Chaebol Capitalism and the Currency-Financial Crisis in Korea

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In the aftermath of the Asian "financial crises", a number of factors have been identified as the culprits in leading to them and intensifying their severity. Among them, "crony capitalism", the "weakness of the banking system pre-crisis", financial liberalization and opening of the capital account, and the nominal exchange rate regime have all been singled out.

But, while all these factors obviously contributed, their relative importance quantitatively, and the interactions between them, are little understood. It is the purpose of this paper to delve, insofar as is feasible, into the contributions of exchange rate depreciation, the weak financial system, financial and capital account liberalization, and "crony capitalism" in leading up to the crisis, and intensifying its severity. For that purpose, we focus on the Korean experience, and trace the roles of the chaebol, the earlier history of credit rationing and the build-up of domestic credit and foreign indebtedness prior to the crisis, the opening of the capital account, and the impact of exchange rate depreciation on the crisis.

It is important to understand the role and relative importance of each of the key variables. If, for example, exchange rate depreciation was forced as the consequence of maintaining an unsustainable nominal exchange rate for a long period of time prior to the crisis and was quantitatively the largest factor in leading to the deterioration of the banks' portfolios, resort in the future to a genuinely floating exchange rate and/or preventing uncovered liabilities denominated in foreign exchange should greatly

reduce the likelihood of future crises. Likewise, if bank lending practices would have resulted in a rapidly increasing proportion of nonperforming loans (NPLs) in the banking system even had the exchange rate not been a significant factor, the relative importance of improving bank lending practices as a preventive measure for future crises looms much larger.[1] And if rigidities in the banking/financial system, resulting from failure to liberalize and/or regulate sufficiently, were a major contributing factor, the policy lessons would focus on the urgent need for liberalizing and strengthening banking and financial systems in emerging markets.

In a first section, we briefly sketch the roles that each of these factors can play in theory in financial crises. We then provide background on the Korean economy and the evolution of the banking and financial systems, the chaebol, and linkages to the international economy which are essential building blocks for our later analysis. Section 3 then examines the history of financing of the chaebol and their role in the Korean economy. A fourth section then exmines the financial structure and performance of the chaebol and the the banking system. A fifth section then considers the role of foreign-currency denominated debt in intensifying the crisis. A final section then provides our best judgment as to the relative importance of the variables widely pointed to as contributing to crisis.

l. Domestic Credit Expansion, Lending to Chaebol and/or Cronies, Exchange Rate Depreciation, Capital Account Opening and Crises.

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[1] In some countries, NPLs increase because of lending to the politically well-connected, who apparently do not expect, and are not expected, to repay. In Korea, however, the "cronyism" concerns surrounding bank lending focus on the lending by the banks to the large chaebol. Earlier lending to them had been sound, as will be seen, although as will be seen, government officials supported lending to the chaebol by the banks when their profitability was falling sharply in the pre-crisis period.

As the title of this section suggests, the problem for analysis of the Asian crises is not the lack of explanations: it is that there are too many. In those crises, and in the Mexican crisis of l994, a foreign exchange crisis and a financial crisis occurred almost simultaneously, and have come to be termed "twin crises". As will be seen, there are a number of reasons to anticipate that these twin crises are likely to have a far more severe impact on a domestic economy than either a financial or a currency crisis alone, and it is not coincidental that their onset is virtually simultaneous.

In this section, we briefly review the role of each of the possible causal factors in precipitating and intensifying twin crises. Once that is done, focus turns to interactions between them. Thereafter, we attempt to assess how important these factors were, and the quantitative magnitude of the interactions.

1. Exchange Rate Pegging. Although any nominal exchange rate could, in theory, be associated with the appropriate real exchange rate,[2] empirical evidence shows that governmental policies with respect to nominal exchange rates over periods of 3-5 years, if not longer, significantly affect real exchange rates. Whether this is because of long lags in adjustment or because of the unwillingness of the domestic authorities to adopt the monetary and fiscal policies consistent with their choice of nominal exchange rate is not relevant for present purposes.

Empirically, if the authorities intervene in the foreign exchange market for purposes other than smoothing short-term fluctuations (such as maintaining a fixed nominal exchange rate), the real exchange rate appreciates relative to major trading partners when domestic inflation exceeds the inflation rate in the partner countries. Likewise, if for any reason (such as changes in the terms of trade or rapid growth of

[2] This would require that the domestic authorities refrain from using monetary and fiscal policies in pursuit of domestic economic objectives and instead allowed inflation or deflation to occur as the "equilibrium" real exchange rate changed. Thus, if from an initial position of balance, the terms of trade deteriorated and warranted a real depreciation of the currency, the domestic price level would have to be allowed to decline to achieve that real depreciation.

domestic demand for imports) the real exchange rate would adjust in a well-functioning free market but is prevented from doing so, there can be imbalances between the demand for, and supply of, foreign exchange. As long as the authorities can meet this demand, buying or selling foreign exchange as demanded, they can maintain their exchange rate policy.

All of the countries afflicted with twin crises in the l990s had intervened heavily in their foreign exchange market in one way or another to achieve target nominal exchange rates. In the cases of Mexico and Thailand, the nominal exchange rate had either been fixed, or adjusted according to a formula which resulted in significant appreciation of the real exchange rate. In Indonesia and Korea, terms of trade shocks probably called for a significant real exchange rate depreciation at a time when there was some degree of real appreciation - as will be seen below for Korea.

When government officials implicitly or explicitly indicate that they will maintain an exchange rate policy that results in an appreciating currency in real terms, they provide individuals and firms with a strong incentive to access the international capital market - the real interest rate is typically lower than in the domestic market.[3] When domestic residents have access to the foreign capital market, or when domestic banks can borrow abroad, the result is an increase in the nation's liabilities, and exchange rate policy means that the government is increasing its contingent liabilities. The unsustainability of the nominal exchange rate policy results in a buildup of domestic credit and foreign liabilities until the time when either domestic residents and foreigners anticipate that the exchange rate will alter and attempt to get out of domestic money and into foreign currency and/or the public or private debt-servicing obligations denominated in foreign exchange are not voluntarily met. At that point, either the "run on the currency"

results in a "currency crisis" or the prospective inability to continue voluntary debt-servicing forces the same outcome. Resolving the crisis almost always involves an alteration in the exchange rate, and usually in exchange-rate policy.[4]

It should be noted here that there can be a "pure" currency crisis, without a financial crisis. The normal precondition for this outcome is a reasonably sound banking/financial system at the time of the onset of the currency crisis, or a pre-existing highly restrictive set of capital controls that prevented the buildup of significant foreign indebtedness. Brazil's devaluation in l999 is one good example of a currency crisis in which there was no serious domestic financial spillover.

2. Crony Capitalism and Crisis. If there is a continuing build-up of nonperforming loans (NPLs) in the banking system, a financial crisis will result unless effective measures are taken to reverse the build-up. NPLs can come about for several reasons: l) there can be an unforeseen macroeconomic disturbance (originating abroad or domestically) that leads to unfavorable outcomes for borrowers; 2) domestic credit expansion may be so rapid that banks are unwilling or unable to exercise normal prudence in lending and a disproportionate number of borrowers fail to be able to service their debts (often after a macroeconomic downturn); 3) banks may be directed or induced to lend to politically well-connected cronies, who do not service their outstanding loans; and, finally, 4) banks may lend to favored (economically important) enterprises who do not or cannot service their debt obligations. This last case includes the circumstance in which banks provide "evergreen" accounts for large businesses

[3] Lowering the domestic nominal interest rate would result in more domestic inflation and is thus eschewed by the authorities. See Krueger (1997) for calculation of Mexican real interest rates during the pre-crisis period when a nominal anchor exchange rate policy was followed.

[4] It should be noted that not all exchange rate changes will immediately quell the crisis. In the Mexican case, there was already a significant capital outflow when the authorities announced a nominal devaluation. In the view of most market participants, the magnitude of the announced devaluation was too small and the run on the currency intensified. It was not until the exchange rate was permitted to float that the immediate crisis subsided.

that are indebted to them, rolling over existing debt and extending credits to finance interest payments on it.

For Indonesia, it is thought that the third explanation - obligatory lending to politically well-connected friends and relatives of the President was a significant factor in the NPLs of the banking system. In Thailand (and to a degree in Korea as will be seen below), rapid expansion of domestic credit, certainly at least somewhat associated with the fixed nominal exchange rate, was a major culprit. In Japan in the late l980s, where currency crisis was not a factor, a large negative macroeconomic shock when the rapid inflation of asset prices was reversed, was the trigger for difficulties in the banking system. Probably the best case of the last explanation, lending to favored enterprises and evergreening their accounts, is the Korean case, to be discussed below.

Here, the important point is that once NPLs become significant in a bank's portfolios, serious difficulties are likely to result in the absence of sufficient provisioning or capital. A bank with sizable NPLs must charge higher interest rates on its lending in order to cover its costs over a smaller proportion of its business. As such, if it has more NPLs than its competitors, only those unable to obtain cheaper credit at banks with healthier balance sheets will borrow from it, thus increasing the riskiness of its portfolio. At the same time, as depositors learn of the bank's difficulties, they are likely to attempt to withdraw their deposits.

When many domestic banks have these difficulties at the same time, domestic credit can contract sharply. If there are foreign competitors (or if creditworthy borrowers can borrow abroad), the entire domestic banking system can be threatened.

3. Domestic Credit Expansion. Domestic credit can expand unduly rapidly because of government direction of credit to cronies or to favored enterprises. But it can also expand rapidly

because of the incentives provided by the exchange rate regime, or simply because government monetary and fiscal policy is very loose for whatever reason. Rapid expansion of credit is dangerous: on one hand, it is inflationary which means that for a while, a permissive environment will enable borrowers to service their debts until tighter monetary policy is adopted to curb the resulting inflation; on the other hand, accelerated lending is associated with a deteriorating quality of borrower, both because there are simply not enough sound borrowers to finance such a rapid expansion and because banks do not have the capacity to evaluate lending at such an increasing rate.

Rapid expansion of domestic credit was a feature of the pre-crisis period in Mexico, Indonesia, Thailand, Malaysia, and Korea. In the Indonesian case, the expansion of domestic credit exceeded 20 percent of GDP in the pre-crisis years.

4. Capital Account Liberalization. Many observers have blamed the opening of the capital account for the twin crises of the l990s. The simple argument goes that without an open capital account, indebtedness could not have built up. However, there have been many experiences with foreign exchange crises in countries where the capital account was relatively closed. The degree to which cross-border financial flows must be regulated to prevent speculative flows when exchange rates are greatly misaligned is more restrictive than is compatible with a relatively open trading regime.

Moreover, there are many countries with open capital accounts that have not experienced the difficulties that the Asian countries did. Economies such as those of Taiwan and Singapore, where there were current account surpluses and high levels of foreign exchange reserves relative to trade volumes, did not experience difficulties.

To the extent the opening of the capital account results in difficulties, there are more complex avenues than those associated with real appreciation of the currency.. First, when the capital account is open and

the nominal exchange rate is fixed without appropriate supportive monetary and fiscal policies as discussed above, there are strong incentives for banks and/or private entities to incur foreign-exchange denominated liabilities (capital inflow) because of lower borrowing costs. When they view the government as having guaranteed the exchange rate, they may not match their future foreign exchange liabilities with foreign exchange assets. Second, banks may not have sufficient incentives for appropriate prudence in their lending policies, due either to a lack of capital adequacy (and existing NPLs) or to an absence of appropriate supervision.

In the first case, it would appear that the exchange rate regime is the real culprit; in the second, it is weaknesses in the domestic financial system which become exacerbated with the opening of the capital account.

2. The Korean Economy, the Chaebol, Credit Rationing and Growth.

Korean Economic Growth after 1960. As is well known, Korea was one of the poorest countries in the world in the late 1950s, and was then widely regarded as a country without serious growth prospects. After economic policy reforms began in the early 1960s, Korea began growing at sustained rates previously unheard of in world history.[5] Real GDP grew at an average annual rate of 10 percent per annum in the decade starting 1963. High growth rates continued into the 1990s, and Korea's real per capita income in the mid-1990s was nearly 9 times what it had been in the early 1960s. (see Figiure 1).

[5] Taiwan's rate of economic growth was equally rapid. Prior to the crisis of the late 1990s, most observers would have claimed that the major difference between the Taiwanese and Korean economies was the relatively small scale of Taiwanese enterprises contrasted with the large share of the Korean chaebol in the Korean economy. But there were other differences: perhaps because of greater strategic insecurity, the Taiwanese held very large foreign exchange reserves in relation to the size of their trade or their economy; the Taiwanese dollar showed no tendency for real appreciation; and Taiwan's current account had been consistently in surplus. The Taiwanese financial system

Economic liberalization took place throughout the first 35 years of Korea's rapid growth. In l960, the country had had the usual developing-country mix of an overvalued exchange rate supported by quantitative restrictions on imports (and a black market in foreign exchange), consequent high walls of protection for domestic manufacturers, price controls on many key commodities, credit rationing, a large fiscal deficit, one of the highest rates of inflation in the world and a huge (averaging around 9 percent of GDP over the period l953-58) current account deficit financed largely by foreign aid inflows.[6]

First steps in reform included moving to a more realistic (and constant real) exchange rate for exports, and the relaxation of restrictions on importing by exporters. Thereafter, imports were liberalized further in the late l960s and the exchange regime was unified by that time. Other major reforms also took place, including a major fiscal and tax reform in l964, gradual removal of price controls, a shift from a regime discriminating against agriculture to a protective one, and further liberalization of the trade regime. In the later l960s, quantitative restrictions on imports were greatly eased; tariffs were lowered in several steps; and further trade liberalization took place in the l990s.

In the early years of rapid growth, however, the banking system remained tightly controlled. Even after a reform in l965 (which resulted in a positive real rate of interest for borrowers), credit was rationed and the curb market rate was well above the controlled interest rate.[7] Only in the late l980s did interest rates begin to be deregulated, although the apparent gap between demand and supply of loanable funds was declining over time (see Section 3).

