition required advance agreement with creditors before the court officially

⁸ Within the court-administered bankruptcy procedures, the liquidation procedure would be the last resort.

⁹ This section draws much from Lim, Youngjae(2002).

considered an application. A court-provided stay under the composition procedure applied only to unsecured creditors; secured loans could be collected. But what made the composition procedure popular was the fact that existing management maintained control.

<Table 6> and <Figure 9> show the resulting flight to the composition procedure. Filings for composition exploded from nine cases in 1996, to 322 cases in 1997, and to 728 cases in 1998. In the first three quarters of 1997, before the onset of the crisis, many large firms facing bankruptcy sought to file for the composition procedure. Among these firms, the case of Kia Motors deserves special mention since it played an important role in the unfolding of the crisis in mid-1997. The debtor and the creditors initially wanted to apply for different procedures: Kia initially filed for composition, but shortly thereafter creditors chose to file for corporate reorganization. When both procedures are filed in this way, the filing for corporate reorganization overrides the one for composition. In the end, the court accepted Kia Motors into corporate reorganization, but the uncertainty and delay in dealing with ailing firms such as Kia clearly added to the uncertainty in the economy before the crisis broke out.

The economic crisis of 1997 put the existing corporate bankruptcy system, both judicial and non-judicial, under great strain. The number and scale of bankruptcies soared. <Table 7> shows that the filings for judicial bankruptcy procedures rose dramatically in 1997. This internal pressure on the system was a driving force for the changes in laws and procedures that followed in 1998 and 1999, although the IMF and the IBRD also demanded an improvement in the corporate bankruptcy system as a condition for the bailout package.

The revision of 1998 represented the most substantial change in the system since the enactment of the corporate bankruptcy laws in 1962. But pressed for time in the wake of the crisis, the government did not succeed in initiating a fully comprehensive revision, which accounts for the second round of reform in 1999.

<Table 6> Ailing Firms' Bankruptcy Filings before and after the Crisis

(unit: number of cases, %)

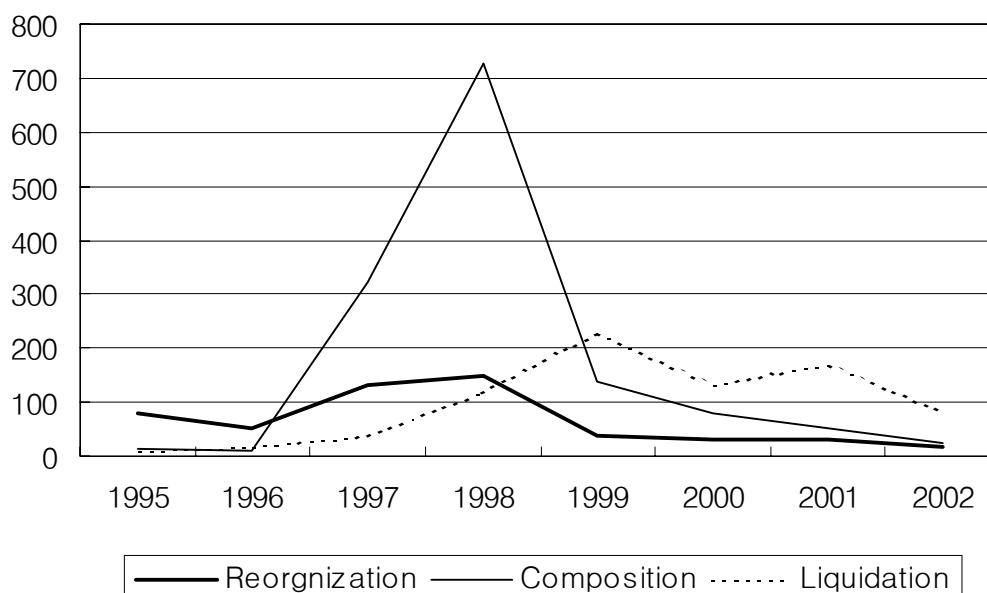
Year Bankruptcy Procedure	1995	1996	1997	1998	1999	2000	2001	2002 ¹⁾
Reorganization	79 (76.0)	52 (65.8)	132 (26.8)	148 (12.1)	37 (5.4)	32 (7.3)	31 (4.1)	19 (15.3)
Composition	13 (12.5)	9 (11.4)	322 (65.5)	728 (59.4)	140 (20.6)	78 (17.8)	51 (6.8)	23 (18.6)
Liquidation	12 (11.5)	18 (22.8)	38 (7.7)	117 (9.5)	230 (33.8)	132 (30.1)	170 (22.5)	82 (66.1)
Total	104 (100.0)	79 (100.0)	492 (100.0)	993 (100.0)	407 (100.0)	242 (100.0)	252 (100.0)	124 (100.0)

