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PRIVATE INFLOWS WHEN CRISES ARE ANTICIPATED:  
A CASE STUDY OF KOREA

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**ABSTRACT**

Models of financial crises based on distortions in capital markets have strong implications for the behavior of investors leading up to crises. In this paper we evaluate the hypothesis that deregulation of financial markets in Korea provided the incentives and opportunities for a sequence of capital inflows and crisis. We show that deregulation was associated with a sharp declines in the franchise value of Korean banks. Banks responded by expanding their balance sheets and accumulating high risk, high return assets. The regulatory mechanism appears to have failed because of the failure to consolidate onshore and offshore activities of banks. Foreign banks that supplied deposits to Korean banks behaved as if they were insured in that they did not discriminate between weak and strong Korean banks. Finally, this expectation was validated at the time of crisis by government intervention that allowed foreign banks to liquidate their claims on Korean banks.

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## **INTRODUCTION**

The economic costs of recent financial crises in emerging markets have been enormous. The predictable response has been calls to reform the system and there is no shortage of official and academic suggestions as to how architecture of the international monetary system could be improved. The problem with evaluating these proposals is that they are based on very different views about why crises have become so frequent and severe in recent years.

We do not think this very basic question can be answered by examining economic developments in the months or days just before and after a crisis occurs. The unfortunate fact is that regardless of the cause of a crisis its effects on asset values and economic activity are likely to be observationally equivalent. Fischer (1999) makes the point that a poorly managed liquidity crisis will generate permanent declines in the asset values that are identical to losses that are generated by distorted investment decisions. This seems to us correct and is a reasonable basis for government intervention once a crisis has occurred. But in considering how to improve the international monetary system's performance it is crucial to know whether recent crises were caused by distorted private

credit markets or by runs on otherwise healthy markets. If distortions were the fundamental problem it would be prudent to reduce the scale of IMF assistance packages and focus on capital controls and prudential regulation in developing countries. If runs were fundamental it would be prudent to expand the scale and flexibility of Fund programs and to focus on debt management policies in developing countries.

The purpose of this paper is to take a careful look at the \$120 billion private capital inflow to Korea from 1992 through the crisis in mid 1997. We will interpret this data within the analytical framework developed in Dooley (2000). The basic idea of the insurance model is that the microeconomics of financial intermediation and the government's role in financial intermediation are the primary sources of crises. Crises in this framework are not related to changes in private expectations or to inconsistencies in macro regimes. Instead the policy inconsistency arises from the desire of governments to accumulate financial assets in order to smooth national consumption and the desire to insure the domestic financial system.

The insurance model is particularly appealing when placed in the context of the Korean crisis. In Korea, banks were the major intermediaries of capital inflows before the crisis and, indeed, foreign creditors' run from Korean banks triggered the crisis in

November of 1997 (See Shin 1998). Thus, in the following pages we will attempt to interpret the recent crisis in Korea in the context of this model. The analysis suggests that financial liberalization in Korea was the fundamental factor behind the crisis.

Liberalization reduced the franchise value of the banking system and exposed very weak balance sheets to competitive pressures that promoted risk-seeking by banks. The second problem was the failure to regulate the consolidated balance sheet of commercial banks.

The failure to control foreign branches of Korean banks created an ideal vehicle for exploiting insurance. The important role played by interbank flows suggests that foreign banks expected to have preferred creditor status when the crisis occurred. The fact that foreign banks were able to withdraw about \$30 billion from Korean banks in 1998 suggests that this expectation was well founded.

The paper is structured as follows. In section II we provide background information on capital flows in the 90s up to and during the crisis. In section III, we discuss three analytic frameworks for crises and identify the insurance model as the most suitable alternative for the Korean case. In section IV, we analyze how actual developments in Korea fit the general case. Then, in section V, we raise and discuss an interesting question revealed by the Korean crisis: whether it was just coincidence that

capital inflows and a crisis followed liberalization. Lessons will be drawn to conclude the paper.

## **I. NATURE OF THE KOREAN CRISIS: BANK RUN PRECEDED BY PRIVATE CAPITAL INFLOWS**

### **POLICY STANCE AND CAPITAL FLOWS IN THE 80S**

Prior to the 1990s, Korea's policies on capital account liberalization were pursued in a passive manner and largely in reaction to the developments in the external current account (Figure 7.1). The exchange rate was rigidly managed and not allowed to respond to capital flows. As a result, the burden of financing current account deficits (surplus) was assigned to direct quantitative controls over flows. For example, in the first half of the 1980s when the current account showed chronic deficits, various liberalization measures were taken to induce capital inflows. In particular, the Korean government guided domestic banks to borrow from abroad. As a result, Korea saw significant net capital inflows, most of which consisted of bank borrowings (Figure 7.2).

In the late 1980s, the policy stance toward capital flows changed dramatically as the current account balance began to show a large surplus. Instead of allowing the

domestic currency to appreciate, the government resorted to quantitative capital controls in an effort to manage the overall external balance. External borrowing by domestic firms, with the exception of public enterprises, was prohibited. The overseas issuance of bonds and depository receipts by residents was also restricted. In addition, banks were advised to reduce their exposure to external debt.

### **Capital Account Liberalization in 1990s**

In the early 1990s, the benefits of capital account liberalization were considered in their own right for the first time. Market reform and globalization became key words in policy agenda. In fact, the Y.S. Kim administration declared “se-gye-wha” (globalization) as the top policy priority. Roughly balanced current accounts during the years were thought to be favorable conditions for pursuing liberalization.

Given the changed policy environment, the government began capital account liberalization. Overseas issuance by domestic firms of foreign-currency-denominated bonds was deregulated in 1991. In January 1992 the Korean stock market was opened to foreign investors for the first time. Commercial loans by domestic firms, which had been prohibited since 1986, were allowed in 1995.

However, for portfolio flows the Korean government remained cautious and preferred gradual liberalization. Thus, both of explicit quantity restrictions and discretionary controls remained prevalent. For stock investment, a 10% aggregate ceiling on the foreign ownership of listed firms was imposed. This ceiling continued to exist until the crisis of 1997, although it was relaxed to 12% in December 1994 and further to 15% in July 1995. And regarding commercial loans by firms, restrictions on the uses of funds existed and government approval was required. Likewise, the overseas issuance by domestic firms of foreign currency denominated bonds was subject to discretionary quantity control.

Thus, most capital flows led by firms or through the stock market were not free from explicit or implicit quantitative controls. The only exception was trade related short-term financing. Various restrictions on deferred import payments and the receipt of advance payments for exports were lifted step by step throughout the 90s.<sup>1</sup>

In contrast, the government allowed banks to enjoy relatively greater freedom in borrowing from foreign creditors. No explicit quantity regulations existed on long-term or short-term borrowings of banks in foreign currencies. Though the government exerted

discretionary control over banks, it has not been binding or restrictive (at least) since the mid-nineties judging from the rapid increase in capital inflows channeled through banks.

### **Capital Inflows in the 90s**

The Korean economy had experienced net capital inflows since 1990. The magnitude of inflows remained small in the first four years at 1.2 % of GDP on average. But for the three years from 1994 to 1996, the size of inflows more than doubled to 3.5 % of GDP on average (Figure 7.2).

Increased capital inflows for the three years displayed two salient features. First, debt instruments were the dominant vehicles for capital transactions. Debt instruments accounted for the bulk of total foreign portfolio investment (Figures 7.2 and 7.3). Stock investment by foreigners explains only a limited portion of capital inflows, which seems to be a reflection of quantity restrictions mentioned above. Consequently, the surge in net capital inflows was tantamount to a sharp increase in Korea's external debt (Figure 7.4).

Second, the major portion of the increase in external debt involved the banking sector (Table 7.1). Out of the total increase in external debt during the three years, the banking sector explains about 70%. The remaining 30% reflects growth of the corporate sector's external debt related to trade financing. In addition the total foreign currency

liabilities of banks were much larger than their external debt. As part of liberalization measures, banks were allowed to open and expand operations of overseas branches.

Banks exploited this opportunity aggressively so that the value of foreign currency liabilities of overseas branches was comparable to the external debt of domestic branches

(Table 7.2).