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appears to have been considerably sounder than that of Korea in the late l990s, and the rate of expansion of domestic credit at that time was much lower than that in Korea.

[6] See Krueger (l979) and Frank, Kim and Westphal (l975) for an account of the early period of Korea's rapid development.

[7] See Hong (l98l).

When economic policy reform began, Korea's exports were only about 3 percent of GDP, while imports were about l3 percent. Policy makers therefore began focusing on measures to increase exports. They did so by encouraging all exports uniformly[8], but nonetheless held something that might be regarded as close to an "export theory of value". Any firm that could export was rewarded in proportion to the foreign exchange receipts from exporting. And many of the firms that were initially successful were chaebol (although they were very small at the time and some Korean analysts today do not regard the Hyundais, Samsungs, etc., of the l960s as chaebol at all). Because they were successful, they grew rapidly. They received new loans as their exports grew and as they expanded into new exporting activities.[9] Given the underdeveloped state of the Korean financial markets at that time (and in the absence of measures to strengthen them), access to credit was vital for expansion.

The chaebol were successful exporters and, for the first decade or more of Korean growth, were regarded almost as the 'heroes' of Korean development. They were rewarded for export performance, and were highly profitable. Hong (l979) estimates the real rate of return on capital to have been about 35 percent or more in the first decade following the start of reforms. Although the chaebol were highly profitable and generally encouraged to enter whatever export markets they could, when the authorities wanted a venture undertaken the chaebol were asked to do so. They undertook these ventures with the

[8] All exporters were given an "export subsidy" of a specified number of won per dollar of exports (the number being altered from time to time as conditions were deemed to warrant), an "interest subsidy" and a tax subsidy, each of a given amount per dollar of export. In addition, exporters were permitted to import goods for their use in generous quantities which undoubtedly permitted some profits by using the excess for domestic sales. To a significant degree, these "incentives" offset the duties and other charges on imports, and resulted in reasonably uniform incentives for import-competing and exportable production.

[9] Some of these activities were chosen by the chaebol. On occasion, however, the authorities suggested to chaebol owners that they should move into certain lines of production. This attempt to "pick winners" was not always successful; when it reached its height in the heavy and chemical industry (HCI) drive of the mid-l970s, the rate of economic growth and of export expansion slowed substantially and policies were reversed by the late l970s. When chaebol incurred losses while undertaking these mandated activities, the banks were directed to extend additional credit to the chaebol, thus setting a precedent for later difficulties.

implicit guarantee of the government that credit, tax exemptions, and other support would be available to make the venture profitable.[10] But the chaebol were on the whole remarkably profitable and had little difficulty with servicing their (subsidized) debt.

The extent to which the Korean economy changed structure is remarkable (see Figure 2). Exports and export earnings (the dollar price index of traded goods being stable in the l960s) grew at over 41 percent annually for the period l959-69 and continued growing almost that rapidly thereafter. Exports of goods and services as a percentage of GDP rose from 3 percent in l960 to 14 percent in l970 to 33 percent in l980; imports also rose, from their l0 percent level in l960 to 41 percent of GDP in l980. Hence, the Korean economy was becoming much more open.[11]

At the start of reforms, rationed credit financed a large fraction of new investment, especially in the manufacturing sector. The subsidies implicit in this credit served as a stimulus to industry, and permitted much more rapid expansion than would have been possible had companies had to rely on reinvesting their own profits.[12] Exporters were allocated preferential credit based upon their export performance. The real rate of return was so high that all the chaebol would happily have borrowed more had they been able to; most of them, as reported by Hong (l981) borrowed additional funds at the

[10] It is important to underscore that these government "rewards" were there in the context of the export drive. When chaebol could not produce competitive exports, there was little support. Even in the HCI drive - the most industry-specific interventionist phase of Korean policy - the output from HCI industries was to be exported within a specified period. When it became clear that that performance test was not being passed, the entire thrust of policy was reevaluated.

[11] Some of the increase in imports was of course intermediate goods used in the production of exportables. But the percentage import content of exports remained fairly stable at around 35 percent of the value of exports over the period of rapid growth. From l960 onwards, exporters were entitled to import virtually anything that they might use in producing exp ortables with little paperwork; in addition, they were permitted to imports a "wastage" allowance which they were free to sell on the domestic market. Thus, the de facto liberalization exceeded that which took place because of removal of QRs and lowering of tariffs. With an average tariff rate in the tariff schedule of around l5 percent in l970, average tariff collections as a percent of imports were about 6 percent.

[12] In much of the public discussion of the reliance of firms in crisis countries on borrowing, what seems to be forgotten is that, starting from very low levels of income and development, there is very little equity and a large fraction of investment must therefore be financed through other channels.

much-higher curb market rates. Thus, lending at controlled interest rates was, at least in the early years, equivalent to an intra-marginal subsidy to the chaebol.

Estimates of rates of return suggest that the chaebol were highly profitable at that time even without subsidies. Indeed, given the huge distortions in the economy that prevailed in the late 1950s, it is likely that in the 1960s, at least, almost any reasonably sensible venture into unskilled labor-intensive exportable production had a high real rate of return.

As already mentioned, by the mid-1960s the borrowing rate from the banks was positive in real terms although below a market-clearing rate. Over the following three decades, the banking system was further liberalized as the real interest rate charged for loans rose, and the gap between the controlled rate and what might have cleared the market diminished (see Section 3). At the same time, the real rate of return on investments naturally fell as the very high initial returns obviously could not be sustained. We trace the decline in real returns and the increase in the real cost of credit in the next section.

When policy reforms began in the early 1960s, the Korean savings rate was very low - and even negative by some estimates. As growth accelerated and per capita incomes rose, domestic savings began to increase rapidly, rising from around 0 percent of GDP[13] in 1960 to 18 percent of GDP by 1970 and 24 percent of GDP by 1980 (see Figure 1). But at least until the late 1970s, profitable investment opportunities greatly exceeded domestic savings. As a result, domestic savings were supplemented by borrowing from abroad, equaling as much as 13 percent of GDP in years in the late 1960s.[14] But,

[13] In 1960, it is estimated that private saving was a positive 3.2 percent of GDP while government saving was a negative 2 percent of GDP. Foreign sources financed 78 percent of investment, which was 10 percent of GDP. See Krueger (1979), Pp. 206-7. In 1960, most foreign resources were foreign aid.

[14] Most of the capital inflow was from the private sector - largely commercial bank lending - by the late 1960s. Foreign aid had peaked in 1958 and was less than 2 percent of GDP by the mid-1960s. The current account deficit was sustainable because of the profitability of investment and the declining debt-service ratio that resulted from such rapid growth of exports and of real GDP.

despite the large capital inflows, the debt-service/exports and debt/GDP ratios did not increase because of the rapid rate of growth of export earnings and real GDP.

The Korean government guaranteed these credits, and determined the maximum that could be borrowed, allocating borrowing rights among exporting firms. Since the foreign interest rate was well below the domestic interest rate (especially in the curb market) and the real exchange rate fairly stable for exporters, there was intense competition for foreign loans.

As domestic savings rose, the proportionate reliance on foreign resources for supplementing domestic savings to finance investment fell. By the l980s, the domestic savings rate was in excess of 30 percent, and the current account went into surplus for several years in the mid-l980s.[15] Beginning at this time, the American government in bilateral trade negotiations began to pressure the Koreans to let the won appreciate in order to reduce the bilateral trade surplus with the U.S.[16] Most Korean economists by the mid l990s believed that it would be in Korea's best interest to have some real depreciation of the won, but the pressures not to do so prevented it. While the won exchange rate was not fixed, the range within which it fluctuated was relatively narrow: it appreciated from 890 won per dollar at the end of l985 to 679 won per dollar in l989, and thereafter gradually depreciated to 808 won per dollar in l993, appreciating again to 788 won per dollar in l995. At the end of l996 it stood at 844 per dollar, and of

[15] Korean policy makers viewed the emergence of the current account surplus as a transitory phenomenon explicable by "three lows": the fall in oil prices in the mid-l980s, the drop in world interest rates (so that debt-servicing costs declined), and low dollar (or high yen). The current account turned positive in l986, rose to a peak of 8.5 percent of GDP in l988, fell to 2.4 percent of GDP in l989, and turned negative (-0.5 percent) in l990 and remained negative in the 1-2 percent range until l997 when the deficit increased to 4.7 percent of GDP.

[16] Korea was running a bilateral surplus with the U.S. and a bilateral deficit with Japan, and policy makers resisted as far as they could these pressures. One response was to ask the American authorities whether they should devalue with respect to the yen while they appreciated with respect to the U.S. dollar!

course depreciated almost 50 percent in l997.[17] But, for the decade prior to the l997 crisis, there had been little change in the real exchange rate.

Thus, by the mid-l990s, Korea had sustained three and a half decades of rapid growth. While there had been periods of difficulty - both slowdowns and overheating - Korean policy makers had met their challenges successfully. As noted by the OECD, the country had come from being one of the poorest developing countries in l960 to having a per capita income equal to some OECD countries, with a higher rate of economic growth.[18]

The late l980s had witnessed the introduction of a democratic process into Korea. The elected governments chose to liberalize further, including especially the financial sector and international capital flows.[19] In l992-3 there was a "growth recession", as the growth rate slowed to just over 5 percent (contrasted with rates over 9 percent in the preceding two years and an average rate above 8 percent in the preceding decade). One response was to ease monetary policy: domestic credit expanded by over l8 percent in l994, l4 percent in l995, and 2l percent in l996.[20] Real GDP growth responded, exceeding 8 percent in l994 and l995. But, as will be argued in Section 3, underlying weaknesses were not addressed, and the stimulus to the economy, through expansion of domestic credit and other measures, increased the vulnerability of the financial system later on.

The Crisis. Export earnings failed to maintain their growth rate in l996, increasing only 3 percent in dollar terms, as falling prices for semiconductors and a number of other factors resulted in the

[17] Exchange rates, savings rates, and current account deficit data are all taken from various issues of the IMF's International Financial Statistics unless otherwise noted.
[18] For an account of the Korean economy in the mid-l990s reflecting this consensus view, see O.E. C. D. (1994).
[19] See the O.E.C.D. (l994) description of the five-year financial liberalization plan.
[20] This rate was not markedly faster, however, than it had been over the entire preceding decade. Hahm and Mishkin (l999, P. 21) reject the notion that liberalization of the capital account was responsible for the increase in domestic credit, but note that it did play a role in permitting the banks to take on greater exposures to foreign exchange risk.

slowdown. Then, a number of events took place early in l997 that surely eroded confidence. One of the large chaebol, Hanbo, went bankrupt early in the year. Given that it had been widely believed that the large chaebol were "too big to fail", this in and of itself must have resulted in some loss of confidence and a reexamination of Korea's creditworthiness. Moreover, l997 was an election year, with the Presidential elections set to be held early in December. That the market anticipated difficulties is reflected in the fact that the Korean stock exchange index fell from 981 in April l996 to 677 by the end of March l997 and to 47l at the end of October, even before the outbreak of the currency crisis.

However, while the net and gross foreign (and especially short-term) liabilities of the banking and financial systems were continuing to increase, there was no visible evidence of crisis until the final quarter of the year. The Thai crisis had exploded in June, and the Indonesian crisis had begun during the summer of l997, but most foreign observers were confident, given Korea's past history, that Korea would not be affected.[21] Korea's offshore banks were holding paper from Indonesia, Russia, and other countries with dollar liabilities, which would further deteriorate the net foreign asset position, but that was not widely known at the time.

However, capital flight began early in the fourth quarter of the year. In many instances, it was simply a refusal to roll over short-term debt. But other factors contributed: Korea's sovereign risk status was downgraded by Standard and Poor's in October; reported NPLs in the banking system doubled from the end of l996 to fourth quarter l998, reaching 7.5 percent of total loans by that time, owing largely to the bankruptcy of six chaebols and the sharp drop in the Korean stock exchange. But, once it became known that reserves were decreasing, others sought to get out of won, and the capital outflow

[21] However, many Korean economists and policy analysts were very concerned. One of us (Krueger) author was at a conference of Korean economic policy makers in August l997 and the mood was one of deep gloom. Many of the

intensified rapidly.[22] Total reserves less overseas branch deposits and other unusable foreign exchange were $22.3 billion at the end of October and fell to $7.3 billion by the end of November.[23] It is reported that, by the time the IMF was approached, gross reserves were being depleted at a rate so rapid that they would have approached zero within 48 hours. In the program presented to the IMF Board, it was reported that usable reserves had dropped from $22.5 billion on October 31 to $13 billion on November 21, and $6 billion on December 2.[24]

The IMF Program.[25] All three Presidential candidates had declared repeatedly that under no circumstances would they approach the IMF. When the government did approach the IMF, the IMF's problem was complicated by several things: l) it was not known who the new president would be, and hence with whom the IMF would have to deal on the economics team; 2) there was very little time to put together a program, and both because Korea had been viewed as "sound" until recently and because the candidates had all said they would not approach the Fund, there had been less preliminary work done than was usually the case;[26] 3) the exchange rate was depreciating sharply after the end of October, and when the band was widened to l0 percent on November l9, the rate of depreciation began accelerating rapidly; and 4) as already mentioned, the government was rapidly running out of

participants were extremely pessimistic about the chaebol, the state of the financial system, and the potential for reforms of economic policy.

[22] However, even in November, the Finance Ministry was issuing reassuring statements, and private forecasters were minimizing the likelihood that Korea would approach the IMF. For a representative account, see Financial Times, November l2, l997, P. 5, John Burton, "Koren Currency Slide Shakes Economy".

[23] Data are from Hahm and Mishkin (l999), Table ll.

[24] Other factors also contributed. A financial reform bill, proposed by a blue ribbon committee, had been turned down by Parliament, and it was not clear whether the government had legally guaranteed the foreign exchange liabilities of the financial institutions. While interest rates had risen by about 200 basis points, the Bank of Korea was nonetheless injecting liquidity into the system which reversed the increase.

[25] The IMF documents cited in this section may be found at http://www.imf.org/external/country/KOR/index.htm.

