

Private Inflows when Crises are Anticipated:
A Case Study of Korea

Michael P. Dooley

University of California, Santa Cruz

Inseok Shin

Korean Development Institute

I. Introduction

The Korean crisis in 1997 illustrated again the fact that large capital inflows can be a mixed blessing. Liberalization of the capital account in Korea was associated with massive private capital inflows totaling about \$120 billion from 1992 through mid 1997. The reversal of these flows in the second half of 1997 and throughout 1998 was even more dramatic and generated a devastating downturn of the economy.

Why did capital inflows following liberalization turn out to be so dangerous? Although the pattern of liberalization, capital inflows and crisis has become familiar, the underlying mechanism among the three events is not fully understood. An often-raised argument is that macroeconomic risk associated with exchange rate misalignment is the fundamental cause of crises (E.g. Krugman 1979). But the Korean case adds one more counter-example against the argument along with the ERM crisis in 1992 and the Mexican crisis in 1994. In all these cases the external imbalance of the economy before the crisis was hardly alarming (e.g. Dooley and Chinn 1998, Shin and Hahm 1998).

Recently, Dooley (1998) puts forward the insurance model as an alternative explanation for the mechanics behind massive capital inflows and crisis. 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 rest of the paper is structured as follows. In section II, first, we briefly investigate the nature of the Korean crisis by providing background information on capital flows in 90's up to the crisis. We argue that the crisis was a banking panic driven by foreign creditors. In section III, we discuss three frameworks for crises and identify the insurance model as the most suitable general framework 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.

II. Nature of the Korean Crisis: Bank Run Preceded by Private Capital Inflows

II.1 Capital Inflows to Korea in 90's

Background: Policy Stance and Capital Flows in 80's

Prior to the 1990s, Korea's policies on capital account liberalization were pursued in a passive manner and in largely in relation to the developments in the external current account (Figure 1). The exchange rate was rigidly managed and not allowed to respond to capital flows. As a result, burden of financing current account deficits (surplus) assigned to direct, quantitative controls over flows. For example, in the first half of the 1980s when 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 2).

However, 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 direct capital control in an effort to manage the overall external balance. Commercial loans by domestic firms, with the exception of public enterprises, were prohibited. The overseas issuance of bonds and depository receipts (DR) 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, in tandem with the remarkable economic growth for decades, general demand for market liberalization and opening became greater. Market reform and

globalization became key words in policy agenda, upon which capital account liberalization was considered in its own right for the first time. In fact, the Y.S. Kim administration declared “se-gye-wha”(globalization) as the top policy priority. Besides, 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 in January 1992 by opening the Korean stock market to foreign investors for the first time. For capital flows involving debt instruments, liberalization measures were taken as well over the time. Commercial loans by domestic firms, which had been prohibited since 1986, were allowed in 1995.

Overseas issuance by domestic firms of foreign currency denominated bonds was deregulated in 1991. However, though the policy stance has been set to liberalize capital 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 quantity control. 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 without additional discretionary control throughout 90's.¹

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 was not binding or restrictive (at least) since mid-nineties judging from rapid increase in capital inflows channeled through banks.

Capital Inflows in 90's

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 of from 1994 to 1996, the size of inflows more than doubled to 3.5 % of GDP on average (Figure 2).

Increased capital inflows for the three years displayed two salient features. First, debt instruments were the dominant vehicle for capital transactions. Debt instruments accounted for the bulk of total foreign portfolio investment (Figures 2 and 3). Stock investment by foreigners explains only the limited portion of capital inflows, which seems to be a reflection of quantity restrictions mentioned above. Debt contracts and debt portfolios were the major carriers of capital inflows. Consequently, the surge in net capital inflows was tantamount to a sharp increase in Korea's external debts (Figure 4). Second, the major portion of the increase in external debt involved the banking sector (Table 1). Out of the total increase in external

¹ Shin (1998) provides detailed liberalization measures in this area.

debts during the three years, the banking sector explains about 70%. The remaining 30% reflects growth of the corporate sector's external debts, related with trade financing. In addition the total foreign currency liabilities of banks were much larger than their external debts. As part of liberalization measures, banks were allowed to open and expand operations of overseas branches. Banks exploited this opportunity in increasing foreign currency denominated business as aggressively as through domestic branches, leading to large foreign currency liabilities of overseas branches comparable to external debts of domestic branches (Table 2).