Note: 1) from January to October.

2) Numbers in parentheses denote the percentage.

Source: Supreme Court of Korea

<Figure 9> Ailing Firms' Bankruptcy Filings



Through these two revisions, the role of the courts in the corporate bankruptcy process increased significantly; if it were not for the workout procedure introduced as an “out-of-court” settlement process in 1998, the role of the courts would have been even larger. In this process, the relative weight of court settlement and out-of-court settlement and the optimal size of firms participating in court settlement, remain among the most important issues for future reform. This is especially the case given that the delayed process of financial sector restructuring is likely to put the out-of-court procedure under the influence of the government, the controlling shareholder of several major banks.

To improve the court settlement process, the 1998 revision introduced new provisions into the bankruptcy laws while maintaining the existing framework. Most importantly, the new law introduced an economic efficiency criterion to qualify for judicial bankruptcy procedures instead of one based on high social value and prospects for rehabilitation. A comparison of the value of a distressed firm as a going-concern with its liquidation value is now required for the initiation of all judicial bankruptcy proceedings.

To prevent the abuse of the composition procedure, some critical changes were also made to the Composition Act. Large firms with complicated capital structures were not allowed to enter composition. <Table 6> shows the impact of this change: the number of composition filings decreased sharply from 728 in 1998 to 140 in 1999.

Despite these changes, the 1998 revision left room for further reform. To some extent, in fact, the 1999 revision filled the gap between initial reform proposals and what was finally passed in the 1998 revision. In the 1999 revision process there was initial debate on the inclusion of an automatic stay in the new law. Under an automatic stay, the debtors' assets are automatically protected on filing from the creditors' rush to secure their claims. The pros and cons of the automatic stay were both strong. The final compromise sped up the initiation of the proceedings to within one month of the filing.

Automatic stay can contribute to the rehabilitation of ailing firms after bankruptcy. On the other hand, the debtor might use the court to avoid a formal default and thereby evade

criminal punishment under the Illegal Check Control Act. According to the Illegal Check Control Act, the managers or owners of ailing firms who issued bad checks are criminally liable. This was developed to overcome the informational asymmetry between the debtor and the creditors. Dealing with highly unreliable accounting information, creditors would be much less willing to lend money to debtors without such recourse. The debtors are in effect forced to make a credible commitment to repayment by risking incarceration in case of default.

The new revision also facilitated an efficient (mandatory) transition between corporate reorganization and liquidation. After the initiation decision, the court must compare the going-concern value of the firm with its liquidation value. If the liquidation value turns out to be larger than the going-concern value, the court *must* declare the liquidation of the firm. Donga Construction was the first large firm to go down this path; the company was liquidated in early 2001. At the time when the liquidation decision was made, the asset size of Donga Construction was estimated to amount to about 5 trillion won. In fact, this was shattering the 'too big to fail' (or, 'too big to liquidate') belief held by the public. After the case of Donga Construction, several cases of the mandatory liquidation followed for large firms.

However, the cases of mandatory liquidation produced an unintended outcome. Now ailing firms do not want to use the judicial bankruptcy procedures since they fear the possibility of forced liquidation. In <Table 6>, the number of bankruptcy filings decreases sharply in 2001-2 because of the mandatory liquidation. Resolving this problem remains as one of the major future tasks in the Korean judicial bankruptcy system.