[26] The fact that the Thai and Indonesian crises had already occurred no doubt diverted some of the attention that Korea otherwise might have received. At that time, too, it must have been anticipated that there would be Malaysian and Philippine programs.

foreign exchange reserves, and would soon be forced to default on its obligations.[27] The high short-term indebtedness meant that foreigners could get out of won simply by refusing to roll over outstanding debt.[28]

The first (hastily put-together) program set forth as its objectives: "building the conditions for an early return of confidence so as to limit the deceleration of real GDP growth to about 3 percent of GDP in l998, followed by a recovery towards potential in l999; containing inflation at or below 5 percent; and building international reserves to more than two months of imports by end-l998."[29] The staff memorandum stated that there were three pillars to the government's program: the macroeconomic framework;[30] restructuring and recapitalizing the financial sector; and reducing reliance of corporations and financial institutions on short-term debt.

For present purposes, the specifics of the Fund program are not relevant. However, understanding those aspects of the Program that were important in affecting the severity of the downturn is necessary, if an assessment of the role of the various factors leading in the downturn is to be made. In attempting to stem the speculative pressures, the exchange rate was allowed to float, and the won depreciated from the mid-800s level per dollar to almost l800 per U.S. dollar.[31] The liquidity which

[27] See Boughton (l998).

[28] Hahm and Mishkin (l999) point out that "the speculative attack was not in the usual form of direct currency attack to exploit expected depreciation. Due to the tight regulation on currency forwards which should be backed by corresponding current account transactions and the absence of currency futures markets inside Korea at the time, opportunities for direct speculative attack had been much limited. Rather, the drastic depreciation of Korean won was driven by foreign creditors' run on Korean financial institutions and chaebols to collect their loans, and by foreign investors to exit from the Korean stock market." (P. 25)

[29] IMF, Korea. "Request for Standby", P. 5. December 3, l997.

[30] Much of the controversy surrounding the Korean program centers on whether the program tightened fiscal policy too much. This is discussed below. It should be noted that the Fund staff's introduction of the macroeconomic program indicated that the program would involve "a tighter monetary stance and significant fiscal adjustment". (P. 5).

[31] As stated in the Request for Standby, "The inflation target reflects a very limited pass-through of the recent depreciation of the won to the aggregate price level…In order to achieve the inflation objective, the government will

had been introduced into the financial system in prior weeks (in an effort to support the chaebol) was removed, and money market rates were raised sharply. In the words of the staff these rates would "be maintained at as high a level as needed to stabilize markets" (p. 5). Day-to-day monetary policy was to be geared to exchange rate and short-term interest rate movements, while exchange rate policy was to be flexible with intervention "limited to smoothing operations".

The l998 budget as passed by the government had projected a surplus of about 0.25 percent of GDP. But Fund staff estimated that lower growth and the altered exchange rate would reduce the balance by 0.8 percent of GDP, and that it would require 5.5 percent of GDP to recapitalize the banks to meet the Basle minimum capital standards. It was assumed that these funds would have to be borrowed, and interest costs (0.8 percent of GDP) were therefore also included in the altered budget estimates. These factors would, on Fund estimates, have shifted the fiscal account into deficit to about l.5 percent of GDP in l998. As stated by staff, "In order to prevent such a deficit and alleviate the burden on monetary policy in the overall macroeconomic adjustment, fiscal policy will be tightened to achieve at least balance and, preferably, a small surplus." The program therefore called for fiscal changes approximately offsetting the negative anticipated changes, and thus for maintenance of the fiscal stance as anticipated prior to the crisis, with the l.5 percent of GDP cuts equally distributed between government expenditures

and revenues. The government initially raised some taxes to yield about 0.5 percent of GDP.

The second leg of the program was financial restructuring. As already indicated, NPLs were large and increasing prior to the crisis. The depreciation of the exchange rate increased debt-servicing

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aim to reduce broad money growth (M3) from an estimated l6.4 percent at end-September to l5.4 percent at end-December l997, and to a rate consistent with the inflation objective in l998." (p. 5-6).

obligations for chaebol and financial institutions, as did the increase in interest rates that came about with monetary tightening. An exit policy was to be adopted to close down weak financial institutions, and the remaining banks were to be recapitalized (through merger or other means). A deposit guarantee was to be phased out at the end of December 2000 and replaced with deposit insurance for small depositors only.[32]

Bank restructuring required a prior, or at least concurrent, restructuring of the chaebols' finances. Given their very high debt-equity ratios[33] (for one chaebol at the height of the crisis, the debt-equity ratio reached l2:l), financial viability where feasible at all would surely require swaps of debt by the chaebol to the banks, giving the banks equity in return. For this reason, it was predictable that it would require time. Data on the finances of the chaebol are given in Section 3.

The stand-by also addressed corporate governance and corporate-financial-structure issues, focusing on improving incentives and supervision for banking operations and reforming bankruptcy laws. The government also agreed to refrain from providing financial support, providing tax privileges, or forcing mergers for individual companies.

A final issue of concern here is the projected magnitude of the financial support for the Korean program. The current account deficit was expected to decline markedly in l997 to about 3 percent of GDP, and then - with export growth and won depreciation - to about 0.5 percent of GDP in l998.

[32] There were a number of other significant measures, which are less important for present purposes. For example, transparency was to be increased in a variety of ways. Large firms were to be audited by international accounting houses. Supervisory functions were to be reorganized and the Bank of Korea was given much greater independence. Importantly, the government undertook to refrain from attempting to influence lending decisions, leaving those to the financial institutions. But these actions had little impact on the short-run downturn.

[33] These high debt-equity ratios were public knowledge. The Financial Times published data on debt-equity ratios for 20 chaebol on August 8, l997. The highest was Sammi with 33.3 times as much debt as equity; Jinro had 85 times as much debt as equity and Halla 20 times; Hyundai's debt was 4.4 times its equity, and so on. Profits were relatively small as a percentage of assets or sales. In Samsung's case, for example, net profits were l79.5 billion won on sales of

However, the very high level of short-term debt was seen to be worrisome. As stated in the standby, "It is difficult to estimate with any certainty the likely developments in capital flows…, given the uncertainty surrounding the rolling over of private sector short-term debt and the recent collapse in market confidence…. The working assumption is that, on the basis of the beneficial effects on market confidence of the announced program and the large financing package, the bulk of the short-term debt will be rolled over. Under this scenario, the purpose of the exceptional financing would be largely to reconstitute reserves. For this outcome to materialize, it is critical that the financing package provided is adequately large and the program is perceived to be strong. It is anticipated that a comprehensive financing package of about $55 billion will be provided on a multilateral and bilateral basis…"(p. 12).

The Severity of the Crisis. For at least two weeks after the announcement of the Fund program, questions remained as to whether the downward slide had been halted.[34] By late December, however, the exchange rate had stabilized, and by mid-January, foreign banks announced a $24 billion package of rollovers and new money.[35]

Domestic economic activity slowed markedly in l998. For the year as a whole, real GDP fell 6.7 by percent, contrasted with the Fund's projected 3 percent. The unemployment rate, which had been 2.2 percent at the end of the third quarter of l997 rose throughout l998 and peaked in the first quarter of l999 at 8.4 percent. The seasonally adjusted industrial production index fell by l5 percent from the end of l997 to the second quarter of l998. Thereafter, it rose, reaching its pre-crisis level by the end of l998 and l44.9 at the end of l999.

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60 trillion won and total assets of 5l trillion won. Nine of the 20 chaebol listed in the Financial Times on that day had taken losses.

[34] Because of this, it is very difficult to accept the argument that the Fund program was "too stringent'. Indeed, given those uncertainties it is more plausible to argue that the program might have been even more restrictive initially.

[35] Financial Times, January 30, l998, P. ll.

The external accounts improved markedly. There was a sharp drop in imports in immediate response to the crisis, and a much-increased current account balance: while exports were slightly lower in dollar terms in l998 than in l997, imports fell 22.4 percent and the current account balance was equal to an astonishing l2.5 percent of GDP for the year. Foreign exchange reserves rose in response, reaching $74 billion by the end of l999 and $83.6 billion by the end of the first quarter of 2000. The decline in real GDP ended in mid-l998, and by the end of the year, real GDP had exceeded its pre-crisis level. For l999, real GDP growth exceeded 9 percent, and is projected to attain that same rate for 2000.

After early l998, the nominal exchange rate appreciated in dollar terms, entering the year 2000 at around 1100 to the dollar, contrasted with l800 to the dollar at the peak of the crisis. Moreover, prices at the end of l998 were about 7 percent higher than at the end of 1997; in 1999 the rate of inflation was just 0.8 percent, as measured by the consumer price index.

Progress in restructuring the financial sector was necessarily considerably slower. Although interest rates had fallen below their pre-crisis levels by the end of l999, restructuring of chaebol and financial institutions met considerable resistance.[36] Government policy pronouncements and actions have continued to push reforms, but the pace of reform has been much slower than with regard to the balance of payments and external finances.

[36] See, for example, Financial Times, November 23, l998, P. l7, "Boxed into a Corner", by John Burton, where the header read "South Korea's chaebol are fighting a stiff rearguard action against government reforms but the conglomerates are being forced to change their ways".

But by any measure, the negative impact of the crisis and measures to address it was felt most heavily in l998. By early 2000, the Korean recovery was more rapid and more pronounced than had been anticipated by any.[37]

3. Estimating the Role of Financial and Other Variables in Leading to Crisis.

Financial restructuring was absolutely essential - first to make the reforms credible (or capital outflows would have continued) and second as a prerequisite for economic recovery. And because the devaluation and higher interest rates would both weaken the financial sector in the short run (and this was understood by the markets), failure to address the issue of financial restructuring would clearly have increased the severity of the recession and delayed, if not aborted, the recovery. And financial restructuring could not be satisfactorily undertaken without addressing the very high debt/equity ratios of the chaebol. How much this intensified the downturn however, cannot be addressed until consideration of the finances of the chaebol and the financial system are considered

Either a financial crisis or a currency crisis must be addressed with measures that will cause economic pain in the short run. But when the two interact, the resulting costs are much higher. To see how this played out in Korea, we start with an examination of the finances of the chaebol prior to late l997. An overview of their evolution, and the problems that developed, will be useful before turning to detail. As mentioned earlier, the chaebol had earlier contributed enormously to Korea's rapid economic growth. By the early l990s, the largest 30 chaebol accounted for 49 percent of assets and 42 percent of sales in the manufacturing sector. While they had received subsidized credit, this implicit subsidy was probably mostly intramarginal in the l960s and l970s, and probably simply increased overall profitability

[37] This is not to say that corporate and financial restructuring had been completed. At the time of writing in late 2000, unprofitable chaebol activities, including some large entities are still being closed down, with attendant concerns

and reinvestment rates. However, over time, the chaebols' profitability necessarily diminished, while the real interest rate at which they borrowed was increasing.

Table 1 gives data on lending rates of deposit money banks from l96l to l987, the period during which interest rates were controlled. In l987, the quantity of regulated loans was sharply reduced, and the Bank of Korea stopped reporting the interest rates by those loan categories separately. To estimate how much of a subsidy was involved in Deposit Money Banks (DMBs) lending, it is necessary to contrast that rate with an estimate of what a market-clearing real interest rate might have been.[38] To that end, Table 2 gives the curb market interest rates, the inflation rates, and the growth rates over the years from l96l to l998. We then construct an estimate of what a realistic real borrowing rate might have been by adding the inflation rate to the growth rate and calculating a three-year moving average.

Table 3 then gives the DMB loans enjoying preferential interest rates, by type of loan. The last column gives these loans as a percentage of the total. As can be seen, they peaked in the late l970s (which coincided with the HCI drive), but were sizable during the l980s as well. Only in the l990s after interest rate liberalization did their share drop to less than 5 percent of outstanding loans.

We then derive estimates of the subsidy through DMB loans in the first column of Table 4. The estimates are made by multiplying the volume of DMB loans with the difference between the reference interest rate and the actual borrowing rate. Also shown in Table 4 are similarly derived estimates of the subsidy through loans to the manufacturing sector from the Korea Development Bank, a non-bank financial institution which lent for investment in public utilities, infrastructure, equipment for

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about a slowing down of the rate of growth in 200l.

[38] The curb market rate, given in column l of Table 4, provides an alternate "reference interest rate". As can be seen, the estimated subsidy to borrowers would be considerably higher if the difference between the borrowing rates and the curb market rate were used. The two move together, however, and it seems reasonable that some part of the curb

manufacturing, and other purchases deemed desirable for developmental purposes. The sum of these estimates should be compared with the final column of Table 4, which gives the estimates of all manufacturing firms' ordinary incomes (that reported on their balance sheets). As can be seen, the estimated subsidy component of loans exceeded ordinary income in some years, and represented a substantial portion of it in others.

There was almost certainly an element of subsidy in bank lending after l988 and even in lending at nonpreferential rates prior to that date. Estimating its magnitude is considerably more difficult, as there are no records of the interest rates at which loans were extended. An estimate was made, using the "lending rate" reported by the IMF in International Financial Statistics, and taking the difference between the reference rate and that rate times the volume of loans outstanding. The results of those estimates are reported in Appendix Table 3. Unlike the estimates used here, those estimates probably represent upper bounds as to the magnitude of the subsidy implicit in bank loans both because some loans may have been extended at higher interest rates and because the reference rate may overstate the "true" interest rate, especially during periods of falling inflation. Nonetheless, even by our most conservative measure, the subsidy component of lending was large, and constituted an important element of reported profits for the chaebol.

Figure 3 shows the rates of return on assets and on equity in manufacturing from l962 to l997. For the l962-82 period for which we have estimates of the subsidy component of loans, estimates are given as to the rates of return that would have prevailed all else equal had there been no subsidy implicit in borrowing. Three things should be noted. First, there were declining rates of return over time.

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market rate would have been to adjust for additional risk. Our estimates of the implicit subsidy must, however, probably be taken as a lower bound on the value of loans to their recipients.

Second, there were earlier periods during which the returns to firms would have been negative had it not been for the subsidized credit. Third, it is small wonder that chaebol were highly leveraged: given the incentive to use debt financing entailed in the loans, they were more profitable for doing so, and their founders could retain a stronger controlling interest.