II.2 Nature of the Korean Crisis: Pattern of Capital Outflows in 1997

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 5, documents, foreign creditors ran to 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.

As far as based on the capital account balance, the amount of foreign currency borrowings that creditors refused to refinance in November may appear too small to justify the word "run." However, actual magnitude of creditors' run in November was much larger than suggested by the capital account balance for two reasons. First, banks repaid some of debts by "fire-selling" their external assets, which reduced the stock of deposits to be rolled over. Second and more important, the larger portion of run was targeted at overseas branches of the Korean banks, a run not captured in the capital account balance because the BOK replaced these deposits.

Although official data on creditors' run in November are not available, it is possible to estimate the magnitude of private withdrawals. As run occurred, the Bank of Korea acted as the lender of last resort and provided foreign currency liquidity to troubled banks by increasing BOK's foreign currency deposits in those banks. Taking the increase in BOK's deposits as an indicator for the size of run, we note that it reached astounding U.S.\$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 BOK (Table 3).

Banking Panic in December

The Korean government announced its plan to resort to the IMF rescue loans on 21st of November. However, apparently it failed to calm down foreign creditors and severity of run intensified. According to unofficial data of BOK, rollover of credits by foreign banks for the 7 largest Korean banks continued to decline in December (Table 4). This was probably related to a cascade of bad information on the size of short-term external debts of Korea relative to foreign exchange reserves, as well as Moody's and S&P's downward adjustment of the sovereign credit of Korea.² The run that began in November was followed by a typical banking system panic.³

² Both Moody's and S&P down-graded the sovereign credit of Korea three times for the one month of from 11/26 to 12/25 in 1997.

³ It is interesting to note that unlike bank borrowings stock investment capital showed positive inflows in December.

III. A General Framework For the Korean Crisis

Deficiency of Currency Attack Models

Albeit brief, the description of the Korean crisis in the previous section suggests a familiar pattern of private capital inflows, run and crisis. There are at least three analytic frameworks that might help us understand the mechanics underlying the pattern.

The first is the macro-fundamental model or the first generation model of speculative attacks to 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.⁴ 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.

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

In fact, lack of policy conflicts and prior capital inflows - these stylized facts in recent crises are repeated in the Korean case as well, which suggest the irrelevancy of the first generation model for the Korean crisis.⁵

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.⁶ But, they do not seem to provide a convincing story for the events in Asia of 1997 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

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

⁶ 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.

attacks to financial intermediaries that may not be related to exchange rate risk are simply beyond their focus.

Alternative Framework: Insurance Attacks

Dooley (1997) 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 constitutes 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 distinctive 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 from that date forward their yields 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.

Besides, 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.⁷ 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.

In the insurance model, association of currency crises with banking crises is natural in consistent with these empirical findings and the Korean crisis as well.

IV. Private Inflows Motivated by Insurance Fund: a Case of Korea

Specifying Pre-conditions for Insurance Attack in Korea

The model set out in Dooley (1998) is a very stylized model of bank behavior. Therefore, 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 crisis should be prevalent, which is not exactly the case in advanced economies. Thus, in the literature, checking mechanisms are subsequently sought and the following three factors are

⁷ 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).

presented: 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 fund.

We will examine whether and how these conditions were satisfied in Korea before the crisis.

Declines in Franchise Values of Korean Banks in 90's

Throughout 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 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 shows, banks were replacing cash, call loans and deposits with securities in their asset portfolios. Since securities are exposed to price changes, it 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 portion of credits without collateral was rising (Figure 8). Secondly, the portion of consumer loans was expanding in the composition of total loans by

type (Figure 9). Third, in 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 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 risk associated with foreign currency denominated operation. By regulation, Korean banks were not allowed to take net open currency positions exceeding certain limits and thus protected from currency risk. But, maturity mismatches between assets and liabilities in foreign currencies was serious. Measuring the severity of mismatch problem by one-month mismatch gap, as of early 1997 seven largest bank were taking large foreign currency liquidity risks (Table 5).⁸ Hence, declines in franchise values of banks and increase in risk of asset structure was emerging as a characterizing feature of Korean banks in 90's.