### **Creditors' Run in November**

Accumulation of foreign currency liabilities in banks and associated risks culminated in a crisis late in 1997. As shown in Figure 7.5, foreign creditors ran the Korean banks in November. Though foreign capital invested in stocks also flowed out at the same time, in terms of magnitude its role remained minor.

Based on the capital account balance, the amount of foreign currency borrowing that creditors refused to refinance in November may appear too small to justify the word "run." However, the actual magnitude of the creditors' run in November was much larger than suggested by the capital account balance for two reasons. First, banks repaid some of their debt by selling external assets, which reduced the stock of deposits to be rolled over. Second and more important, the larger portion of the run was targeted at overseas

branches of the Korean banks, a run not captured in the capital account balance because the Bank of Korea replaced these deposits.

Although official data on the creditors' run in November are not available, it is possible to estimate the magnitude of private withdrawals. As the run occurred, the Bank of Korea acted as the lender of last resort and provided foreign currency liquidity to troubled banks by increasing the Bank of Korea's foreign currency deposits in those banks. Taking the increase in the Bank of Korea's deposits as an indicator for the size of run, we note that it reached an astounding US\$15 billion in November. About \$9 billion of this was deposited directly in foreign branches of Korean banks. This bailout exhausted the foreign exchange reserves of the Bank of Korea (Table 7.3).

### **Banking Panic in December**

The Korean government announced its plan to resort to the IMF rescue loans on the 21<sup>st</sup> of November. Apparently it failed to calm foreign creditors and the severity of the run intensified. According to unofficial data the of Bank of Korea, rollover of credits by foreign banks for the 7 largest Korean banks continued to decline in December (Table 7.4). This was probably related to a cascade of bad information on the size of the short-

term external debt of Korea relative to foreign exchange reserves, as well as Moody's and S&P's downward adjustment of the sovereign credit of Korea.<sup>2</sup> The run that began in November was followed by a typical banking system panic.<sup>3</sup>

### **Deficiency of Currency Attack Models**

The description of the Korean crisis in the previous section is a familiar sequence of private capital inflows and crises. There are at least three analytic frameworks that might help us understand the mechanics underlying this sequence.

The first is the macro-fundamental model or the first generation model of speculative attacks on currencies developed by Krugman (1979). In Krugman's model the driving force is a conflict between the government's exchange rate commitment and its fiscal/monetary policy. As long as the fixed exchange rate regime survives, a deficit is financed by gradual reductions in the government's reserves. On the day the attack occurs the government's reserves fall discreetly to zero and the exchange rate is allowed to float.

Confidence in these models as complete explanations of crises has been eroded by the observation that, in many cases, the underlying policy conflict seems to be missing.<sup>4</sup>

The ERM crisis in 1992 and the Mexican crisis of 1994 have been cited as examples of

crises not preceded by policy conflicts. Moreover, an important empirical regularity associated with recent crises in emerging markets is that speculative attacks are preceded by very large private capital inflows into the country. The lack of policy conflicts and prior capital inflows are repeated in the Korean case as well, which suggest the irrelevancy of the first generation model for the Korean crisis.<sup>5</sup>

The second framework, or the second generation models, explains crises in terms of the fundamentals identified in first generation models, but the fundamentals are themselves sensitive to shifts in private expectations about the future. This is a radical departure in that it implies that a consistent macro regime is vulnerable to speculative attacks and crises.

Several papers have examined crises in emerging markets and concluded that shifts in private expectations are important elements in an attack sequence in some cases.<sup>6</sup> But, they do not seem to provide a convincing story for the events in Asia including the Korean crisis. As with first generation models, they do not explain why there were capital inflows in the first place. Besides, foreign creditors' run from foreign branches of the Korean banks are not easy to understand in this framework, since they were free from foreign exchange risk.

In some sense, deficiency of these two frameworks in explaining the Korean crisis is destined by their nature. They are designed to explain *speculative attacks to currencies*. In other words, they are to explain capital outflows based on agents' arbitrage over expected price (exchange rate) changes. Therefore, understanding massive capital inflows and speculative attacks to financial intermediaries that may not be related to exchange rate risk are simply beyond their focus.

### **Alternative Framework: Insurance Attacks**

Dooley (2000) develops an alternative first generation model that seems to be consistent both with private capital inflows preceding a crisis and the absence of devaluation expectations. The policy conflict in the background in the model is between the desire of a credit-constrained government to hold reserve assets as a form of self-insurance and the government's desire to insure financial liabilities of residents. The first objective is met by the accumulation of foreign exchange reserves. The second objective generates incentives for investors to acquire the government's reserves when yield differentials make this optimal.

The insurance model predicts that three fundamentals must be present in order to generate a private capital inflow followed by a speculative attack. The first is that the

government must have positive net international reserves. Net reserves in this model are defined to include contingent assets and liabilities. Second, the government's commitment to exhaust these net reserves to pay off an implicit or explicit insurance contract must be credible. That is, it must be consistent with the government's incentives and ability to mobilize and exhaust its net worth after the attack begins. Third, private investors must have access to transactions that produce insured losses. As long as one ingredient is missing there will be no capital inflow and no crisis. Therefore, crisis episodes are associated with the relaxation of a *binding* constraint.

These ingredients provide a plausible capital inflow-crisis sequence. The availability of free insurance raises the market yield on a set of liabilities issued by residents for a predictable time period. This yield differential generates a private gross capital inflow (a sale of domestic liabilities to nonresidents) that continues until the day of attack. The private inflow is necessarily associated with some combination of an increase in the government's international reserve assets, a current account deficit and a gross private capital outflow. But the distribution among these offsetting transactions is unimportant.

As long as the “foreign” investors earn above market yields there is a disincentive for an attack on the government’s assets. Investors will prefer to hold the growing stock of high-yield insured liabilities of residents and allow the government to hold reserves that earn the risk-free rate. Private profits are realized before the attack.

The attack itself is generated by competition to avoid losses. When the contingent liabilities of the government are just equal to the government’s assets, competition among investors will insure that all will call the insurance option. The incentive to do so is that, given plausible assumptions about asset markets, from that date forward, yields on insured deposits will fall below market rates.

Following an attack the regime returns to its initial equilibrium in which the government’s net international reserves have returned to zero. The loss of reserves might force the government to abandon its commitment to manage the exchange rate. An observer determined to apply a currency attack model will have to appeal to multiple equilibria. In fact, there is no shift in expectations.

### **Banking Crises associated with Insurance Attacks**

The empirical association between banking and currency crises itself is well established. Gavin and Hausmann (1995) document the relationship between lending

booms and financial crises in Latin America. Kaminsky and Reinhart (1996) show, in a sample of 76 balance of payments crises and 26 banking crises in 20 developing countries from 1970 to 1995, that about one-quarter of the banking crises occur within one year of a balance of payments crisis. Their interpretation of the evidence is that balance of payments crises were unrelated to banking crises during the 1970s when financial markets within these countries were highly regulated. Following liberalization of domestic financial markets in the 1980s, banking and balance of payments crises were closely linked and banking crises preceded balance of payments crises.

Goldfajn and Valdes (1997) examine four recent examples of banking/balance of payments crises in Finland, Mexico, Sweden and Chile. In each case capital inflows preceded the crises by three to six years and lending booms occurred in domestic banking markets over the same intervals. The crises were followed, except in the case of Sweden, by substantial capital outflows and in all cases by a sharp reduction in bank credit. Their model suggests that intermediation involving maturity transformation is likely to increase capital inflows relative to equilibria in which there is no intermediation but at the cost of increasing the probability of a run on the banking system. Since the run on the banking

system depletes reserves it also increases the chances that a fixed exchange rate regime is abandoned.

This literature has clarified two important points. First, the government's net reserves support two policy regimes: the banking/financial system and the exchange rate regime. An attack on either regime that exhausts reserves will necessarily have important implications for the other regime. This will make identification of the causes of a crisis difficult.<sup>7</sup> Second, rapid growth in the stock of bank credit may be an early warning that potential losses in the financial system and the associated contingent government insurance liability are approaching a crisis level.