4. The Status of the Banking System and the Chaebol Finances at the Time of the Crisis.

There is little doubt that the chaebol had strong incentives to rely on credit rather than equity as much as they could for many years. The next step in the analysis is to consider the chaebol and their profitability in the years leading up to the crisis. Figure 4 shows the debt-equity ratios for "Big 5", the largest 5 chaebol, and for all manufacturing firms.[39] The debt-equity ratios are given for Japan and the United States as well, for purposes of comparison. The ratios for all firms included in the largest 30 chaebol are provided in Appendix Table 5 in the column labeled "Korea Big 30 all firms".

As can be seen, and as is consistent with the incentives with which they were confronted, the financial structures of the Korean firms were in general highly leveraged. The manufacturing firms had a debt equivalent to 3.5 times their equity in the mid-l980s. While this ratio declined somewhat in the l990s, it was usually two or three times higher than those in the U.S. Chaebol firms were even more highly leveraged than Korean manufacturing as a whole.[40]

Obviously, highly leveraged firms are vulnerable to shocks, such as increases in the cost of capital, sharp changes in macroeconomic conditions, and sudden drops in foreign demand. The

[39] The Fair Trade Commission (FTC) of the Korean government each year designates the 30 largest chaebol in terms of assets and lists the firms belonging to them. The list changes over time. The list used in this paper is the same for each year as that which the FTC designates, and therefore changes over time. The Big 5 are Hyundai, Samsung, Daewoo, LG and SK.

[40] The debt-equity ratios, rates of return, and asset growth rates were estimated on the basis of financial statements of firms subject to the requirement of external audit, compiled by the National Information and Credit Evaluation agency (NICE). This source is used throughout this paper, unless otherwise noted.

vulnerability of the chaebols was especially dangerous, given their importance to the Korean economy. The situation was even worse as the chaebol firms were closely linked to each other financially. Firms belonging to the same chaebol tended to invest in each other and guarantee the repayment of bank loans for each other. While this may make sense for the individual chaebol, from the economywide viewpoint, there were risks. On one hand, chaebol activities that should have been closed down could continue operating, given financial support from their chaebol affiliates. When difficulties were short-run, this support was evidently warranted. But problems arose because there was little way to determine when difficulties were short-run, and components of the chaebol remained in business regardless of their own situation, reducing the profitability of the chaebol as a whole. Because of this, the high leverage combined with subsidized lending resulted in declining rates of return for chaebol over time.[41]

We turn, then, to the estimated rates of return on assets in Figure 5 and those on equity (Appendix Table 7), for the same comparison groups. The rates of return were also falling during the l990s except for the cyclical boom years of l994 and l995. For all Korean manufacturing, the rate of return on assets fell from an average above 4 percent in the late l980s to under 2 percent in the early l990s, and becoming negative in l997. This contrasts sharply with rates of return in the United States, which were both higher and more sustained (with the exception of the recession years l99l and l992) and Japan, where returns fell but were still about 2.3 percent in l998 - after the impact of the Asian financial crisis. Returns on equity show the same pattern, with more pronounced fluctuations. The pattern for Big 5 was much the same except that the rates of return for the chaebol tended to be lower

[41] It should be noted that the practice not only increased vulnerability and lowered the rates of return for the chaebol, but it also doubtless resulted in the banks turning down loan applications from small firms that might have had very high rates of return.

than for all Korean manufacturing firms over the same period excluding the boom years of 1994 and 1995.

Table 5 gives estimates of the growth rates of assets of the Korean firms. What is striking, given the chaebols' high debt-equity ratios and low rates of returns, is the fact that the growth of their assets has been incomparably more rapid than that of the non-chaebol firms. As can be seen in columns 2 to 4, the Big 30 and Big 5 have been growing at 20 to 30 percent annually since the mid l980s. As a result, their assets in l997 at the time of the financial crisis, were l4 and l9 times, respectively, as large as in l985.[42] The same holds true within the manufacturing sector. While manufacturing as a whole saw its total assets increase 8.5 times, the Big 5's assets rose 20 times and the assets of the firms other than the Big 5 rose 6.5 times.

As a result, chaebols' assets accounted for an increasing proportion of the corporate sector's total. In l985, the Big 5 chaebol firms in the data used here held l6 percent of the assets in the manufacturing sector; the proportion rose to 40 percent in l997.

The disproportionate increase in lending to chaebol by the banks, despite their lower returns, seems to reflect the banks' preference for lending to the chaebol in the later period. From the banks' viewpoint, the chaebol were relatively safer borrowers, as they were likely to have better collateral, and repayments were often guaranteed by other member firms of the same chaebol. Indeed, the government intervened and set a minimum quota in bank lending that should go to small and medium-sized firms so that their access to bank credits might not be unduly restricted.

[42] Although Korean inflation was double-digit for some earlier years, it was relatively low during the late l980s and early l990s: most of the increase in assets reflects changes in real variables.

However, government policy was not repressive toward the chaebol. They had come into being supported by policy favors, especially during the so-called Heavy and Chemical Industry Drive of the l970s. For, as they grew in assets, sales, employment, exports, etc., and increased their relative importance in the economy, they became indispensable and appeared "too big to fail".

In this regard, an episode of interest rate cuts in the early l990s provides an interesting case. In January l993 and again in March l993, interest rates were cut. The cuts were the policy response to sharply deteriorating economic conditions, especially falling investment (in part in response to the American recession of l990-91). But it is noteworthy that these cuts coincided with a period of financial difficulty for the chaebols. The ROA of the Big 5 was barely one percent in 1991 (see Figure 5 and Appendix Table 6) and there was a sharp drop in the growth rate of assets in l992 (Table 5).

In two steps, the Bank of Korea lowered the rediscount rates under its control by two percentage points "to counter the slowdown of economic growth and contraction of firms' equipment investment." In line with the slowing growth, the Bank "encouraged" the deposit money banks to lower their loan rates twice, one percentage point each time. Each time, the their loand and deposit rates were reduced. [43]

This is significant because the l993 action was similar to those of earlier years when the ROA had fallen (in l97l and in l980-82). It followed in the tradition of earlier years. If all manufacturing firms, including the chaebol, had had to pay interest on all their debts, their income would have dropped almost 3.6 trillion won, more than wiping out their incomes for that year (see Appendix Table 3). The interest rate cuts preceded the cyclical boom of l994 and l995, when credit expansion in their aftermath resulted in rapid economic growth.

We conclude that, by l997, the chaebol were highly vulnerable to negative shocks. Their profitability had been falling and was low, so that there was little margin for a reduction in cash flow or an increase in debt-servicing costs. Yet debt-servicing obligations were mounting, and cash flow does not appear to have been increasing commensurately. The large increase in lending by the commercial banks would appear to have had a significant element of "evergreening" to it. Had the interest rate risen in l994 or l995 because of macroeconomic conditions, it seems reasonable to conjecture that NPLs would have increased substantially (or evergreening increased significantly) at that time. The chaebol were overleveraged and vulnerable to interest rate increases.[44]

We turn now to the banking side of the picture. Figure 6 shows the rates of return for the commercial banks during the l990s. As can be seen, total assets of the banks rose dramatically during the l992-l997 period, more than tripling. Net income, however, peaked in l994 and turned negative by l997 (Appendix Table 8). The rate of return on assets was falling continuously during the period, as was the rate of return on equity.

Table 6 provides more detail. By l998 the combined net loss of the banks was 46 percent of their equity. The changes up to and including the crisis year reflect three things. The loss provision for non-performing loans (NPLs) peaked in l994 and was declining until it rose sharply in l997 and l998. Provision for valuation loss on securities was steadily increasing. And non-operating income dropped by more than 2.4 trillion won in l997.[45]

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[43] Bank of Korea, Quarterly Economic Review, March l993 (p. l2) and June l993 (p. l4).

[44] Most of the chaebol sold large proportions of their products overseas. For that reason, they were almost surely less vulnerable to exchange rate changes, as their won sales would have increased significantly in response to a currency depreciation.

[45] This loss reflects the losses banks suffered when they had to sell their NPLs to Korea Asset Management Company (KAMCO), a public enterprise charged with clearing the financial institutions' balance sheets of their bad loans.

There was little prior indication of the deterioration in the banks' assets. Interest had been paid, although it is difficult to estimate how much of this may have been "evergreening" accounts by lending to enable chaebol to service their debts. The sudden jump in NPLs in 1997 would seem to suggest that evergreening had been taking place in earlier years.[46]

Not all banks collapsed in 1997, and some had, for all practical purposes, been in difficulty earlier. Table 7 shows the changes in net income in 1993-98 for the six largest nationwide commercial banks. It also gives data on the three factors that contributed most to the income changes. The last column gives the reported NPLs on their balance sheets. As can be seen, Seoul Bank reported virtually zero net income in 1995, and Korea First in 1996 before other banks experienced income losses in 1997. Their plight seems unrelated to the currency crisis in the region or to the sudden and sharp depreciation of the won that occurred in the last month in 1997.

There is thus considerable evidence of a weakening of the quality of the banks' portfolios prior to the crisis, in the sense that the financial health of the borrowers was deteriorating.. Nonetheless, the proportion of NPLs in their portfolios was generally stationary or falling until the crisis, although this may in part have reflected the evergreening of accounts. After the crisis, the proportion of NPLs rose sharply and they were then assumed by the asset management company and the banks booked their losses. The key question is whether those losses were already there and being "evergreened", or whether the events associated with the exchange rate crisis itself precipitated the financial crisis. Certainly, the chaebol were highly leveraged, and a small change in either their profitability or in interest charges would have been enough to tip them into non-performing status.

[46] The NPLs of the commercial banks, as reported were:

1991	1992	1993	1994	1995	1996	1997	1998

5. The Foreign Currency Vulnerability of the Banks

Table 8 gives data on foreign-currency denominated assets and liabilities of the commercial banks, and Appendix Table 9 gives the same data for deposit money banks. As can be seen, foreign-currency denominated assets were slightly below liabilities throughout the l990s for both the commercial banks and the deposit money banks. At their peak in February l998 - post-crisis - commercial banks' liabilities denominated in foreign currency were 25.l percent of total liabilities, while assets were 21.8 percent. The same general pattern held for deposit money banks, although the imbalance between foreign currency assets and liabilities was smaller. Interestingly, both the assets and liabilities had risen by about the same percentage during the crisis months, although the gap between them was about two percent wider in early l998 than it had been in mid-l997.

A question that these data do not answer is the extent to which the quality of the assets and the liabilities were similar. At the time of the crisis, there were reports that many of the loans denominated in foreign currency were to Indonesia, Thailand, and Russia, and that one of the factors precipitating the Korean crisis was the nonperformance of those loans. The data may therefore understate the differential between foreign currency assets and liabilities when risk-adjusted. Even so, it is not evident that the differential was so large that exchange rate changes should have triggered a major decline in the banks' balance sheets. To the extent there was deterioration caused by the exchange-rate change, it would have had to be either in the chaebols' ability to service their outstanding debts or in the failure of foreign debtors to continue servicing their loans to Korean banks.

6. Conclusions

billion won	8.27	10.l6	11.93	11.39	12.48	ll.87	22.85	21.22
percent of loans	7.0	7.l	7.4	5.8	5.2	4.1	6.2	7.4

The chaebol were in a weak financial condition long before the crisis. While the data do not indicate an increase in NPLs, the rapid increase in assets combined with their deteriorating profitability certainly seems to indicate that the banks were "evergreening" the chaebols' outstanding debt. If even a quarter of the net increase in chaebol borrowing from the banks was evergreened, the banks were in very bad shape prior to the Korean crisis in l997.

In an important sense, the vulnerability of the system was extreme. While very favorable conditions - increased semiconductor prices on world markets, falling world interest rates, a pickup in economic activity in the rest of the world - might have prevented the crisis and enabled the chaebol to regain profitability and reduce the degree to which they were leveraged, their behavior during the boom of l994 and l995 does not suggest that they were inclined to do so. Instead, in the boom years, they continued borrowing and increasing their assets, while the rate of return remained low with only a slight cyclical upturn.

The conclusion must be that the Korean crisis was a disaster waiting to happen: when very favorable circumstances did not materialize, the needed increase in evergreening was more rapid than the system could tolerate. The foreign exchange crisis itself probably did not trigger the financial crisis: rather, the increase in interest rates did.

The chaebols' debts to the banks are the chief culprit. And since the chaebol were major exporters, the change in the exchange rate per se probably did not harm their ability to service their debts. However, the increased interest rate clearly did.

In the short run, therefore, more exchange rate depreciation and less interest rate increase - as was in fact the chosen stabilization path - was probably appropriate. Failure to raise the interest rate at all would surely have resulted in larger capital outflows and perpetuated the foreign exchange crisis.

Indeed, as was seen, there were doubts over the several weeks after the first IMF program that the package as undertaken was enough. However, further increases in the interest rate (which probably would have reduced the magnitude of exchange rate depreciation) would surely have intensified the financial crisis.

At an analytical level, the impact of the exchange rate depreciation on the banks' balance sheets either directly or indirectly through the ability of the chaebol to service their debts must be deemed to have been relatively small in the Korean case. The fundamental problem was the magnitude of the leveraging the chaebol had had pre-crisis. That, in turn, made the post-crisis workout of the banking system extremely difficult because of the necessity of restructuring the finances of the chaebol first.

REFERENCES

Bank of Korea, Quarterly Economic Review, various issues

Bank of Korea, Monthly Statistical Bulletin, various issues

Bank of Korea, Financial Statement Analysis, various issues

Boughton, James M., l999. "From Suez to Tequila" The IMF as Crisis Manager", Economic Journal,

Cho, Dongchul and Kenneth D. West, l999. "The Effect of Monetary Policy in Exchange Rate Stabilization in Post-Crisis Korea", KDI Conference on The Korean Crisis: Before and After, l5 October.