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 of from 1992 to 1996 banks' assets more than doubled. Considering that annual inflation rates had been moderate at 5.3% on average, it was remarkable growth in real terms.

Moreover, the growth was achieved while corresponding increase in capital was absent, leading to decline of capital asset ratios (Figure 11). Apparently, the vicious cycle of declines

⁸ 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 10% standard for the gap as a guideline.

in franchise values and increase in bank failure risks was being formed. In fact, in the presence of 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).

Hence, what remains to be explained are why other stake-holders like 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?

During the growth of the three years, assets in foreign currencies had always been important. As Figure 12 shows, more than half of the assets of the banks has been in foreign currencies since 1988. Since the Korean banks has not been allowed to hold net open foreign currency positions, it means that foreign creditors had supported the growth of banking assets by supplying corresponding credits. Thus, rapid expansion of banking assets for the three years before the crisis was matched by as much increase in external liabilities of the banks, which was reflected in massive capital inflows as outlined in Section 2.

Given that Korean banks' incentives to exploit profit opportunities can be justified by moral hazard, what were the foreign creditors' incentives? More specifically, were their lending behavior based on banks' creditworthiness? We attempt to answer the question based on a test case of the Korea First Bank and a brief empirical examination.

Figure 13 shows trends in foreign currency liabilities of the six largest private commercial banks and various bank performance variables. First of all, Figure 13 shows that 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 that there should be a regime change in 1994.

While faster growth than previous years is common to all of six banks, we are particularly interested in two banks - the Korea First Bank and Seoul Bank. This is so because they were the most troubled banks during the crisis development. Capital of both banks was found completely eroded and so the government was forced to intervene in December in 1997. Although both banks were industry under-performers even before the crisis, in foreign currency liabilities they displayed quite contrasting trends. The Korea First Bank recorded the highest growth rate, but Seoul Bank the lowest with considerable margin. But, we do not believe that 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. Although there were much too be desired in supervision as will be discussed later, 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, after taking into the account this informal information, we argue that the Korea First Bank should be focused on as a valid test case for foreign creditors' behavior and that foreign creditors' lending policy was hard to be seen as 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 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 result can be summarized as follows. When Seoul Bank is included, the growth rate of foreign currency liabilities does not show 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 evidences are against that foreign creditors lend on creditworthiness of individual banks.

Insurance Fund and Capital Inflows

The fact that foreign creditors were not looking at status of individual banks strongly suggests that their lending decisions should be rather on the insurance fund, namely ability of the government to fulfill its implicit guarantees on 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). The result shows that, if any, causality runs from changes in reserves to capital flows.

IV.1 Caveats in Regulation and Supervision: How Were They Created?

Given the fact that capital asset ratio was declining, it goes without saying that 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 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 2). However, Shin and Hahm (1998) explain why the numbers are disguising the true state. 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 shows that both of them were prevalent in Korea before the crisis.

In fact, judging from the advanced standard it is too evident that there were much to be desired with regulation and supervision. Therefore, what intrigues us here is why regulators let the sorry state continue and the banks expand. In other words, what is more important seems to understand how and why regulatory authorities failed to maintain stability of the system.

To better understand failures of banking supervision in Korea, we must look first 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. And there 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 operation 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, essentially yielded the state that microeconomic risk management of financial market agents was muted while macroeconomic risk management was practically the only mechanism controlling financial risks in the economy. Specifically under the policy setting, the government set the targets for aggregate monetary variables such as money growth rates, inflation rates, exchange rates and interest rates. And then the government utilizes all the available intervention tools to achieve the targets.

Whatever the costs of efficiency are, the policy mechanism worked well enough to attain macroeconomic stability of the Korean economy for decades. Therefore, in spite of the environmental change resulted from capital account liberalization, the government did not lost belief in direct control on financial flows and was confident in maintaining financial stability.

Hence microeconomic manipulations for macroeconomic targets continued. One interesting case is direct quantity control on stock issues of banks. In order to ‘stabilize’ the stock market the government kept controlling new stock issues of banks and in 1995 permitted only 30% of the amount originally planned by banks.⁹ That is, the problem of capital shortage of banks was not only known to the government but also even aggravated—a good example illustrating the government’s belief that macroeconomic stability could be obtained through the old way of going about the business.

⁹ Press Release of Ministry of Finance and Economy, Jan 30, 1995.