## **II. PRIVATE INFLOWS MOTIVATED BY INSURANCE FUND: THE CASE OF KOREA**

### **Specifying Pre-conditions for Insurance Attack in Korea**

The model set out in Dooley (2000) is a very stylized model of bank behavior. To confront the Korean data we first must develop a more realistic model. We interpret Dooley's insurance model as a banking crisis model in an open economy where claims on banks are guaranteed by the government. Given the interpretation, we may relate it to the rich literature on banks' behavior in the presence of deposit insurance in a closed

economy. In this line of literature, insured banks seek to maximize the value of their deposit insurance options by selecting the riskiest available asset portfolio (Merton 1977). An immediate implication of this is, in the presence of insurance, *without other checking mechanisms* banking failures and crises should be prevalent. Checking mechanisms include: the franchise values of banks, capital regulation and monitoring by supervisory authorities (Merton 1978, Buser, Chen and Kane 1981, Marcus 1984).

It follows that there are three conditions under which dangerous capital inflows through banks might occur. 1) Lack of self-monitoring (risk management) by banks due to declines in franchise values. 2) Lack of adequate supervisory monitoring. 3) Lack of foreign creditors' monitoring due to government guarantee which is validated by sufficient insurance funds. We will examine whether and how these conditions were satisfied in Korea before the crisis.

### **Declines in Franchise Values of Korean Banks in 90s**

Throughout the 1980s and until 1992 stocks of banks in Korea had been market performers. But since 1994 they have become under-performers, in stark contrast with the merchant banking industry (Figure 7.6). This stock market performance suggests that the

franchise value of commercial banks was declining, perhaps because of expectations that the financial markets would become more competitive as they were liberalized.

The decline in franchise values was associated with changes in the asset structure of banks. Namely, judging from the aggregate balance sheet of banks, the Korean banks were increasingly taking larger risks. As Figure 7.7 shows, banks were replacing cash, call loans and deposits with securities in their asset portfolios. Since securities are exposed to price changes, this led to larger market risk of the banks.

More importantly, credit risks of assets were also increasing. First of all, among the total credits provided by banks the portion of credits without collateral was rising (Figure 7.8). Secondly, the portion of consumer loans was expanding in the composition of total loans by type (Figure 7.9). Third, in the case of loans to firms, lending to small and medium firms began to explain increasingly larger portions in comparison to lending to large firms (Figure 7.10). All of these three changes indicate that the asset structure was moving to exacerbate asymmetry problems between banks and borrowers, raising the associated credit risks.

Moreover, banks were taking large liquidity risks in their foreign currency positions. By regulation, Korean banks were not allowed to take net open currency positions exceeding

certain limits and thus were protected from currency risk. But, maturity mismatches between assets and liabilities in foreign currencies were very large. Measuring the severity of the mismatch problem by a one-month mismatch gap, as of early 1997 the seven largest banks were taking large foreign currency liquidity risks (Table 7.5).<sup>8</sup> Hence, declines in the franchise values of banks and an increase in risk of asset structure was emerging as a characterizing feature of Korean banks in the 90s.

### **Growth of Assets without Capital**

Despite the dismal stock market performance and risky asset structure, the volume of banking assets was growing rapidly. Over the five years from 1992 to 1996 banks' assets more than doubled. Considering that annual inflation rates had been moderate at 5.3% on average, this was remarkable growth in real terms.

Moreover, the growth was achieved while a corresponding increase in capital was absent, leading to a decline of capital asset ratios (Figure 7.11). A vicious cycle of declines in franchise values and reaching for risk was evident well before the crisis. In the presence of the government's implicit guarantee it is easy to understand that bank owners did not have incentives to self-monitor or manage risks while franchise values were decreasing. Under the circumstance their best strategies must have been to exploit

insurance option values as discussed in Merton (1977). What remains to be explained is why foreign creditors and the regulatory authority indulged the adverse development?

We'll take up the two questions consecutively.

### **Did Foreign Creditors Lend on Individual Creditworthiness of Banks?**

As Figure 7.12 shows, more than half of the assets of the Korean banks has been denominated in foreign currencies since 1988. Since the Korean banks have not been allowed to hold net open foreign currency positions and since nonbank residents' foreign currency deposits are negligible, it follows that foreign creditors funded more than half of the growth in bank assets. Did nonresident lenders evaluate the behavior of Korean banks or did they assume that their loans were insured by the government?

Figure 7.13 shows trends in foreign currency liabilities of the six largest private commercial banks and various bank performance variables. The expansion in foreign currency liabilities of banks for the three years before the crisis was quite remarkable. Compared to the sluggish growth pattern in previous years, it certainly suggests an important structural change in 1994.

While faster growth than previous years is common to all of the six banks, we are particularly interested in two banks: Korea First Bank and Seoul Bank. This is so because

they were the most troubled banks during the period of strong capital inflows. Capital of both banks was found completely eroded and so the government was forced to intervene in December of 1997. Although both banks were industry under-performers even before the crisis, in foreign currency liabilities they displayed quite contrasting trends. Korea First Bank recorded the highest growth rate and Seoul Bank the lowest with considerable margin. But, we do not believe that the inability of Seoul Bank to expand foreign currency operation was due to foreign creditors' screening. Rather it appears that the Bank's expansion was limited by the supervisory authority's restriction. Even in terms of the supervision standard before the crisis Seoul Bank was considered in trouble and discretionary restrictions were imposed on its domestic and foreign operations. Therefore we believe that the Korea First Bank should be focused on as a valid test case for foreign creditors' behavior. Foreign creditors' lending policy was not based on individual bank's creditworthiness.

To generalize our argument, we compute correlations of growth rates of six banks with various performance and capital status variables (Table 7.6). In order to account for other characteristics of each bank, we use growth rates over the three years from 1994 to 1996 normalized by growth rates over the previous three years.

The results can be summarized as follows. When Seoul Bank is included, the growth rate of foreign currency liabilities does not show a statistically significant relationship with any variable considered. And, albeit insignificant, it is estimated to have negative relationships with capital variables. However, when Seoul Bank is excluded, negative relationships of the growth rate with all the variables are estimated and statistically significant in performance variables. Hence we conclude that evidence supports the view that foreign creditors did not monitor or react to the creditworthiness of individual banks.

The fact that foreign creditors were not looking at the status of individual banks strongly suggests that their lending decisions were based on the insurance fund, namely the ability of the government to fulfill its implicit guarantees of banks' foreign currency liabilities. To test the implication, we implement granger causality tests between foreign currency reserves of BOK and liability capital inflows (Table 7.7). The result shows that, if any, causality runs from changes in reserves to capital flows.

### **Caveats in Regulation and Supervision: How Were They Created?**

As capital asset ratios declined regulation and supervision were less than adequate. Capital regulation according to the BIS standard was introduced in 1992 in Korea. And

the banks were required to maintain the ratio of at least of 7.25% at the end of 1993 and to meet the full 8% by the end of 1995. On the surface, the Korean banks had no difficulty in meeting the capital requirement. According to published statistics by the Office of Supervision, the BIS capital ratios averaged across the city banks had been declining slightly but always over 8% (Table 7.2). However, Shin and Hahm (1998) explain why the numbers are misleading. In general, there can be two ways that regulatory authorities manipulate the BIS capital ratios. One is applying “soft” accounting rules. The other is allowing “flexibility” in enforcing the regulations. Shin and Hahm (1998) shows that both of them were prevalent in Korea before the crisis.

Why did regulators let the sorry state continue and the banks expand? To better understand failures of banking supervision in Korea, we must look first at the traditional modus operandi of the supervision, which was “direct quantity control.” As is well known, Korea succeeded in keeping fiscal soundness and monetary stability throughout the 1980s and early 1990s until the crisis. The major tool at the aggregate level had been monetary targeting based on aggregate quantities like M2 and MCT. Given that the financial market was repressed, monetary targeting inevitably resulted in the government’s heavy reliance on direct quantity controls in many areas. Controlling the

amount of financial flows for the purpose of containing excessive monetary expansion thus became a well-established policy in Korea. As a result “*direct discretionary quantity controls*” at both aggregate and microeconomic levels were bread and butter for policy makers in managing all the financial risks.

This way of managing financial markets, however, made microeconomic risk management redundant. The government set the targets for aggregate money growth rates, inflation rates, exchange rates and interest rates and then utilized all the available intervention tools to achieve the targets. Within these constraints there was very little room to exploit government insurance.