Choi, Sung-No, 1995 and 1996, The Analysis of the 30 Korean Big Business Groups, Korea Economic Research Institute, Seoul

Choi, Sung-No, 1997, 1998, and 1999 Big Business Groups in Korea, Center for Free Enterprise, Seoul

Cline, William R. and Sidney Weintraub, editors, l98l. Economic Stabilization in Developing Countries, Brookings Institution, Washington

Cooper, Richard N., l97l, "An Assessment of Currency Devaluation in Developing Countries", Chapter l3 in Gustav Ranis, editor, Government and Economic Development, Yale University Press, New Haven.

Feldstein, Martin, l998. "Refocusing the IMF", Foreign Affairs, Pp.20-33. March/April.

Frank, Charles R. Jr., Kwang Suk Kim, and Larry Westphal, l975. Foreign Trade Regimes and Economic Development: South Korea, Columbia University Press, New York.

Furman, J. and Stiglitz, J.E., l998 "Economic Crises: Evidence and Insights from East Asia", Brookings Papers on Economic Activity, (2). Pp. 1-114.

Hahm, Joon-Ho and Frederic S. Mishkin, l999. "Causes of the Korean Financial Crisis: Lessons for Policy", in Korea Development Institute, The Korean Crisis: Before and After, KDI, Seoul. October.

Harberger, Arnold C., l999. "The Indonesian Crisis Revisited", mimeo. December.

Hong, Wontack, l98l. "Export Promotion and Employment Growth in South Korea", Pp. 341-391 in Anne O. Krueger, Hal B. Lary, Terry Monson and Narongchai Akrasanee, editors, Trade and Employment in Developing Countries, Vol. 1. Individual Studies. *University* of Chicago Press, Chicago.

International Monetary Fund, 1995. International Capital Markets: Developments, Prospects and Policy Issues. Washington, D. C.

James, Harold, l996. International Monetary Cooperation Since Bretton Woods, Oxford University Press, New York.

Krueger, Anne O., l979. The Developmental Role of the Foreign Sector and Aid, Harvard University Press, Studies in the Modernization of the Republic of Korea: l948-l975, Cambridge, MA.

Krueger, Anne O., l997. "Lessons for Policy Reform in Light of the Mexican Experience", Pp.44-61 in Jitendralal Borkakoti and Chris Milner, editors, International Trade and Labour Markets, MacMillan Press , Houndmills, Basingstroke and London.

Little, I. M. D., Richard N. Cooper, W. Max Corden and Sarath Rajapatirana, l993. Boom, Crisis and Adjustment: The Macroecononic Experience of Developing Countries, Oxford University Press, New York.

Mussa, Michael and Miguel Savastano, 2000. “The IMF Approach to Economic Stabilization”, Pp. 79-l22. In National Bureau of Economic Research Macroeconomics Annual l999, MIT Press, Cambridge, MA

O.E.C.D., l994.OECD Economic Surveys. Korea l994. OECD. Paris.

Sachs, Jeffrey, “The Wrong Medicine for Asia”, New York Times, November 3.

Williamson, John, editor, l983. IMF Conditionality. Institute for International Economics, Washington, D. C.

Fig. 1: GDP per capita, Investments, Savings, Capital Inflows

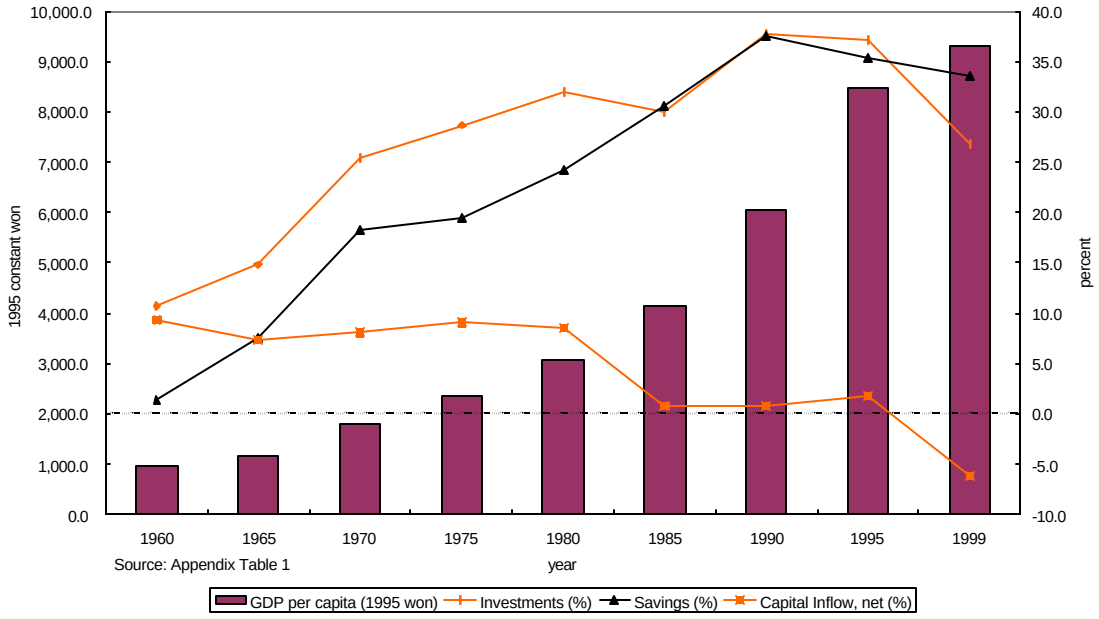
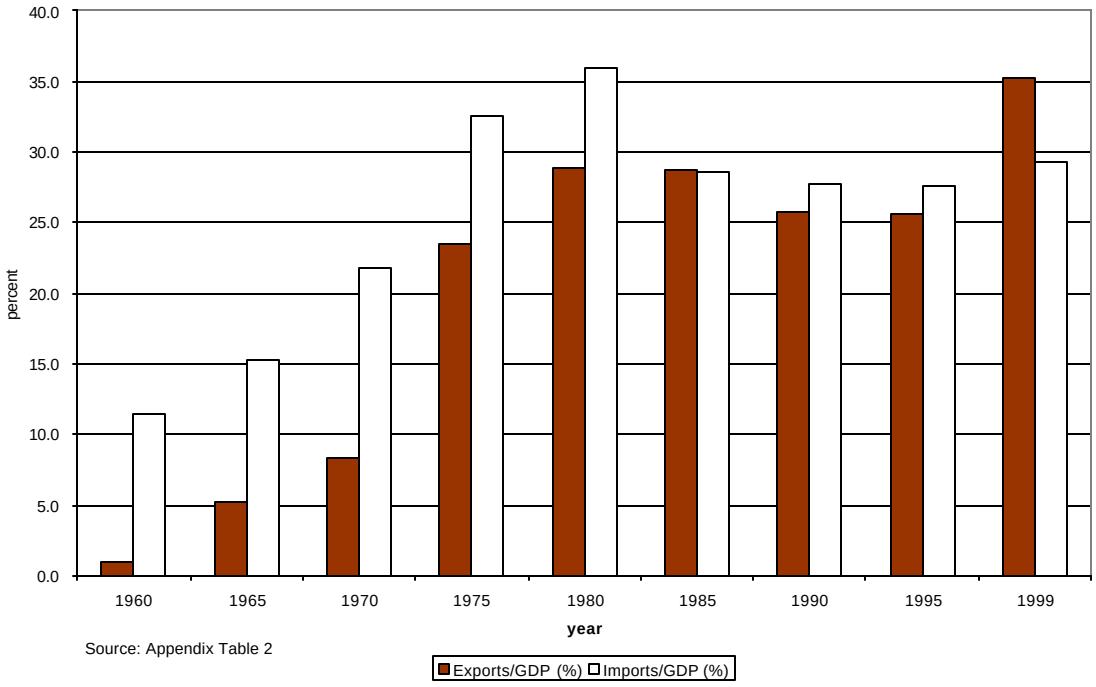
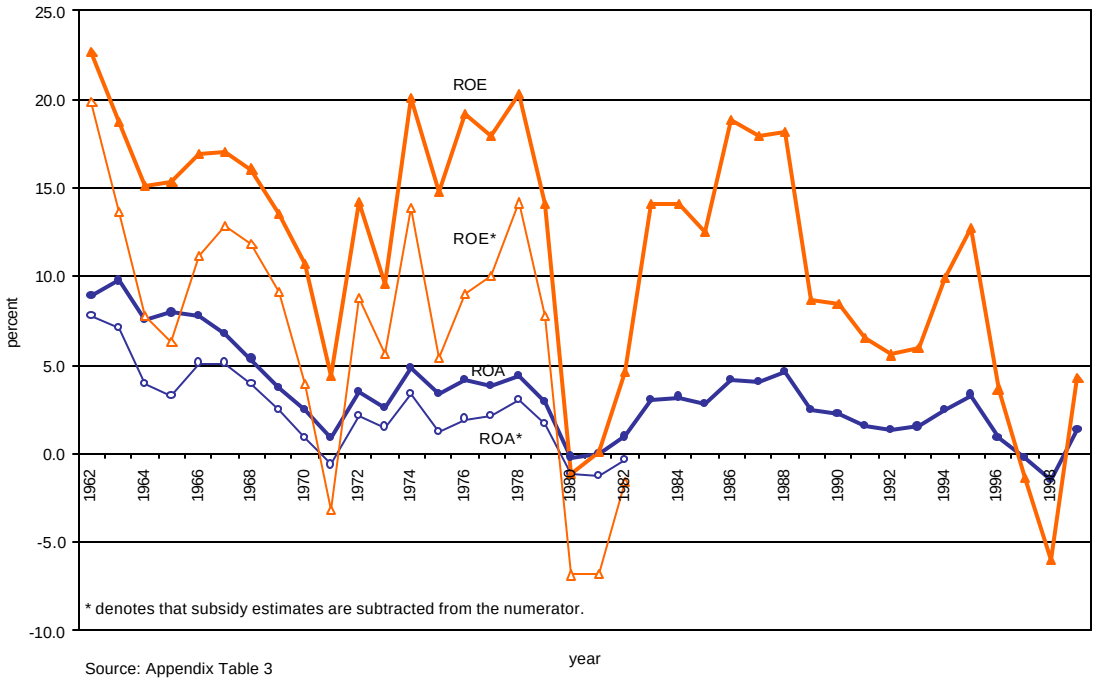