It seems that to the last minute of 1997 the government succeeded in maintaining macroeconomic stability as desired. Inflation rates were low ever and fiscal account was balanced. Besides, M2 growth rates seemed to be stable.

Then, 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 aforementioned, 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 by definition, 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 risks by enabling banks to exploit implicit insurance.

V. Discussion and Lessons

Deja-Vu Story?

In retrospect, one cannot but wonder whether there was anything new in essence in the Korean crisis. In the presence of implicit or explicit deposit insurance, there are numerous examples that incentives of banks to exploit it due to environmental changes like liberalization resulted in crises.

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, it 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 bail out of depositors as a time consistent equilibrium. Therefore, unless one can figure out elaborate institutional settings which will support no bail-out 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.

The argument is close to the spirit of that offered by Dias Alejandro (1985). Although he emphasized the role of deposit insurance in generating crises in Southern Cone he makes the

much more general point that banks customers are also implicitly guaranteed.
“Southern Cone domestic financial systems of the late 1970s and early 1980s ended up with a pessimism “middle way”: defacto public guarantees to depositors, lenders and borrowers, and no effective supervision and control (until it was too late) of the practices of financial intermediaries...as illustrated in the recent Chilean experience, foreign financial agents will not accept a separation of private and public debts when a crisis arrives.”

Reference

Calvo, G. (1995). "Varieties of capital-market crises," Working Paper, University of Maryland.

Calvo, G. (1996). "Capital flows and macroeconomic management: tequila lessons," unpublished manuscript, University of Maryland .

Calvo, G. and Mendoza, E. (1995). "Reflections on Mexico's balance-of-payments crisis: a chronicle of death foretold," unpublished manuscript, University of Maryland.

Caprio, G., Dooley M., Leipziger, D. and Walsh, C. (1996). "The lender of last resort function under a currency board: the case of Argentina." *Open Economies Review*, vol 7, pp. 625-650.

Cole, H. and Kehoe, T. (1996). "A self-fulfilling model of Mexico's 1994-5 debt crisis," Federal Reserve Bank of Minneapolis, Staff Report 210.

Dooley, Michael P. (1997). "Governments' Debt and Asset Management and Financial Crises: Sellers Beware," Presented at the Public Management Seminar, Banco Central do Brasil, Rio de Janeiro, August 1, 1997.

Dooley, M. (1996b). "The Tobin Tax: good theory, weak evidence, questionable policy." In *The Tobin Tax: Coping with Financial Volatility* (ed. M Ul Haq, I. Kaul and I. Grunberg), pp. 83-108. New York: NY: Oxford University Press.

Dornbusch, R. (1997). "Brazil's incomplete stabilization and reform." *Brookings Papers on Economic Activity*, vol 1, pp. 367-404.

Eichengreen, B., Rose, A. and Wyplosz, C. (1996a). "Contagious currency crises," NBER Working Paper, No. 5681, National Bureau of Economic Reserach.

Eichengreen, B., Rose, A. and Wyplosz, C. (1996b). "Speculative attacks: fundamentals and self-fulfilling prophecies," NBER Working Paper, No. 5789, National Bureau of Economic Research.

Eichengreen, Barry and Charles Wyplosz (1993). "The Unstable EMS," *Brookings Papers on Economic Activity*, (Washington: The Brookings Institution).

Flood, Robert P. and Peter M. Garber (1984). "Gold Monetization and Gold Discipline," *Journal of Political Economy* 92: 90-107.

Frankel, J. and Rose, A. (1996). "Currency crashes in emerging markets: an empirical treatment." Board of Governors of the Federal Reserve System, IFDP 534, (January).

Garber, Peter (1996). "Comment," *NBER Macroeconomics Annual 1996*, Vol. 11, pp. 403-406.

Gavin, M. and Hausman, R. (1995). "The roots of banking crises: the macroeconomic context." Mimeo, Interamerican Development Bank.

Goldfajn, I. and Valdes, R. (1997). "Balance of payments crises and capital flows: the role of liquidity." unpublished manuscript, MIT.

Kaminsky, G. and Reinhart, C. (1996). "The twin crises: the causes of banking and balance-of-payments problems." International Finance Discussion Paper No. 544, Board of Governors of the Federal Reserve (March).