3.2 Performance of the Court-Administered Bankruptcy System Before and After the Reform¹⁰

Firms go bankrupt because they cannot pay their debts. Once firms go bankrupt, they can enter into either court or out-of-court administered settlements, including corporate reorganization, composition, or workout. But not all firms undergo these rehabilitation programs; some simply remain bankrupt for a prolonged period of time. Most credit is denied to these firms, and transactions thus take place in cash.

From the perspective of designing a corporate bankruptcy system, one of the important issues is how to tell (or to elicit information on) whether the financial distress of the insolvent firm is temporary or persistent. Rehabilitation mechanisms applied to the insolvent firms with persistent distresses are most likely doomed to failure from the start. Rehabilitation must target firms that go bankrupt because of temporary bad luck but that have high potential for recovery. One way to resolve this issue empirically is to analyze the productivity of insolvent firms. We construct total factor productivity measures for the firms in our data set and analyze them to evaluate the performance of the corporate bankruptcy system in place after the economic crisis.¹¹ Specifically, we construct the time series of ailing firm's productivity and compare the productivity distribution of ailing firms for different rehabilitation procedures with an eye on the changes in laws and procedures

¹⁰ This section draws much from Lim, Youngjae(2002).

¹¹ Firm productivity is estimated using the chained-multilateral index number approach. This approach uses a separate reference point for each cross-section of observations and then links the reference points together over time. The reference point for a given time period is constructed as a hypothetical firm. Therefore, the productivity level of each firm in each year is measured relative to the hypothetical firm at the base time period. This approach makes it possible to compare firm productivity levels in panel data sets. We assumed constant returns to scale so that the sum of factor elasticity equals to one.

introduced in 1998 and 1999.

Before examining the effect of the bankruptcy reform on the court-administered bankruptcy system, we construct the bankruptcy cohorts as follows. The insolvent firms in a given year include only those which went bankrupt in that year for the first time, and do not include those which went bankrupt in other years. For instance, the 1997 bankruptcy cohort refers to the failing firms which went bankrupt in 1997 for the first time.

<Tables 7–8> show regressions of productivity on a set of year dummies (not reported) and a dummy variable denoting the 1997 or 1998 bankruptcy cohort interacted with year dummies. Only the particular cohort and the group of solvent firms are included in the sample of each regression. The reported coefficients thus indicate the average productivity differential between the 1997 or 1998 cohort and the group of solvent firms.

<Table 7> shows that for the 1997 (corporate reorganization or composition) cohort, the coefficients reported are negative from 1993 to 2000, and significant from 1995 to 2000. <Table 8> shows a similar result for the 1998 (corporate reorganization or composition) cohort: the coefficients reported are negative from 1993 to 2000, and significant from 1997 to 2000.

Several years before the 1997 and 1998 bankruptcy cohorts went bankrupt and were accepted into one of the rehabilitation programs, their productivity was lower than solvent firms. Having said this, however, the reforms in 1998 appear to have affected the choices of target firms. Remember that one of the important changes in the 1998 revision was the introduction of the economic efficiency criterion. Now, the court compares the going-concern value of the firm with its liquidation value for the initiation of judicial bankruptcy proceedings. Note that the 1998 bankruptcy cohorts suffered less from persistent difficulties than the 1997 cohort. We interpret this result as implying that the 1998 revision had a positive effect on the choice of the target firms for rehabilitation procedures.

The most important finding in this section is as follows. After the post-crisis bankruptcy policy reform, the insolvent firms with persistent difficulties seem less likely to be accepted into the court-administered rehabilitation procedures. This finding is quite suggestive of the fact that the post-crisis bankruptcy policy reform contributed to enhancing the efficiency in resource reallocation process by helping to lessen the exit barriers in the Korean economy.