Fig. 2: Dependency on Trade



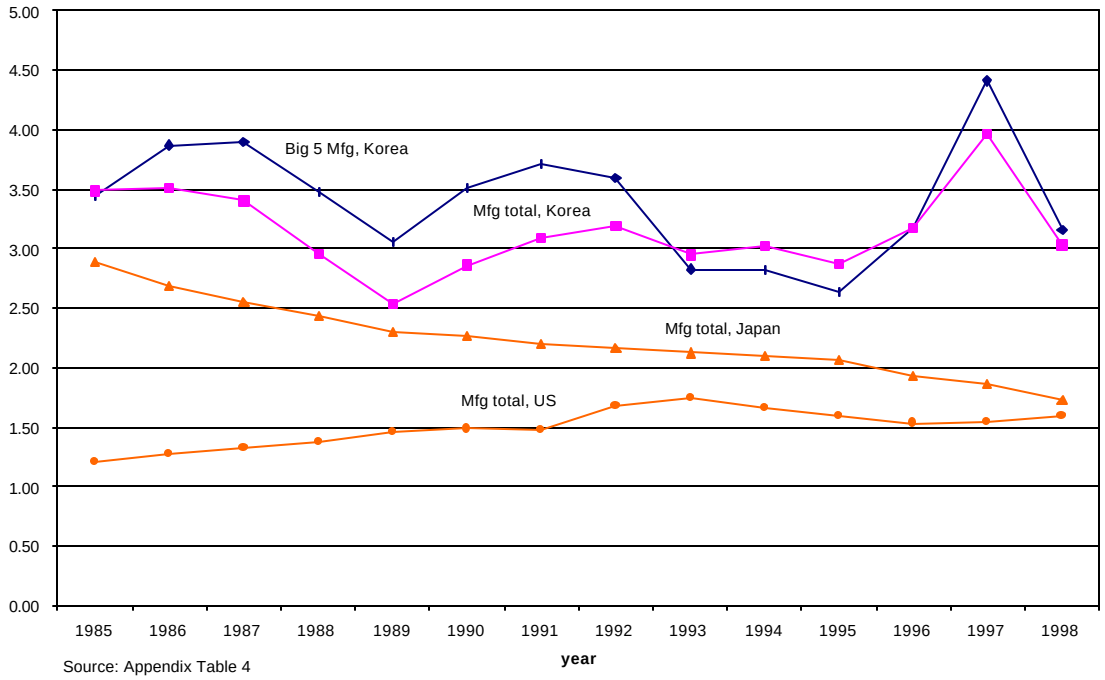
Source: Appendix Table 2

Fig.3: Rates of Return, Manufacturing Sector Total



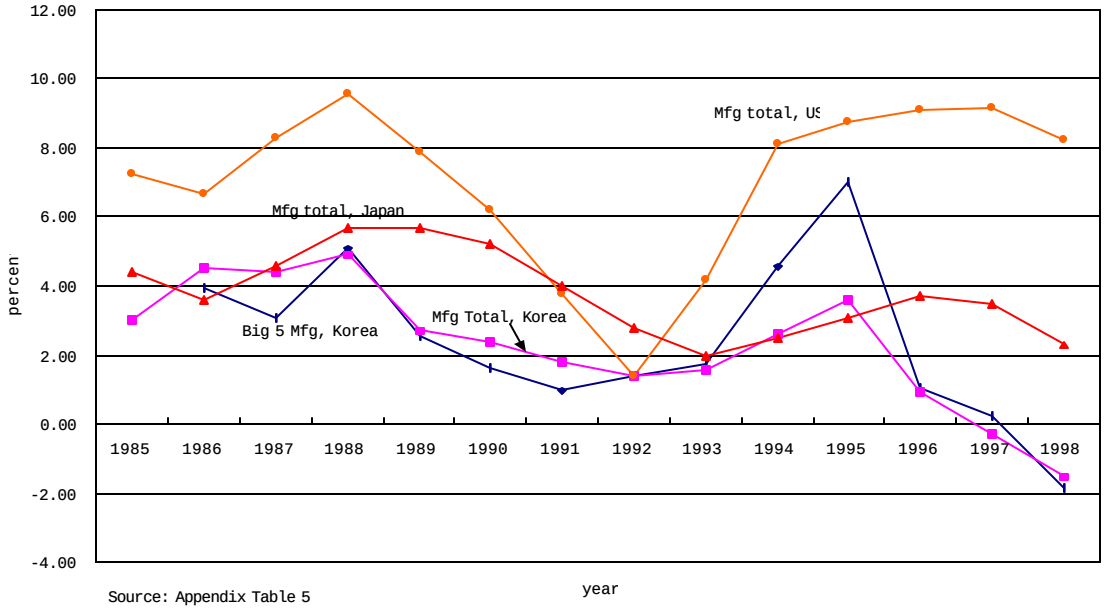
Source: Appendix Table 3

Fig. 4: Debt-Equity Ratios, International Comparison



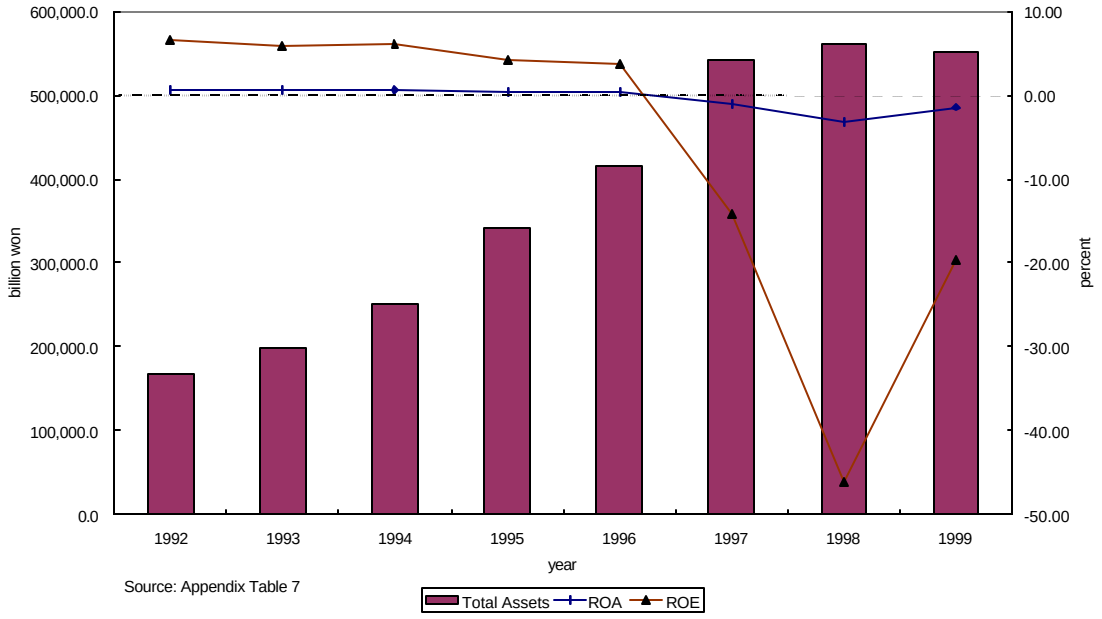
Source: Appendix Table 4

Fig. 5: Return on Assets, International Comparison



Source: Appendix Table 5

Fig. 6: Assets and Rates of Returns, Commercial Banks Total



Source: Appendix Table 7

Table 1: Interest Rates on Loans and Discounts, Deposit Money Banks

	Discounts on commercial bills	Loan for trade	Loans for machine industry promotion	Loans for Equipment of export industry	Loans with NIF	"Lending rate"
1961	13.9	13.9	n.a.	n.a.	n.a.	n.a.
1962	13.9	12.7	n.a.	n.a.	n.a.	n.a.
1963	13.9	9.1	n.a.	n.a.	n.a.	n.a.
1964	14.0	6.8	n.a.	n.a.	n.a.	n.a.
1965	16.5	6.5	n.a.	n.a.	n.a.	n.a.
						n.a.
1966	24.0	6.5	n.a.	n.a.	n.a.	n.a.
1967	24.0	6.3	n.a.	n.a.	n.a.	n.a.
1968	24.3	6.0	12.0	n.a.	n.a.	n.a.
1969	25.2	6.0	12.0	n.a.	n.a.	n.a.
1970	24.3	6.0	12.0	n.a.	n.a.	n.a.
						n.a.
1971	22.9	6.0	12.0	n.a.	n.a.	n.a.
1972	17.7	6.0	10.1	n.a.	n.a.	n.a.
1973	15.5	6.6	10.0	12.0	n.a.	n.a.
1974	15.5	8.9	11.1	12.0	9.2	n.a.
1975	15.3	7.6	12.0	12.0	12.0	n.a.
						n.a.
1976	16.3	7.4	12.4	12.8	12.8	n.a.
1977	16.7	8.0	13.0	14.0	14.0	n.a.
1978	17.8	8.5	14.1	15.1	15.1	n.a.
1979	18.8	9.0	15.0	16.0	14.7	n.a.
1980	24.1	14.8	20.2	21.2	18.2	18.0
1981	19.4	15.0	17.9	18.8	16.4	17.4
1982	12.3	10.8	12.1	n.a.	12.2	11.8
1983	10.0	10.0	10.0	n.a.	10.0	10.0
1984	10.3	10.0	10.0	n.a.	10.7	10.0
1985	10.8	10.0	n.a.	n.a.	10.8	10.0
1986	10.8	10.0	n.a.	n.a.	10.5	10.0
1987	10.8	10.0	n.a.	n.a.	n.a.	10.0
1988	n.a.	n.a.	n.a.	n.a.	n.a.	10.1
1989	n.a.	n.a.	n.a.	n.a.	n.a.	11.3
1990	n.a.	n.a.	n.a.	n.a.	n.a.	10.0

Table 1: Interest Rates on Loans and Discounts, Deposit Money Banks (cont'd)

	Discounts on commercial bills	Loan for trade	Loans for machine industry promotion	Loans for Equipment of export industry	Loans with NIF	"Lending rate"
1991	n.a.	n.a.	n.a.	n.a.	n.a.	10.0
1992	n.a.	n.a.	n.a.	n.a.	n.a.	10.0
1993	n.a.	n.a.	n.a.	n.a.	n.a.	8.6
1994	n.a.	n.a.	n.a.	n.a.	n.a.	8.5
1995	n.a.	n.a.	n.a.	n.a.	n.a.	9.0
1996	n.a.	n.a.	n.a.	n.a.	n.a.	8.8
1997	n.a.	n.a.	n.a.	n.a.	n.a.	11.9
1998	n.a.	n.a.	n.a.	n.a.	n.a.	15.3

Source: The first five columns are from Bank of Korea, *Monthly Statistical Bulletin*, various issues.
"Lending rate" is obtained from *International Financial Statistics*, various issues.

Note : 1. Bank of Korea stopped reporting DMB interest rates in this format in 1988.
2. "Lending rate" is the minimum rate charged to general enterprises by DMBs on loans of general funds for up to one year. From 1977 it is a weighted average, weighted by loans by nationwide commercial banks.
3. National Investment Fund (NIF) was created in 1973 to help finance policy-favored investment projects.

Table 2: Reference Interest Rates

(percent per annum)

	Curb market interest rate	Inflation, CPI	GDP growth rate	Reference interest rate
	(1)	(2)	(3)	(4)=(2)+(3)
1961	n.a.	6.5	3.5	10.1
1962	n.a.	7.7	3.3	11.0
1963	n.a.	11.5	5.7	17.2
1964	61.8	18.1	7.3	25.3
1965	58.9	20.4	8.2	28.6
1966	58.7	17.6	9.4	26.9
1967	56.7	11.9	8.4	20.3
1968	56.0	11.0	10.2	21.2
1969	51.4	11.3	10.6	21.9
1970	50.2	13.0	10.9	23.9
1971	46.4	13.9	10.0	23.9
1972	39.0	13.7	7.0	20.7
1973	33.2	9.4	8.6	18.0
1974	40.6	13.0	8.2	21.2
1975	47.6	17.6	8.8	26.3
1976	40.5	21.6	8.4	30.0
1977	38.1	16.9	9.2	26.1
1978	41.7	13.3	10.1	23.3
1979	42.4	14.3	8.7	23.0
1980	44.9	20.5	4.7	25.1
1981	35.3	22.8	3.8	26.6
1982	33.1	19.1	3.9	22.9
1983	25.8	10.6	8.1	18.8
1984	24.8	4.3	8.7	13.0
1985	24.0	2.7	8.5	11.2
1986	23.1	2.5	8.6	11.1
1987	23.0	2.8	9.5	12.2
1988	22.7	4.3	10.8	15.1
1989	19.1	5.3	9.2	14.4
1990	18.7	7.1	8.5	15.6

Table 2: Reference Interest Rates (continued)

(percent per annum)

	Curb market interest rate	Inflation, CPI	GDP growth rate	Reference interest rate
	(1)	(2)	(3)	(4)=(2)+(3)
1991	21.4	7.9	8.1	16.0
1992	20.2	8.0	7.9	15.9
1993	16.2	6.8	6.7	13.5
1994	16.0	5.8	6.4	12.2
1995	15.3	5.2	7.6	12.8
1996	13.7	5.2	8.0	13.2
1997	14.6	4.6	6.9	11.5
1998	n.a.	5.6	1.7	7.3

Source: Bank of Korea, *Economic Statistics Yearbook*, various issues.
Note: Inflation and GDP growth rates shown are three-year moving averages.

Table 3: Deposit Money Bank Preferential Loans

(billion won)

	(1) Loans for trade	(2) Loans for machine industry promotion	(3) Loans for equipment of export industry	(4) Loans with NIF	(5) Sum of preferential loans, (1)-(4)	(6) Total loans	(7) Preferential loans, as a percentage of total (%)
1963	2.7	n.a	n.a	n.a	2.7	49.0	5.5
1964	2.5	n.a	n.a	n.a	2.5	53.0	4.6
1965	4.6	n.a	n.a	n.a	4.6	72.1	6.4
1966	4.9	n.a	n.a	n.a	4.9	102.7	4.7
1967	16.7	n.a	n.a	n.a	16.7	178.0	9.4
1968	24.5	n.a	n.a	n.a	24.5	331.2	7.4
1969	35.1	10.0	n.a	n.a	45.1	563.0	8.0
1970	55.9	15.9	n.a	n.a	71.7	722.4	9.9
1971	80.1	15.8	n.a	n.a	96.0	919.5	10.4
1972	108.4	20.2	n.a	n.a	128.6	1198.0	10.7
1973	224.1	26.1	35.0	n.a	285.3	1587.5	18.0
1974	359.5	25.0	56.0	20.4	460.9	2427.8	19.0
1975	338.9	23.2	61.2	53.4	476.7	2905.5	16.4
1976	461.8	31.5	76.9	121.0	691.1	3724.9	18.6
1977	567.4	28.2	70.9	196.7	863.2	4709.0	18.3
1978	883.2	26.1	57.0	287.7	1254.0	6609.0	19.0
1979	1227.2	15.1	42.7	362.7	1647.7	8977.8	18.4
1980	1720.8	10.2	26.2	405.3	2162.4	12204.4	17.7
1981	2197.2	6.1	179.9	487.2	2870.4	16481.7	17.4
1982	2278.4	n.a	192.1	626.7	3097.2	20225.8	15.3
1983	2620.0	n.a	185.7	831.1	3636.8	24150.3	15.1
1984	2765.4	n.a	176.3	909.2	3850.9	27978.9	13.8
1985	3129.9	n.a	595.2	965.6	4690.7	33810.7	13.9
1986	3444.5	n.a	1866.9	1055.0	6366.4	39098.6	16.3
1987	2420.4	n.a	2416.5	1067.1	5904.0	43095.8	13.7
1988	1201.6	n.a	2725.8	1076.1	5003.5	48805.4	10.3
1989	1382.2	n.a	2905.0	1053.3	5340.5	62547.1	8.5
1990	1947.3	n.a	3015.0	1023.8	5986.1	74028.6	8.1
1991	2254.3	n.a	3201.1	983.9	6439.3	89415.6	7.2
1992	2542.2	n.a	3043.9	803.3	6389.4	102797.0	6.2
1993	2473.4	n.a	2838.0	609.2	5920.6	115137.4	5.1

1994	2711.3	n.a	2492.2	445.2	5648.7	135850.3	4.2

Table 3: DMB Preferential Loans (cont'd)

	(1) Loans for trade	(2) Loans for machine industry promotion	(3) Loans for Equipment of export Industry	(4) Loans with NIF	(5) Sum of preferential loans, (1)-(4)	(6) Total loans	(7) Preferential loans, as a percentage of total (%)
1995	2846.9	n.a	1841.4	316.7	5005.0	152477.7	3.3
1996	2679.3	n.a	1214.5	197.1	4090.9	177184.2	2.3
1997	2698.2	n.a	711.2	119.5	3528.9	200401.0	1.8
1998	3395.8	n.a	355.7	73.6	3825.1	200289.1	1.9

Source: Bank of Korea, *Economic Statistics Yearbook*, various issues.

Table 4: Estimates of Implicit Subsidy through Deposit Money Bank and Korea Development Bank Loans

(billion won)

	Through DMB Loans	Through KDB Loans	Sum of subsidy estimates	Ordinary income, mfg. total
1963	0.2	1.1	1.2	4.5
1964	0.5	2.2	2.7	5.6
1965	0.8	3.1	3.9	6.6
1966	1.0	2.9	3.9	11.4
1967	1.5	1.8	3.3	13.4
1968	3.1	2.3	5.5	20.6
1969	5.2	2.7	7.9	24.3
1970	9.7	4.8	14.5	22.9
1971	14.1	6.2	20.3	11.8
1972	15.8	5.7	21.5	56.5
1973	21.9	4.2	26.0	62.3
1974	44.1	10.1	54.2	176.1
1975	82.6	25.0	107.6	169.7
1976	122.1	43.6	165.7	313.6
1977	125.6	47.3	172.9	390.0
1978	135.0	52.2	187.3	615.1
1979	179.4	77.3	256.7	573.9
1980	185.0	86.8	271.8	-55.7
1981	286.4	167.7	454.1	5.6
1982	331.5	215.1	546.6	403.6

Source: The last column is from Bank of Korea, *Financial Statements Analysis*, various issues.
Note: Estimates of subsidy are made in Appendix Tables 10 and 11.