While the costs to efficiency were probably high, the policy mechanism worked well enough to attain macroeconomic and financial stability for the Korean economy for decades. It is not surprising therefore that while the government pursued financial liberalization, it did not completely relinquish direct controls on financial flows and was confident such controls would continue to maintain financial stability.

One interesting example of the coexistence of liberalization and direct controls was direct quantity control on stock issues of banks. In order to ‘stabilize’ the stock market the government kept control over new stock issues of banks and in 1995 permitted

only 30% of the amount originally planned by banks.<sup>9</sup> That is, the problem of capital shortage of banks was not only known to the government but aggravated—a good example illustrating the government’s belief that macroeconomic stability could be obtained through the old way of going about business.

It seemed that to the last minute before the crisis in 1997 the government had succeeded in maintaining macroeconomic and financial stability. Inflation rates were lower than ever and the fiscal account was balanced. Besides, M2 growth rates seemed to be stable. What went wrong? Why and how did the government fail to detect increasing vulnerability of the economy? This was so because capital account liberalization provided a loophole in the traditional management system through which banks could increase the risk of insurance attack or run. As pointed out above, about half of the foreign currency operations of the banking sector was handled by overseas branches. Since these transactions were not reflected in domestic monetary indicators, it was impossible for policy makers to detect this new development when watching traditional macroeconomic measures.

In sum, caveats in supervision were there simply because the traditional modus operandi of supervision left some areas not watched by the policy makers which quickly became a new source of risk by enabling banks to exploit implicit insurance.

## **DISCUSSION AND LESSONS**

In retrospect, one cannot but wonder whether there was anything new in the Korean crisis. In the presence of implicit or explicit deposit insurance, there are numerous examples of crises generated by changes in banks' incentives to exploit insurance. The triggers for such episodes are changes in the environment following financial liberalization.

Following the debt crisis of 1982 free deposit insurance extended to banks in newly liberalized financial markets was widely cited as a source of instability in financial markets (McKinnon and Mathieson (1981), Hanson and de Melo (1983), Diaz Alejandro 1985), Corbo, de Melo, and Tybout (1986), Balino (1991), McKinnon (1991), Velasco (1991)). The argument familiar to similar discussions in the context of banking markets in industrial countries is that a deadly brew of free insurance, undercapitalized banks, unrestricted competition for deposits and poor prudential regulation and supervision induces banks to reach for risk (Akerlof and Romer (1993), Kane (1996)). Several

authors identified the competition for deposits to make high-risk loans as a partial explanation of apparently high real loan rates in reformed markets.

One can find dramatic examples of this process in both developed and developing countries. The combination of deposit insurance and a relaxation of controls over deposit rates and portfolio selection in the United States led to explosive growth in inflows into savings and loans and to their eventual collapse. The problem, clear in retrospect, was that the contingent liability of the United States' government provided the private investor with a virtual guarantee that high yields offered by savings and loan deposits would not be matched by depositors' losses. Depositors did not question the ability of some savings and loans to offer deposit rates 200-400 basis points over the market. As long as deposits were "probably" guaranteed there was little downside risk.

### **Elimination of Deposit Insurance?**

The fact that neither developing nor developed countries were immune to the trap of liberalization and crises raises a question of how solutions can be found. Since the existence of government insurance constitutes a fundamental condition for crises eruption, one may argue for the elimination of it. However, this is easier said than done. It should be noted that in many developing countries including Korea, no explicit deposit insurance

existed before crises, although it was taken for granted. It suggests that given policy makers' preference, market agents should regard ex-post bailout of depositors as a time consistent equilibrium. Therefore, unless one can figure out elaborate institutional settings that will support no bailout as time consistent solution, elimination of deposit insurance would not work.

### **Discretionary Capital Account Liberalization?**

If insurance for banks or depositors cannot be denied credibly, one may argue that capital flows by insured domestic agents should be subject to restrictions. In particular, limiting the access of investors to domestic financial intermediaries or some class of domestic assets eliminates the market distortion. It follows that portfolio and direct investment that characterized inflows to emerging markets after 1990 is not guaranteed by the debtor government and so is more likely to be welfare improving.

However, the flaw in this line of reasoning is that governments have strong incentives to maintain the market value of nonfinancial firms' liabilities in the face of a change in the private sector's preferences for domestic assets. This is because such firms are heavily indebted to the domestic banking system. If nonresident creditors want out these firms can be expected to ask for and receive credit from the domestic banks. To

refuse to do so would depress the market value of the banks' existing claims on the domestic firms and call into question the solvency of the domestic banking system.

This does not mean that capital controls are necessarily ineffective. But it does mean that controls would have to be comprehensive. It is well accepted that control programs can change the structure of capital flows but the evidence that controls can limit capital inflows in the face of incentives to exploit insurance is much less clear.