Krugman, P. (1979). "A model of balance-of-payments crises." *Journal of Money, Credit, and Banking*, vol. 11, no. 3, pp. 311-325.

Krugman, P. (1996). "Are currency crises self-fulfilling?" *NBER Macroeconomics Annual*, Vol.11, pp. 345-378.

Lane, Timothy and Liliana Rojas-Suarez (1992). "Credibility, Capital Controls, and the EMS," *Journal of International Economics* 32: 321-337.

Obstfeld, Maurice (1994). "The Logic of Currency Crises," *NBER Working Paper #4640* (Cambridge, Massachusetts: National Bureau of Economic Research).

Obstfeld, M. (1986). "Rational and self-fulfilling balance-of-payments crises." *American Economic Review*, vol. 76, p. 72-81.

Sachs, J., Tornell, A. and Velasco, A. (1996). "Financial crises in emerging markets: the lessons from 1995." *Brookings Papers on Economic Activity*, No. 16, pp.147-215.

Table 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 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 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 4. Rollover Rates of Seven Largest Banks
(Unit : %)

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

Table 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 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 Coefficient		0.7479 0.13 (0.28)	0.2411 0.522 (3.48)	-0.224 -0.0001 (0.0003)	-0.6298 -2.96 (1.82)	-0.2592 -0.41 (0.77)
Correlation ^② Coefficient ^②		-0.8255 -6.91 (2.73)	-0.8668 -0.81 (0.27)	-0.7051 -0.0003 (0.0002)	-0.1542 -1.41 (5.19)	-0.4697 -0.58 (0.63)

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

Note : 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. 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.