Table 5: Asset Growth Rates

(percentage change per annum)

	Big 30 total	Big 5 total	Big 5 mfg	Manufacturing total
1986	51.84	45.96	60.90	14.1
1987	20.03	26.44	29.15	23.4
1988	20.03	26.44	29.15	16.4
1989	31.19	27.04	31.59	22.7
1990	29.07	33.03	33.81	36.2
1991	24.17	22.09	25.20	23.0
1992	11.91	10.94	6.26	10.5
1993	12.03	10.84	11.03	15.0
1994	23.45	25.92	28.73	21.6
1995	25.57	30.20	27.81	15.5
1996	19.48	21.29	20.72	13.6
1997	34.97	40.63	42.23	24.9
1998	3.91	13.12	11.35	1.9
1999	n.a.	n.a.	n.a.	10.6
1997/1985 (ratio)	14.4	18.7	19.7	8.5

Source: The same as in Appendix Table 5.

Note: The growth rates for Big 5 and Big 30 shown for 1987 and 1988 are Averages for the two years. Big 5 held 16 percent of all assets in Manufacturing sector in 1985 and 40 percent in 1997.

Table 6: Changes in Income, Commercial Banks Total

(billion won)

	1992	1993	1994	1995	1996	1997	1998	1999
Gross income	5,336.0	5,995.8	8,332.7	9,339.7	10,418.0	10,505.9	2,909.4	8,367.1
Interest income, net	3,088.1	3,127.0	3,426.7	4,920.2	6,059.5	7,817.2	6,777.2	9,046.8
interests received	10,471.3	10,109.9	12,308.6	18,321.7	21,755.8	31,892.0	37,943.0	35,017.4
interests paid(less)	7,383.2	6,983.0	8,882.0	13,401.6	15,696.3	24,074.8	31,165.9	25,970.7
non-interest income	2,247.9	2,868.9	4,906.1	4,419.5	4,358.6	2,688.7	-3,867.8	-679.6
fees received	1,250.5	1,551.8	2,480.8	2,249.4	2,281.0	10,299.2	13,266.4	8,210.3
fees paid(less)	184.1	175.9	237.9	372.8	650.1	8,039.4	11,849.0	5,292.1
other non-interest income	1,139.7	1,453.1	2,407.9	2,353.9	2,569.1	2,696.9	614.7	444.1
non-operating incomes	41.8	39.9	255.3	189.1	158.6	-2,268.1	-5,899.9	-4,041.9
Operating expenses(less)	3,176.5	3,649.8	4,362.6	6,033.0	6,982.0	8,093.9	7,587.3	6,445.6
of which, personnel expenses	2,221.3	2,595.4	3,187.4	4,228.8	4,964.4	5,609.0	5,596.0	2,885.9
Ordinary income	2,159.5	2,346.0	3,970.1	3,306.7	3,436.0	2,412.0	-4,677.8	1,921.5
Increase in loss provision(less)	942.5	1,023.4	2,371.8	2,319.7	2,342.0	6,192.7	7,780.4	7,487.3
Loans	787.6	995.5	2,127.3	1,758.0	1,547.7	3,511.3	8,066.7	7,487.3
Security valuation	95.7	-33.1	183.6	543.5	895.0	2,759.4	-125.8	0.0
Others	59.2	61.0	60.9	18.2	-100.7	-78.0	-160.5	0.0
Income before income tax	1,217.0	1,322.6	1,598.3	987.0	1,094.1	-3,780.7	-12,458.2	-5,565.8
Income tax(less)	285.5	433.6	550.1	119.2	247.2	139.2	52.4	430.2
Net income	931.5	889.0	1,048.2	867.8	846.9	-3,919.9	-12,510.6	-5,996.0

Source: Financial Supervisory Commission, On-line service

Table 7: Factors behind the Sudden Changes in Income, Individual Banks

(billion won)

	Net income	Provision for NPLs	Provision for valuation loss	Non-operating income	NPLs, reported
Choheung					
1993	975	1,520	-72	68	n.a.
1994	1,363	2,967	44	125	14,465
1995	1,066	1,867	860	181	15,476
1996	1,102	1,484	873	214	14,137
1997	-2,896	3,891	3,094	-1,136	26,232
1998	-19,708	5,840	n.a.	-10,071	15,155
Korea Commercial Bank					
1993	87	1,376	-32	50	n.a.
1994	545	3,622	423	2,205	20,260
1995	916	1,860	776	999	19,193
1996	1,055	893	686	442	10,340
1997	-1,639	1,775	1,982	-1,206	14,512
1998	-16,438	3,721	n.a.	-9,918	9,686
Han Il					
1993	1,195	660	22	56	n.a.
1994	1,292	1,490	342	117	12,131
1995	805	828	875	120	11,569
1996	590	688	974	142	6,756
1997	-2,809	2,989	3,634	-313	13,244
1998	-17,166	5,696	n.a.	-3,795	17,495
Korea Exchange Bank					
1993	834	1,224	-107	16	n.a.
1994	1,003	2,996	-109	90	17,886
1995	1,053	1,700	501	125	17,433
1996	1,041	1,283	757	58	12,943
1997	-684	2,859	2,072	-1,543	25,176
1998	-8,435	2,056	n.a.	-8,927	15,084
Korea First					
1993	1,541	913	-36	7	n.a.
1994	1,313	3,168	354	50	14,186
1995	174	2,667	112	188	15,913
1996	62	2,732	871	393	18,697

	1997	-16,151	4,514	3,518	-9,064	30,559
	1998	-26,149	2,581	n.a.	-6,769	38,323
Seoul						
	1993	103	1,712	-19	107	n.a.
	1994	531	2,694	33	103	16,958
	1995	50	2,216	341	204	16,639
	1996	-1,668	2,735	977	208	20,353
	1997	-9,166	1,731	3,047	-3,996	24,040
	1998	-22,424	3,530	n.a.	-2,266	29,872

Source: Financial Supervisory Commission, On-line service

Table 8: Foreign Currency Denominated Assets and Liabilities, Commercial Banks

(billion won)

	Assets			Liabilities		
	total	foreign-currency denominated	share (%)	total	Foreign-currency denominated	share (%)
1991	161,516.6	18,511.7	11.5	147,736.0	19,169.8	13.0
1992	180,615.6	20,809.4	11.5	165,724.4	20,963.7	12.6
1993	194,988.6	23,787.2	12.2	178,766.0	24,672.2	13.8
1994	228,961.5	30,165.5	13.2	210,044.8	31,313.1	14.9
1995	288,687.8	39,621.3	13.7	267,308.2	40,466.9	15.1
1996	341,558.7	51,861.5	15.2	318,321.7	52,802.2	16.6
1997 J	354,654.9	55,596.3	15.7	325,827.7	55,608.7	17.1
A	360,179.4	56,504.4	15.7	331,075.6	57,767.2	17.4
S	402,529.2	58,197.9	14.5	370,370.1	59,758.2	16.1
O	414,296.5	61,738.5	14.9	381,377.5	64,719.6	17.0
N	435,322.1	72,772.1	16.7	402,357.5	74,440.5	18.5
D	483,498.6	96,448.7	19.9	461,208.8	102,828.2	22.3
1998 J	498,298.8	101,167.1	20.3	467,189.8	113,532.7	24.3
F	504,682.4	110,024.8	21.8	472,441.0	118,551.5	25.1
M	479,636.4	96,407.9	20.1	445,908.6	99,483.8	22.3
A	469,613.1	93,215.7	19.8	435,165.8	96,635.3	22.2
M	471,013.8	97,461.6	20.7	435,140.6	101,132.7	23.2
J	467,583.0	92,560.0	19.8	433,414.5	96,257.4	22.2
J	459,565.3	81,936.0	17.8	425,298.6	85,374.6	20.1
1998 D	469,280.5	72,676.7	15.5	448,765.9	70,633.9	15.7
1999	519,748.6	58,092.9	11.2	493,261.7	55,028.4	11.2

Source: Bank of Korea, *Monthly Statistical Bulletin*, various issues

Appendix: Chronology of Selected Events

1945	Liberation from Japanese colonial rule
1948	Establishment of Republic of Korea
1950-53	Korean war
1957-58	IMF Stabilization Program
1960-65	Announcement of first major step in trade policy reform and continuous expansion of export incentives
1961	Nationalization of commercial banks
1964	Major devaluation of won, the domestic currency
1965	Unification of exchange rates; Move to positive real interest rate for commercial banks
1967	Korea joins the GATT; Import regime is liberalized by switching from positive list to negative list system.
1972	First domestic debt crisis; Presidential emergency decree places a three-year moratorium on the payment of corporate debts to curb-market lenders.
1973	Government launches a Heavy and Chemical Industry (HCI) drive.
1979	Government announces "Comprehensive Stabilization Program" that ends the HCI drive.
1980	A major devaluation of won and further trade liberalization including multi-year tariff reduction plan
1980's	"Rationalization" of industries in financial troubles
1983	Privatization of commercial banks
1988	Interest rate deregulation begins.
1989	Piecemeal liberalization of international financial transactions begins, including a more market-determined exchange rate.
1993	Government announces "New Economy 100 Days Plan"; Bank of Korea lowers its rediscount rates from seven percent to five.
1996	Korea joins OECD; Commitments to financial liberalization are made.
1997	Korea and IMF agree on a rescue package (Dec.). Free floating exchange rate system (Dec.)
1998	Sweeping reform and liberalization of financial sector

Appendix Table 1: Korea's GDP, GDP Per Capita, Investment, Capital Inflows, and Savings 1960-2000

	Real GDP (billions of 1995 won)	GDP per capita (1995 won)	Investments (%)	Savings (%)	Capital Inflow, net (%)
1960	24,524.5	981.4	10.8	1.4	9.3
1965	33,207.5	1,158.3	14.8	7.5	7.4
1970	56,209.0	1,788.1	25.4	18.2	8.1
1975	82,257.5	2,372.0	28.7	19.4	9.0
1980	114,977.7	3,073.7	31.9	24.2	8.5
1985	167,501.9	4,142.8	30.0	30.6	0.8
1990	263,430.4	6,068.3	37.7	37.6	0.8
1995	377,349.8	8,459.1	37.2	35.4	1.8
1999	436,798.5	9,321.4	26.8	33.5	-6.1

Source: Bank of Korea, *Economic Statistics Yearbook*, various issues and on-line service.

Appendix Table 2: Foreign Trade in the Korean Economy 1960-2000

	Exports ($million)	Imports ($million)	Exports/GDP (%)	Imports/GDP (%)
1960	116.9	379.2	3.4	12.7
1965	289.8	488.4	8.6	16.2
1970	1,379.0	2,181.7	13.8	23.9
1975	5,883.6	7,997.2	27.2	35.7
1980	19,815.3	25,151.5	32.7	40.6
1985	30,455.4	30,017.0	32.9	32.1
1990	73,295.4	76,360.5	29.1	30.3
1995	147,459.5	154,882.5	30.2	31.7
1999	171,692.4	143,972.5	42.1	35.3

Source: Bank of Korea, *Economic Statistics Yearbook*, various issues.
Note: Exports and imports are those of goods and services on the balance of payments basis.

1960	32.8	343.5	1.0	11.5
1965	175.1	463.4	5.2	15.3
1970	835.2	1,984.0	8.3	21.8
1975	5,081.0	7,274.4	23.5	32.5
1980	17,504.9	22,291.7	28.9	36.0
1985	26,632.6	26,652.8	28.8	28.5
1990	65,015.7	69,843.7	25.8	27.7
1995	125,058.0	135,118.9	25.6	27.6
1999	143,685.5	119,752.3	35.2	29.3

Source: Bank of Korea, *Economic Statistics Yearbook*, various issues.
Note: Exports and imports are those of goods only on the custom clearance basis.

Appendix Table 3: Estimates of Upper Bounds of Subsidy through DMB Loans

(billion won)

	Estimate I	Estimate II	Ordinary income, mfg. total
1963	1.5	n.a.	4.5
1964	5.5	n.a.	5.6
1965	7.1	n.a.	6.6
1966	2.4	n.a.	11.4
1967	-4.8	n.a.	13.4
1968	-7.4	n.a.	20.6
1969	-13.5	n.a.	24.3
1970	-2.2	n.a.	22.9
1971	7.2	n.a.	11.8
1972	28.7	n.a.	56.5
1973	30.0	n.a.	62.3
1974	93.8	n.a.	176.1
1975	243.0	n.a.	169.7
1976	373.5	n.a.	313.6
1977	326.1	n.a.	390.0
1978	253.6	n.a.	615.1
1979	267.0	n.a.	573.9
1980	91.6	754.8	-55.7
1981	847.4	1,316.5	5.6
1982	1,628.3	2,044.8	403.6
1983	n.a.	1,946.1	1,454.3
1984	n.a.	790.2	1,619.1
1985	n.a.	372.8	1,666.5
1986	n.a.	399.4	2,839.4
1987	n.a.	921.1	3,413.5
1988	n.a.	2,299.1	4,433.1
1989	n.a.	1,749.7	2,950.7
1990	n.a.	3,851.9	3,575.7
1991	n.a.	4,873.3	3,199.2
1992	n.a.	5,678.1	2,948.4
1993	n.a.	5,348.9	3,855.8

Appendix Table 3: Estimates of Upper Bounds of Subsidy through DMB Loans (cont'd)

1994	n.a.	4,586.5	7,623.0
1995	n.a.	5,410.5	11,842.4
1996	n.a.	7,213.1	3,551.7
1997	n.a.	-721.0	-1,408.7
1998	n.a.	-16,004.9	-7,754.1

Note 1: This estimation recognizes that DMBs' general purpose loans other than the loans enjoying preferential rates also had an element of subsidy, since the loan rates were lower than a market-clearing rate might have been. However, Estimate II, since it has to make use of the *IFS*'s "lending rate", is an estimate of the upper bounds of subsidy rather than that of actual subsidy.