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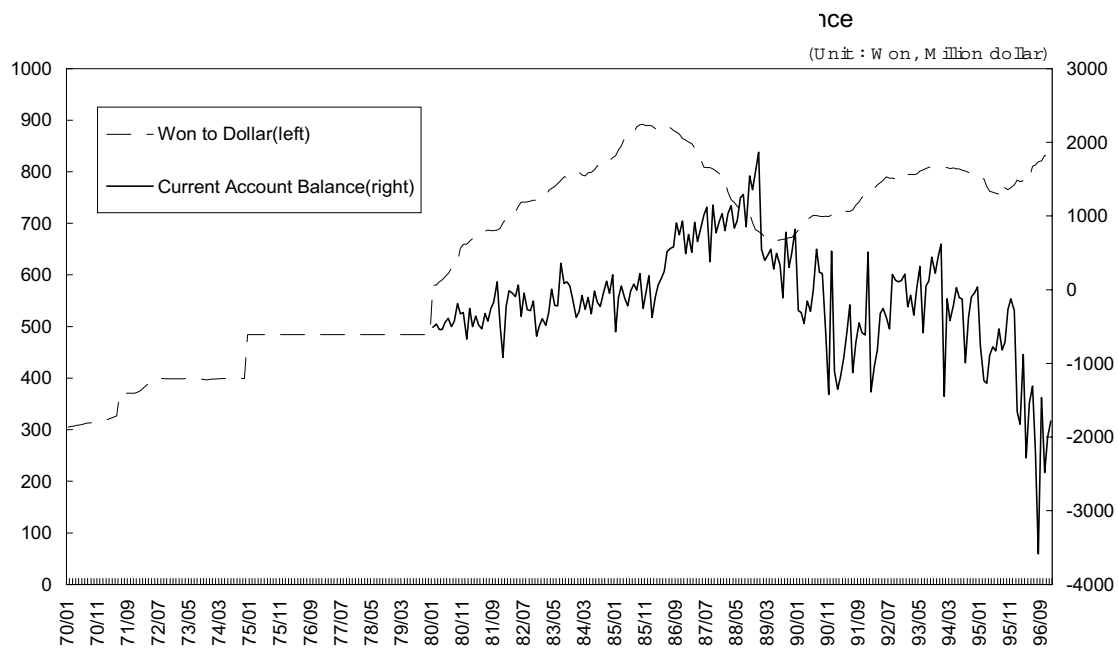
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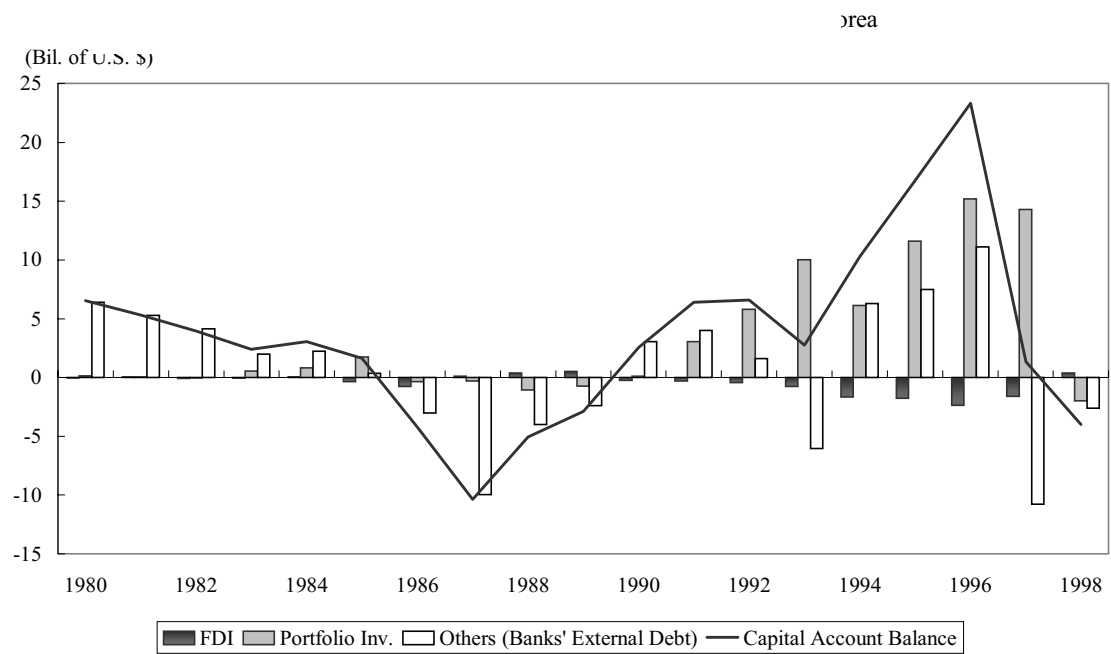
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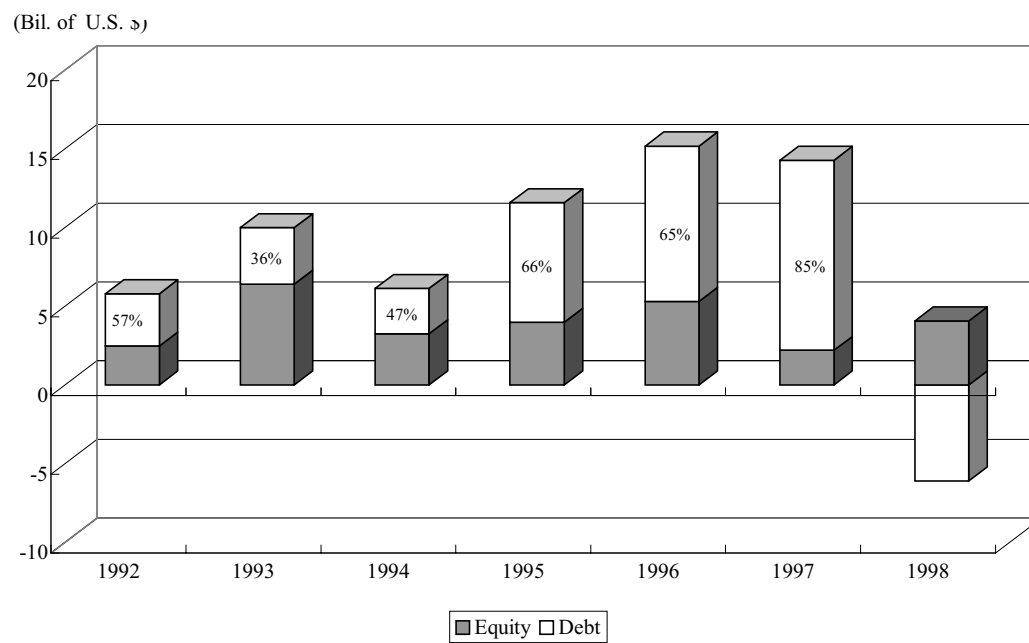
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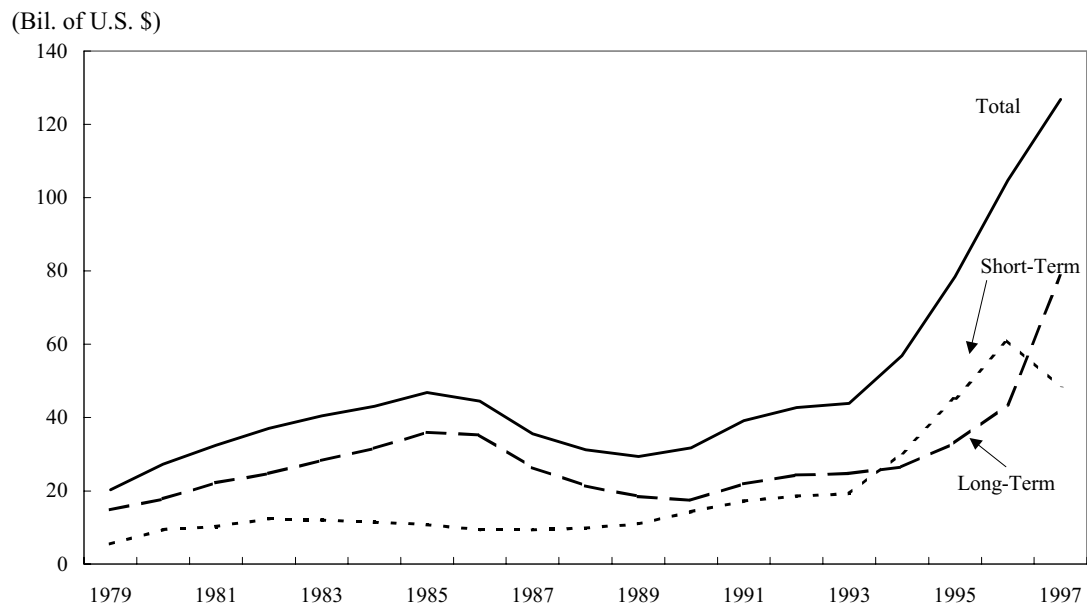
**Figure 7.1. Trends of Exchange Rate and Current Account Balance**



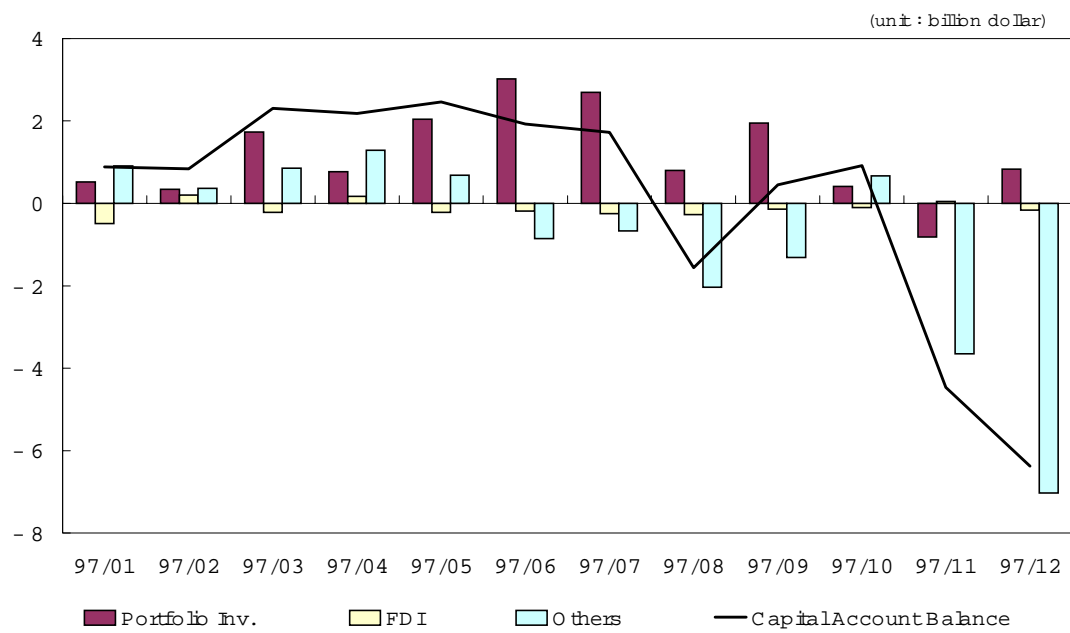
**Figure 7.2. Trends and Composition of Net Capital Inflows to Korea**