Figure 1. Trends of Exchange Rate and Current Account Balance

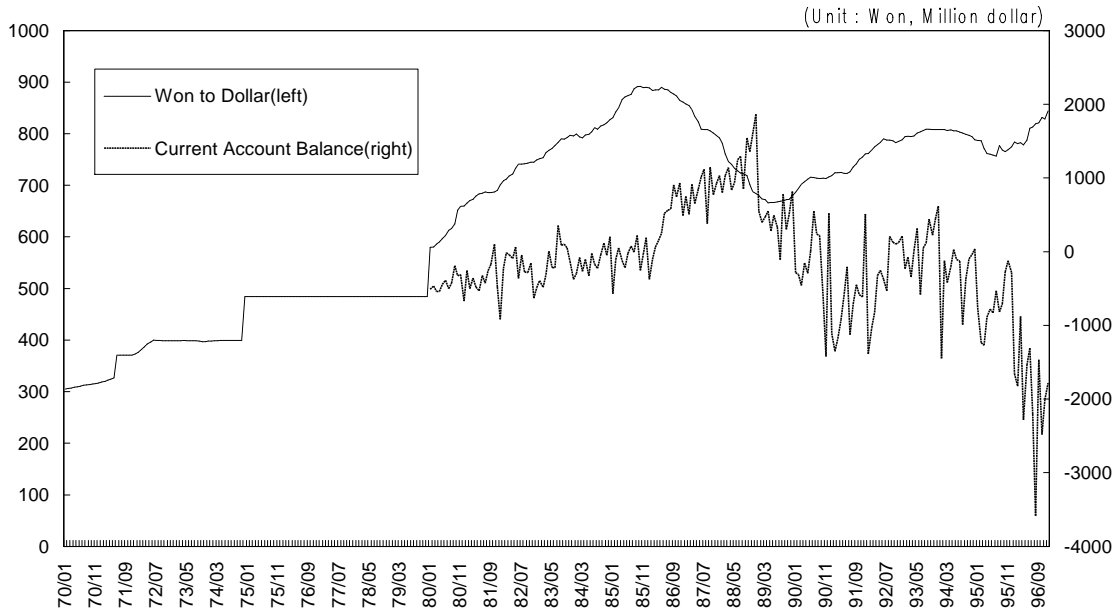


Figure 2. Trends and Composition of Net Capital Inflows to Korea

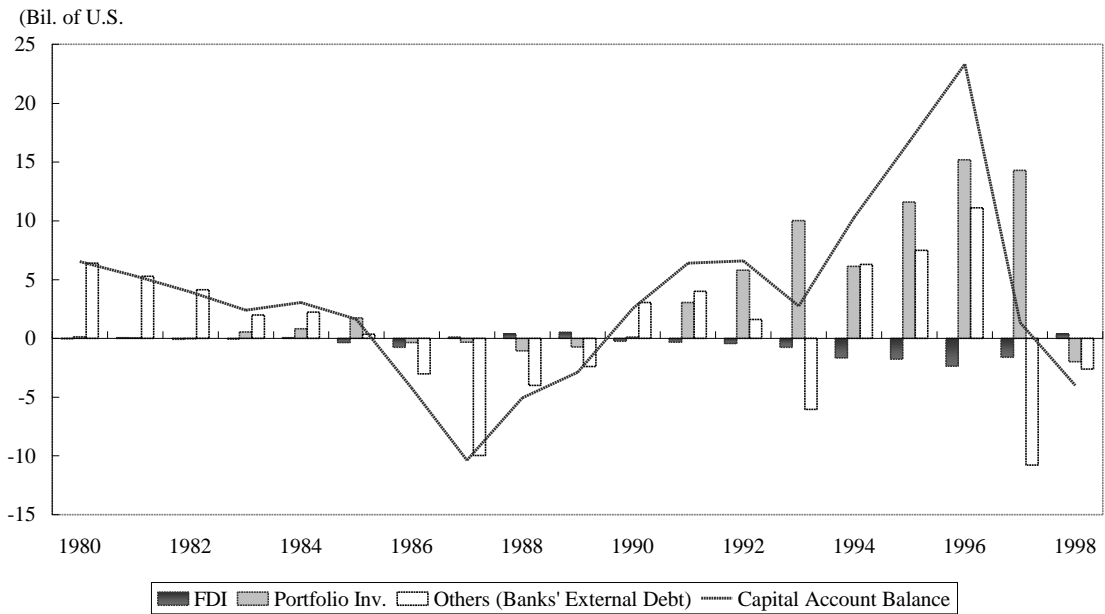


Figure 3. Composition of Portfolio Investment