<Table 7> Productivity Performance of the 1997 Cohort
(Firms undergoing Corporate Reorganization or Composition)

Independent Variables	Dependent Variable
Dummy Variable Denoting a Specific Cohort Interacted with Year Dummies	Productivity
1993	-0.0791634 (-1.35)
1994	-0.0854446 (-1.44)
1995	-0.1333633** (-2.31)
1996	-0.1259469** (-2.16)
1997	-0.2794071** (-4.50)
1998	-0.2570166** (-4.03)
1999	-0.1445766** (-2.10)
2000	-0.1445766** (-2.10)
Year Dummies Included	Yes
Number of Observations	37673

Notes: 1). Numbers in the parenthesis are t-values.

2) * significant at the 10% significance level

** significant at the 5% significance level

Source: Lim, Youngjae (2002)

<Table 8> Productivity Performance of the 1998 Cohort
(Firms undergoing Corporate Reorganization or Composition)

Independent Variables	Dependent Variable
Dummy Variable Denoting a Specific Cohort Interacted with Year Dummies	Productivity
1993	-0.177146 (-0.50)
1994	-0.0489432 (-1.44)
1995	-0.0530042 (-1.59)
1996	-0.0032723 (-0.10)
1997	-0.0770928** (-2.21)
1998	-0.3419695** (-7.79)
1999	-0.170335** (-3.72)
2000	-0.1921046** (-4.01)
Year Dummies Included	Yes
Number of Observations	38222

Notes: 1) Numbers in the parenthesis are t-values.

2) * significant at the 10% significance level

** significant at the 5% significance level

Source: Lim, Youngjae (2002)

CHAPTER 4

Concluding Remarks

The stylized facts on growth over the crisis suggest that predicting post-crisis growth might not be as an easy task as one might think. Particularly, pre-crisis growth performance might be a poor predictor of post-crisis growth. Nevertheless, the evidence from the growth accounting exercise shows that it is worthwhile to pay attention to why TFPG changes, rather than why the pace of capital accumulation changes, in order to understand the post-crisis growth performance of crisis-hit countries such as Korea.

Although this paper focused exclusively on bankruptcy policy reform as one determinant of post-crisis TFPG performance, there might also be other important policies or institutional factors that are potentially important for understanding movements of TFPG. In this sense, it is still premature to make a bold prediction about post-crisis growth in Korea. With this caveat in mind¹², we believe one should not overlook the important changes in the area of bankruptcy policy after the crisis when projecting the future growth of the Korean economy. That is, this paper shows that there has been some progress in the post-crisis bankruptcy policy that had an effect on improving the efficiency of resource reallocation. The post-crisis reform on the court-administered bankruptcy system made economic efficiency criterion replace social or political criterion in selecting target firms for rehabilitation procedures. This kind of change in the way the court-administered bankruptcy system works has far-reaching consequences. This is because one of the most effective disciplines for the pre-bankruptcy informal arrangements comes from that in the court-administered bankruptcy system.

¹² Furthermore, the full-fledged effect of the bankruptcy policy reform is likely to be realized over the longer run, in as much as the bankruptcy policy affects the dynamic efficiency of resource reallocation.

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Appendix: Data Description

1. Growth Accounting in Crisis-Hit Countries in Section 2

The data sources for cross-country growth accounting exercises are as follows. As a measure of output, we used PPP-adjusted real GDP series from Penn World Table Mark 5.6. We extended the series up to 1999 utilizing real GDP growth rates figures from World Development Indicators(WDI). Capital stock series comes from Nehru and Dhareshwar (1993), which have been also extended up to 1999, relying on the information on gross fixed capital formation from WDI. Data on labor input, such as working-age population and economically-active population, also come from WDI.

2. Productivity Dynamics of Distressed Firms in Korea in Section 3

(1) firm-level productivity measure

We use detailed financial information on the firms that have external audit reports. According to the Act on External Audit of Joint-Stock Corporations, a firm with assets of 7 billion Won or more must issue audited financial statements. The data thus include all the firms with assets of 7 billion Won or more. For this data, firm productivity is estimated using the chained-multilateral index number approach.

(2) data on bankruptcy filings by distressed firms

The information on corporate bankruptcy was gathered from such sources as the Courts, Financial Supervisory Service and the Bank of Korea.