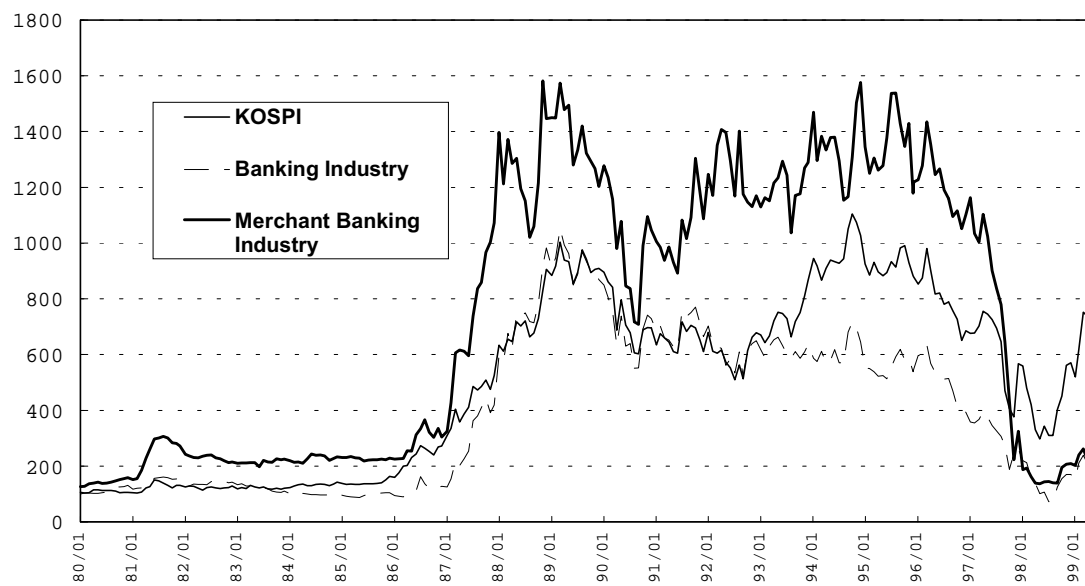


**Figure 7.3. Composition of Portfolio Investment**

**Figure 7.4. Trend and Composition of External Debt**

**Figure 7.5. Capital Flows in 1997**



**Figure 7.6. Stock Market Performance of the Korean Banks**

**Figure 7.7. Composition of Total Assets: By Type**

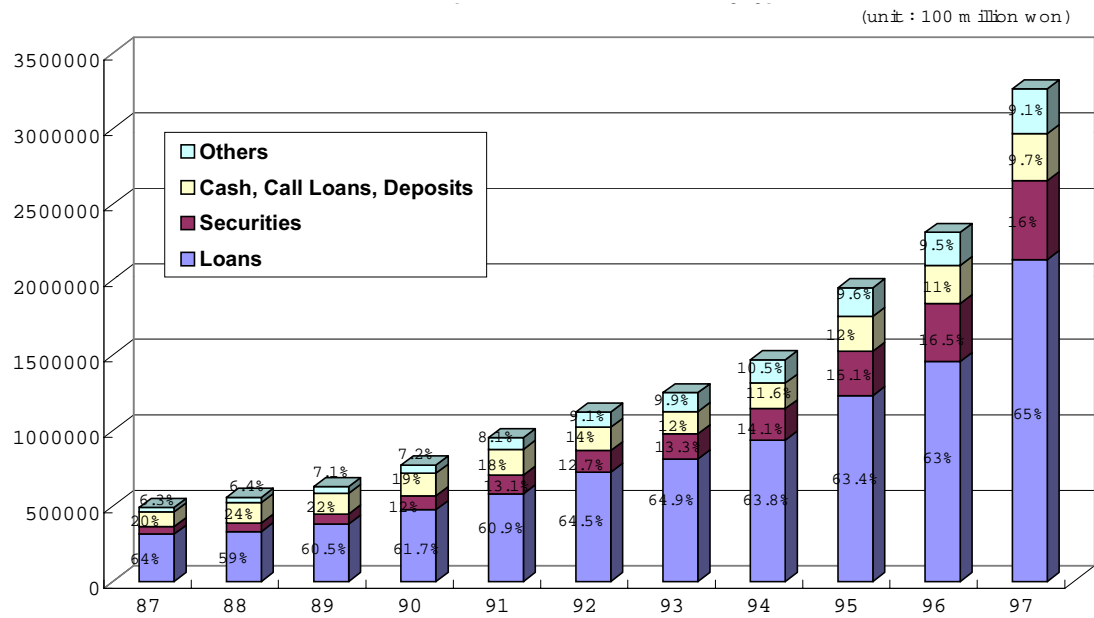
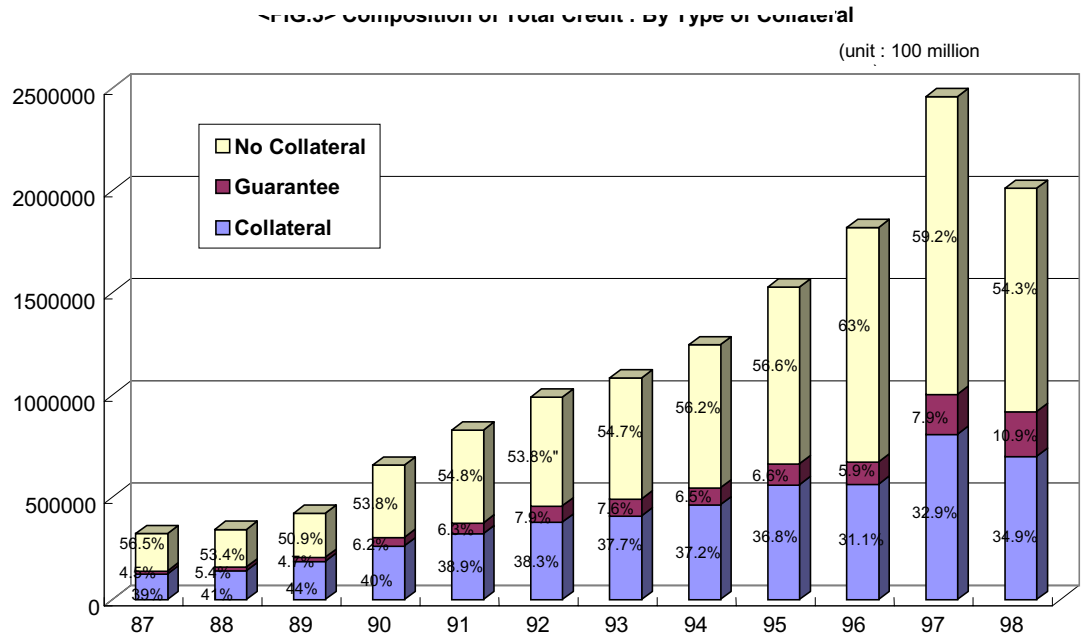
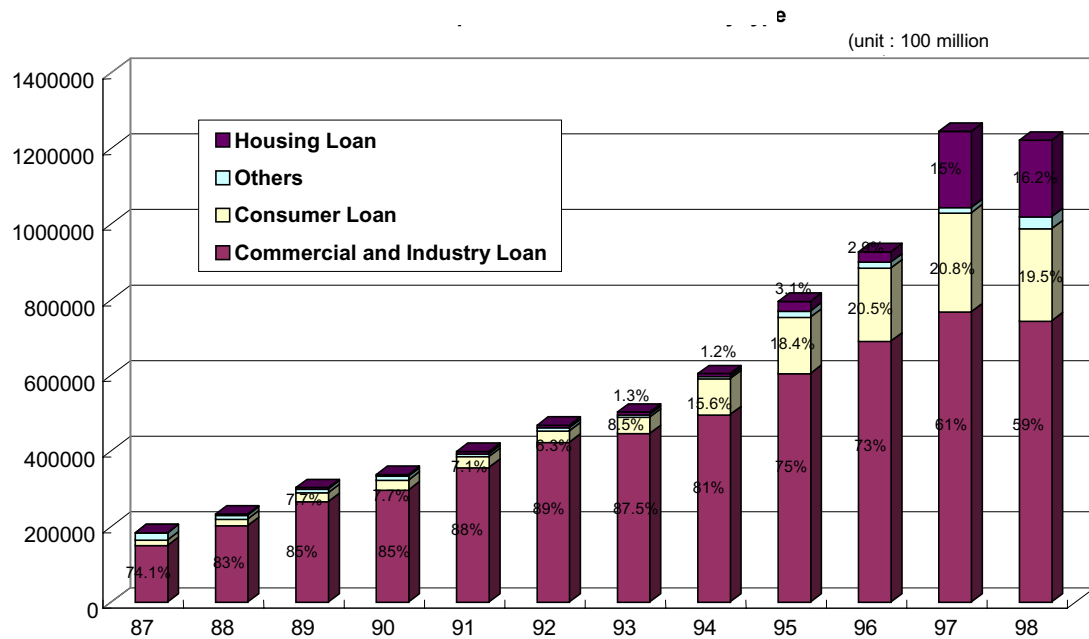