Note 1: Estimate I is made by multiplying the total loans less sum of preferential loans (Table 3) by the difference between the reference interest rate (Table 2) and the loan rate applied to "discounts on commercial bills" (Table 1).

Note 2: Estimate II is made by multiplying the total loans (Table 3) by the difference Between the reference interest rates and the lending rates (Table 1)

Appendix Table 4: Rates of Return, Manufacturing Sector

(percent per annum)

	ROA	ROA*	ROE	ROE*
1962	8.9	7.8	22.6	19.8
1963	9.7	7.1	18.8	13.7
1964	7.5	3.9	15.1	7.8
1965	7.9	3.3	15.3	6.3
1966	7.8	5.1	16.9	11.1
1967	6.8	5.1	17.0	12.8
1968	5.3	3.9	16.1	11.8
1969	3.7	2.5	13.5	9.1
1970	2.5	0.9	10.7	3.9
1971	0.9	-0.6	4.4	-3.2
1972	3.4	2.1	14.2	8.8
1973	2.6	1.5	9.6	5.6
1974	4.8	3.3	20.0	13.9
1975	3.4	1.2	14.7	5.4
1976	4.1	1.9	19.1	9.0
1977	3.8	2.1	18.0	10.0
1978	4.4	3.0	20.3	14.2
1979	3.0	1.6	14.1	7.8
1980	-0.2	-1.2	-1.2	-6.8
1981	0.0	-1.2	0.1	-6.8
1982	0.9	-0.3	4.6	-1.6
1983	3.1	n.a.	14.1	n.a.
1984	3.2	n.a.	14.1	n.a.
1985	2.8	n.a.	12.5	n.a.
1986	4.2	n.a.	18.8	n.a.
1987	4.1	n.a.	17.9	n.a.
1988	4.6	n.a.	18.2	n.a.
1989	2.5	n.a.	8.7	n.a.
1990	2.2	n.a.	8.5	n.a.
1991	1.6	n.a.	6.5	n.a.
1992	1.3	n.a.	5.6	n.a.
1993	1.5	n.a.	6.0	n.a.
1994	2.5	n.a.	9.9	n.a.
1995	3.3	n.a.	12.8	n.a.

Appendix Table 4: Rates of Return, Manufacturing Sector (continued)

(percent per annum)

	ROA	ROA*	ROE	ROE*
1996	0.9	n.a.	3.6	n.a.
1997	-0.3	n.a.	-1.4	n.a.
1998	-1.5	n.a.	-6.0	n.a.
1999	1.4	n.a.	4.3	n.a.

Notes: ROA and ROE are estimates based on Bank of Korea, *Financial Statements Analysis*, various issues. * indicates that numerator is ordinary income less subsidy estimates reported in Table 6.

Appendix Table 5: Debt-Equity Ratios

	Korea Big 30 all firms	Korea Big 5 all firms	Korea Big 5 mfg. Firms	Korea Mfg Total	US Mfg Total	Japan Mfg Total	Taiwan Mfg Total
1985	4.62	4.40	3.44	3.49	1.21	2.89	1.37
1986	4.93	4.42	3.87	3.51	1.27	2.69	1.26
1987	4.62	4.45	3.90	3.40	1.33	2.55	1.11
1988	3.32	3.64	3.48	2.96	1.38	2.44	1.08
1989	3.31	3.14	3.06	2.54	1.47	2.30	0.91
1990	3.70	3.61	3.51	2.86	1.49	2.27	0.83
1991	3.89	3.77	3.71	3.09	1.47	2.21	0.98
1992	4.00	3.75	3.60	3.20	1.68	2.16	0.93
1993	3.51	3.17	2.83	2.95	1.75	2.13	0.88
1994	3.59	3.18	2.82	3.02	1.67	2.10	n.a.
1995	3.53	3.07	2.64	2.87	1.60	2.07	n.a.
1996	3.90	3.54	3.18	3.17	1.54	1.93	n.a.
1997	5.24	4.67	4.41	3.96	1.54	1.87	n.a.
1998	3.62	3.31	3.16	3.03	1.59	1.73	n.a.
1999	n.a.	n.a.	n.a.	2.15	n.a.	n.a.	n.a.

Source: The first three columns are estimated from the firm level data by National Information and Credit Evaluation. The rest are from Bank of Korea, *Financial Statement Analysis for 1999* and *Explanation of Financial Statement Analysis*(1985).

Note: The estimates for 1987 are not directly comparable with those for other years.

Appendix Table 6: Return on Assets

(percent per annum)

	Korea Big 30 all firms	Korea Big 5 all firms	Korea Big 5 mfg. Firms	Korea Mfg Total	US Mfg Total	Japan Mfg Total	Taiwan Mfg Total
1985	n.a.	n.a.	n.a.	3.00	7.23	4.40	3.12
1986	1.95	3.03	3.93	4.50	6.67	3.60	6.84
1987	2.11	2.54	3.09	4.40	8.29	4.60	6.89
1988	3.96	4.23	5.07	4.90	9.57	5.70	5.72
1989	2.30	2.72	2.55	2.70	7.87	5.70	3.84
1990	1.57	1.71	1.61	2.40	6.22	5.20	4.27
1991	1.22	1.20	0.97	1.80	3.79	4.00	3.99
1992	1.09	1.49	1.38	1.40	1.40	2.80	2.89
1993	1.24	1.78	1.75	1.60	4.19	2.00	2.50
1994	2.50	3.82	4.55	2.60	8.12	2.50	n.a.
1995	3.35	5.41	7.03	3.59	8.72	3.10	n.a.
1996	0.61	1.18	1.07	0.93	9.10	3.70	n.a.
1997	-0.87	0.37	0.27	-0.30	9.16	3.50	n.a.
1998	-1.82	-1.33	-1.82	-1.52	8.20	2.30	n.a.
1999	n.a.	n.a.	n.a.	1.38	n.a.	n.a.	n.a.

Source: The same as in Appendix Table 5.

Note: The estimates in the first three columns for 1987 and 1988 are not directly comparable with those for other years.

Appendix Table 7: Return on Equity

(percent per annum)

	Korea Big 30 all firms	Korea Big 5 all firms	Korea Big 5 mfg. Firms	Korea Mfg Total	US Mfg Total	Japan Mfg Total	Taiwan Mfg Total
1985	n.a.	n.a.	n.a.	13.20	15.98	17.70	7.57
1986	11.33	16.37	18.42	20.10	15.16	13.30	15.89
1987	12.20	13.80	15.08	19.90	19.33	16.60	15.00
1988	18.76	20.76	23.38	20.60	22.80	20.10	12.14
1989	9.94	11.84	10.77	10.10	19.42	19.10	7.51
1990	7.11	7.51	6.93	9.10	15.47	16.90	7.94
1991	5.86	5.62	4.47	7.00	9.37	13.10	7.87
1992	5.40	7.09	6.41	5.80	3.75	9.00	5.54
1993	5.87	7.86	7.30	6.40	11.50	6.50	4.76
1994	11.38	15.95	17.40	10.50	21.64	7.70	n.a.
1995	15.26	22.28	26.12	14.00	22.65	9.60	n.a.
1996	2.89	5.08	4.18	3.74	23.07	10.80	n.a.
1997	-4.83	1.92	1.28	-1.38	23.26	10.20	n.a.
1998	-9.61	-6.47	-8.51	-6.72	21.23	6.40	n.a.
1999	n.a.	n.a.	n.a.	4.96	n.a.	n.a.	n.a.

Source: The same as in Appendix Table 5.

Note: The estimates in the first three columns for 1987 and 1988 are not directly comparable with those for other years.

Appendix Table 8: Rates of Return, Commercial Banks Total

(billion won, %)

	Total Assets	Net Income	ROA	ROE
1992	167,425.1	931.5	0.71	6.56
1993	198,481.3	889.0	0.62	5.90
1994	250,081.2	1,048.2	0.62	6.09
1995	340,543.0	867.8	0.38	4.19
1996	415,437.8	846.9	0.31	3.80
1997	542,552.8	-3,919.9	-1.06	-14.19
1998	560,059.7	-12,510.6	-3.15	-46.15
1999	550,345.3	-5,996.0	-1.42	-19.62

Source: Financial Supervisory Commission, on-line-service

Appendix Table 9: Foreign Currency Denominated Assets and Liabilities, Deposit Money Banks

(billion won)

	Assets			Liabilities		
	total	foreign currency denominated	share (%)	total	foreign-currency denominated	share (%)
1991	220,388.9	19,468.4	8.8	205,736.3	19,890.5	9.7
1992	251,321.4	21,936.1	8.7	235,470.7	21,802.8	9.3
1993	275,689.9	25,339.1	9.2	258,353.5	26,035.6	10.1
1994	322,956.2	32,294.4	10.0	302,300.1	32,856.3	10.9
1995	379,517.1	41,872.6	11.0	356,754.7	42,157.2	11.8
1996	451,180.2	55,390.7	12.3	426,074.9	55,445.4	13.0
1997 J	467,317.3	59,759.7	12.8	433,348.2	58,823.7	13.6
A	474,123.4	60,605.0	12.8	439,853.5	60,720.3	13.8
S	486,928.8	61,079.6	12.5	452,840.5	61,870.5	13.7
O	499,979.2	64,830.9	13.0	464,928.4	66,957.9	14.4
N	523,516.3	76,362.1	14.6	488,161.1	76,587.6	15.7
D	573,695.5	100,370.8	17.5	550,809.0	105,597.1	19.2
1998 J	587,023.5	105,081.9	17.9	554,035.1	116,204.9	21.0
F	593,032.3	114,330.5	19.3	558,806.3	121,549.8	21.8
M	568,554.5	100,139.0	17.6	532,861.5	101,892.1	19.1
A	557,955.0	96,606.7	17.3	521,434.1	98,887.7	19.0
M	559,347.1	101,118.8	18.1	521,442.7	103,574.4	19.9
J	558,430.3	96,174.0	17.2	522,543.7	98,821.8	18.9
J	552,177.6	84,909.6	15.4	516,205.7	87,797.6	17.0
1998 D	576,919.5	75,757.1	13.1	554,868.3	72,683.9	13.1
1999	640,011.2	61,181.4	9.6	611,824.4	57,534.5	9.4

Source: Bank of Korea, *Monthly Statistical Bulletin*, various issues

Appendix Table 10: Estimates of Subsidy through DMB Loans

(billion won)

	Loan for trade	Loans for machine industry promotion	Loans for equipment of export industry	Loans with NIF	Subsidy estimates
1963	0.2	n.a.	n.a.	n.a.	0.2
1964	0.5	n.a.	n.a.	n.a.	0.5
1965	0.8	n.a.	n.a.	n.a.	0.8
1966	1.0	n.a.	n.a.	n.a.	1.0
1967	1.5	n.a.	n.a.	n.a.	1.5
1968	3.1	n.a.	n.a.	n.a.	3.1
1969	4.7	0.5	n.a.	n.a.	5.2
1970	8.1	1.5	n.a.	n.a.	9.7
1971	12.2	1.9	n.a.	n.a.	14.1
1972	13.9	1.9	n.a.	n.a.	15.8
1973	19.0	1.9	1.1	n.a.	21.9
1974	36.1	2.6	4.2	1.2	44.1
1975	65.4	3.4	8.4	5.3	82.6
1976	90.4	4.8	11.9	15.0	122.1
1977	93.4	3.9	9.0	19.3	125.6
1978	107.3	2.5	5.3	20.0	135.0
1979	147.3	1.6	3.5	27.0	179.4
1980	151.9	0.6	1.3	31.1	185.0
1981	226.8	0.7	8.0	50.9	286.4
1982	271.0	0.3	n.a.	60.2	331.5

Note: Estimates are based on Tables 1, 2,3. For the purpose of estimation the amount of a loan for a given year is taken to be the same as the average of the outstanding loan amounts at the end of the year and of the previous year.

Appendix Table 11: KDB loans and Interest Rate

	KDB Loans to Manufacturing Sector (billion won)	KDB interest rate (percent)
1962	11.0	8.4
1963	11.9	8.3
1964	13.2	8.4
1965	16.4	9.6
1966	21.2	13.0
1967	24.6	13.1
1968	29.0	13.1
1969	37.3	14.7
1970	51.7	14.5
1971	65.4	14.4
1972	75.4	13.1
1973	79.0	12.8
1974	118.6	12.7
1975	186.7	12.9
1976	258.0	13.1
1977	377.4	13.6
1978	550.7	13.9
1979	856.8	13.9
1980	1348.9	18.7
1981	1771.2	17.1
1982	2097.6	12.7

Source: Bank of Korea, *Monthly Statistical Bulletin*, various issues.
Note: One representative interest rate was estimated for each year.

Appendix Table 12: Won-Dollar Exchange Rate

		end of period	period average
1980		659.9	607.9
1981		700.5	681.3
1982		748.8	731.5
1983		795.5	776.2
1984		827.4	806.0
1985		890.2	870.5
1986		861.4	881.3
1987		792.3	822.4
1988		684.1	730.5
1989		679.6	671.4
1990		716.4	708.0
1991		760.8	733.6
1992		788.4	780.8
1993		808.1	802.7
1994		788.7	803.6
1995		774.7	771.0
1996		844.2	804.8
1997	J	892.0	890.5
	A	902.0	895.9
	S	914.8	909.5
	O	965.1	921.9
	N	1,163.8	1,025.6
	D	1,415.2	1,484.1
1998	J	1,572.9	1,706.8
	F	1,640.1	1,623.1
	M	1,378.8	1,505.3
	A	1,338.2	1,392.0
	M	1,410.8	1,394.6
	J	1,385.2	1,397.2
	J	1,236.0	1,300.8
1998	D	1,207.8	1,213.7
1999		1,145.4	1,189.5

source: Bank of Korea, on-line service