Figure 7.8. Composition of Total Credit: By Type of Collateral



**Figure 7.9. Composition of Total Loans: By Type**



**Figure 7.10. Composition of Commercial and Industrial Loans: By Firm Size**

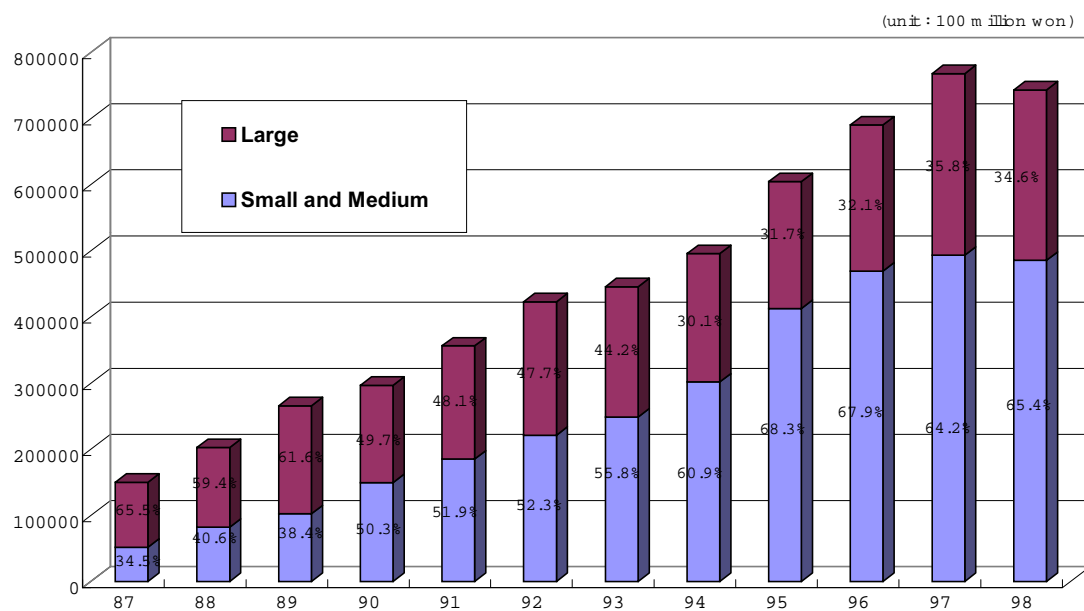
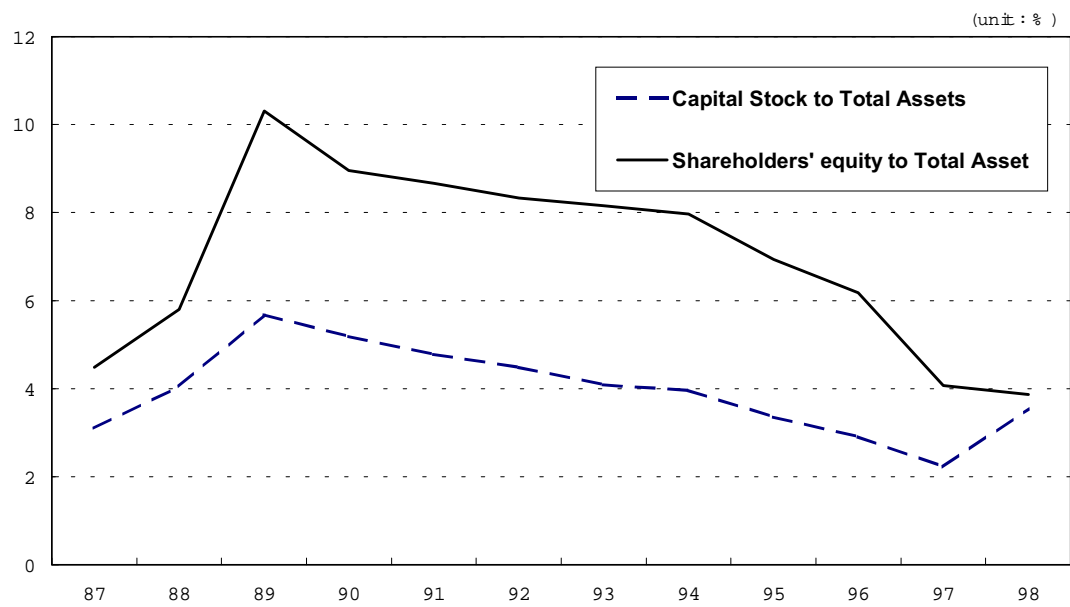
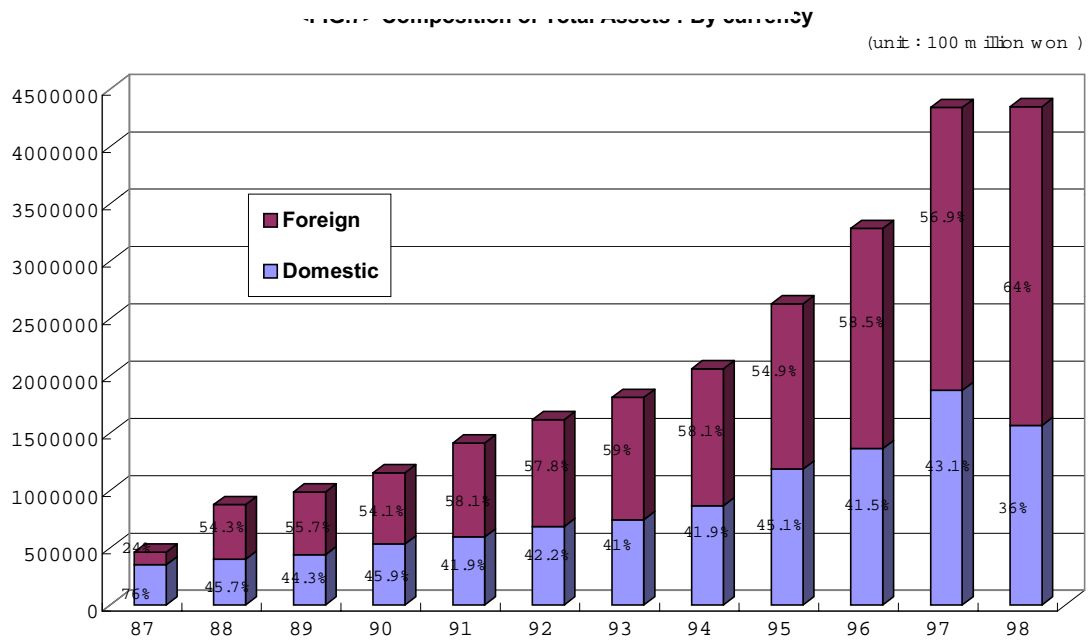


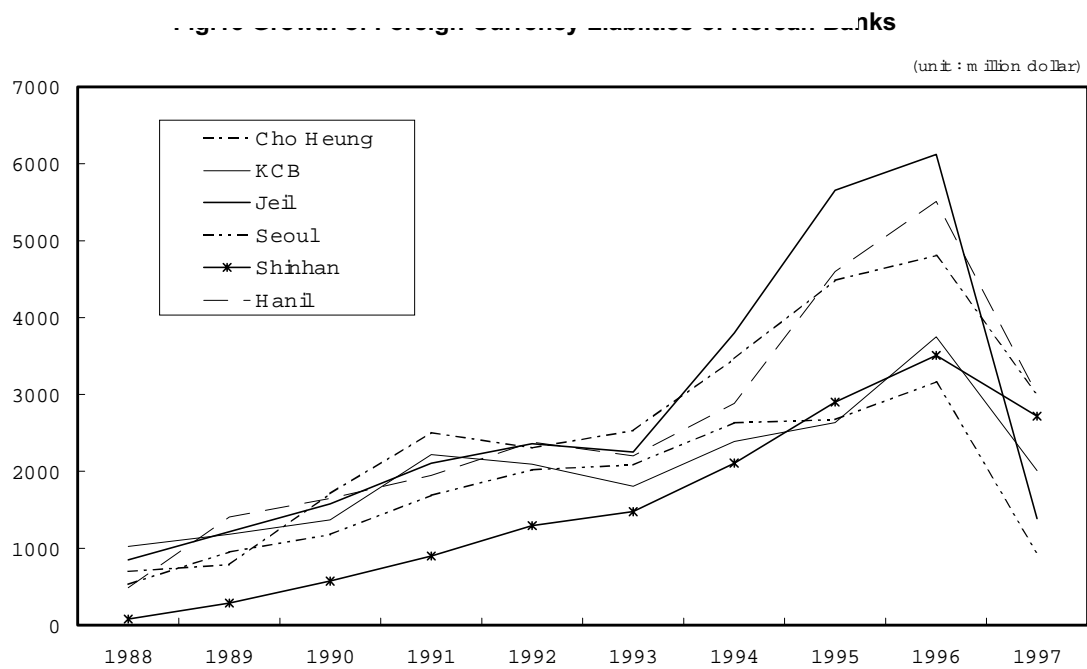
Figure 7.11. Capital Asset Ratio



**Figure 7.12. Composition of Total Assets: By Currency**



**Figure 7.13. Growth of Foreign Currency Liabilities of Korean Banks**



**Table 7.1. External Debt by Sector**

(US\$100million)

	1992	1993	1994	1995	1996	1997
Public Sector	56	38	36	30	24	223
(Long-Term)	(56)	(38)	(36)	(30)	(24)	(223)
(Short-Term)	0	0	0	0	0	0
Corporate Sector	137	156	200	261	356	462
(Long-Term)	(65)	(78)	(90)	(105)	(136)	(253)
(Short-Term)	(72)	(78)	(110)	(156)	(220)	(209)
Financial Sector	235	244	333	493	667	584
(Long-Term)	(122)	(130)	(139)	(196)	(277)	(310)
(Short-Term)	(113)	(114)	(194)	(297)	(390)	(274)
Total(A)	428	439	568	784	1,047	1,268
(Long-Term)	(243)	(247)	(265)	(331)	(437)	(786)
(Short-Term)	(185)	(192)	(304)	(453)	(610)	(482)
A/GNP(%)	14	13.3	15.1	17.3	21.8	28.6

**Table 7.2. Foreign Currency Liabilities of Korean Banks**

(US\$100million)

	1992	1993	1994	1995	1996	1997
Domestic Branches	157	163	226	363	507	387.9
Foreign Branches	201	231	317	413	529	312.5
Sum	358	394	543	776	1,036	700.4

**Table 7.3. BOK's Foreign Currency Deposits in Korean Banks**

(US\$100million)

	11/3-11/7	11/10-11/14	11/17-11/21	11/24-11/28	Sum
Domestic Branches	-9.9	-10.6	35.0	41.2	55.7
Foreign Branches	0.5	7.9	19.4	61.3	89.1
Sum	-9.4	-2.7	54.4	102.5	144.8

**Table 7.4. Rollover Rates of Seven Largest Banks**

(Unit : %)

Week	July	Aug	Sep	Oct	Nov	Dec
1 <sup>st</sup>	157.3	64.1	82.2	83.7	70.0	23.7
2 <sup>nd</sup>	95.5	84.8	82.8	83.9	67.2	26.8
3 <sup>rd</sup>	83.6	86.9	84.1	80.5	55.9	26.2
4 <sup>th</sup>	76.1	76.2	89.8	84.9	48.7	31.9
5 <sup>th</sup>	87.5		127.3			53.3
Average	89.1	79.2	85.5	86.5	58.8	32.2

**Table 7.5. Mismatch Gap Ratios of Seven Largest Banks**

(March 1997, %)

A Bank	B Bank	C Bank	D Bank	E Bank	F Bank	G Bank	Average
21.9	27.5	22.4	23.3	20.2	16.8	11.3	20.3

**Table 7.6. Relationship of Foreign Currency Liabilities of Banks  
with Other Variables**

(Unit: Won, %)

	Growth rate	ROA	ROE	Stock Price	Capital ratio	Net worth ratio
Cho Heung	2.78	0.41	5.98	9,701	3.23	6.52
KCB	4.43	0.30	4.80	7,841	3.54	6.23
Je Il	5.77	0.18	2.85	8,588	3.03	6.86
Seoul	1.19	-0.14	-2.09	6,937	4.23	6.84
Shin han	2.25	0.72	7.76	15,702	3.32	9.65
Han Il	5.98	0.33	4.80	9,067	3.36	7.33
Correlation		0.7479	0.2411	-0.224	-0.6298	-0.2592
Coefficient		0.13	0.522	-0.0001	-2.96	-0.41
		(0.28)	(3.48)	(0.0003)	(1.82)	(0.77)
Correlation②		-0.8255	-0.8668	-0.7051	-0.1542	-0.4697
Coefficient②		-6.91	-0.81	-0.0003	-1.41	-0.58
		(2.73)	(0.27)	(0.0002)	(5.19)	(0.63)

Data Source: Bank Management Statistics, BOK, 1995-1998, Korea Stock Exchange

Notes: 1. Growth rate =  $\frac{1993 - 1996 \text{ growth rates of foreign currency liabilities}}{1990 - 1993 \text{ growth rates of foreign currency liabilities}}$

2. Capital ratio =  $\frac{\text{Capital Stock}}{\text{Total Assets}}$ , Net worth ratio =  $\frac{\text{Shareholders' equities}}{\text{Total Assets}}$

3. Coefficient is computed by regressing growth rates on each variable

4. Correlation ② and coefficient ② are after excluding Seoul bank.

5. Number in ( ) are standard deviation.

**Table 7.7. Granger Causality Test**

Foreign Currency Reserves of BOK and Liability Capital Flows

1990:1 – 1997:2	F-statistic	Probability
Reserves → Flow	1.74	0.19
Flow → Reserves	0.31	0.87
1994:1 – 1997:2	F-statistic	Probability
Reserves → Flow	2.27	0.19
Flow → Reserves	0.09	0.98

Data Source : Bank of Korea on-line service

Note: 1. Change in foreign currency reserves is used for 'Reserves'

2. For 'Capital flows', sum of debt portfolio net inflows and other investment in the capital account is used.

3. 4 lags are included and quarterly data are used.

## Endnotes

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<sup>1</sup> Shin (1998) provides detailed liberalization measures in this area.

<sup>2</sup> Both Moody's and S&P downgraded the sovereign credit of Korea three times for the one month of 11/26 to 12/25 in 1997.

<sup>3</sup> It is interesting to note that, unlike bank borrowing, equity investment showed positive inflows in December.

<sup>4</sup> See Frankel and Rose (1996) for general evidence that fundamental conflicts emphasized in first generation models are not apparent preceding recent crises.

<sup>5</sup> For a detailed discussion on lack of policy conflict before the crisis in Korea, see Shin and Hahm (1998).

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<sup>6</sup> Eichengreen and Wyplosz (1993) argue that self-fulfilling models offer a better interpretation of the ERM crisis in 1992 compared to first generation models. For the Mexican crisis of 1994, Calvo and Mendoza (1995), Cole and Kehoe (1996) and Sachs et al. (1996) argue for the role of shift in expectations.

<sup>7</sup>The two-objective/one policy tool problem is well known. Wigmore (1987), for example, argues that the choice of the new Federal Reserve system to protect its gold reserves in order to maintain the fixed exchange rate forced them to accept the bank failures that may have triggered the 1930s' depression. For a discussion of the conflict in the context of currency boards see Caprio et al. (1996).

<sup>8</sup> The mismatch gap is a ratio of the gap between liabilities and assets, both of which are due within a month. The Korean supervisory authority introduced a 10% standard for the gap as a guideline.

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<sup>9</sup> Press Release of Ministry of Finance and Economy, Jan 30, 1995.