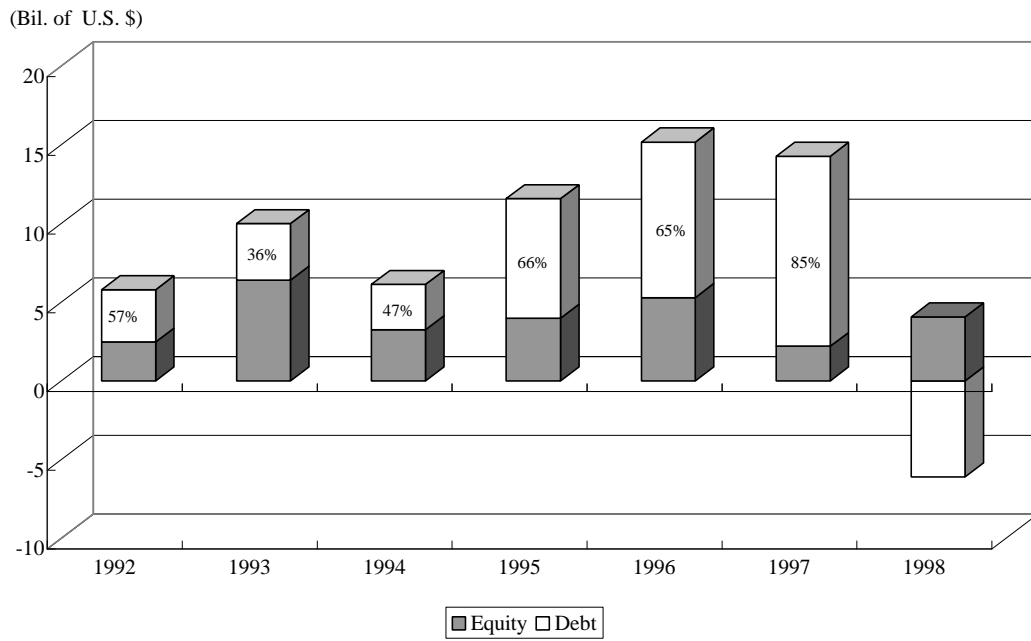


Figure 4. Trend and Composition of External Debt

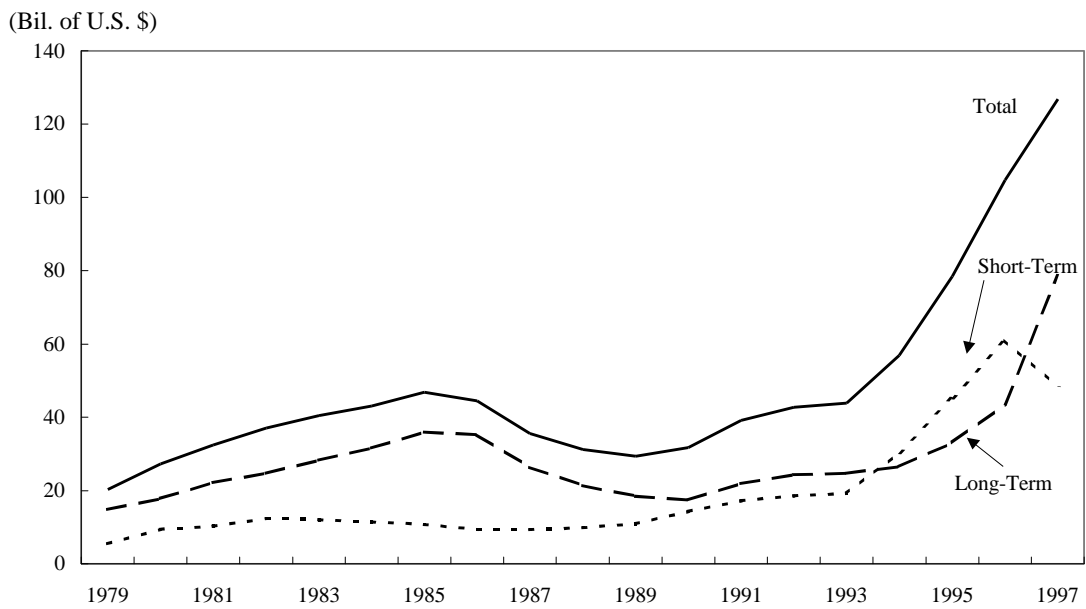


Figure 5. Capital Flows in 1997

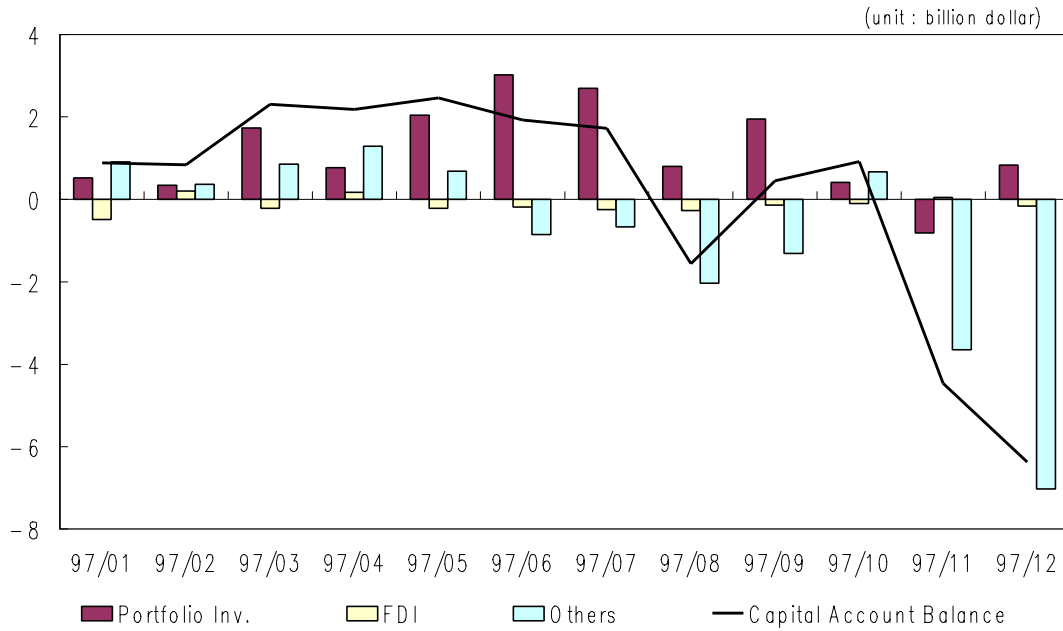


Figure 6. Stock Market Performance of the Korean Banks

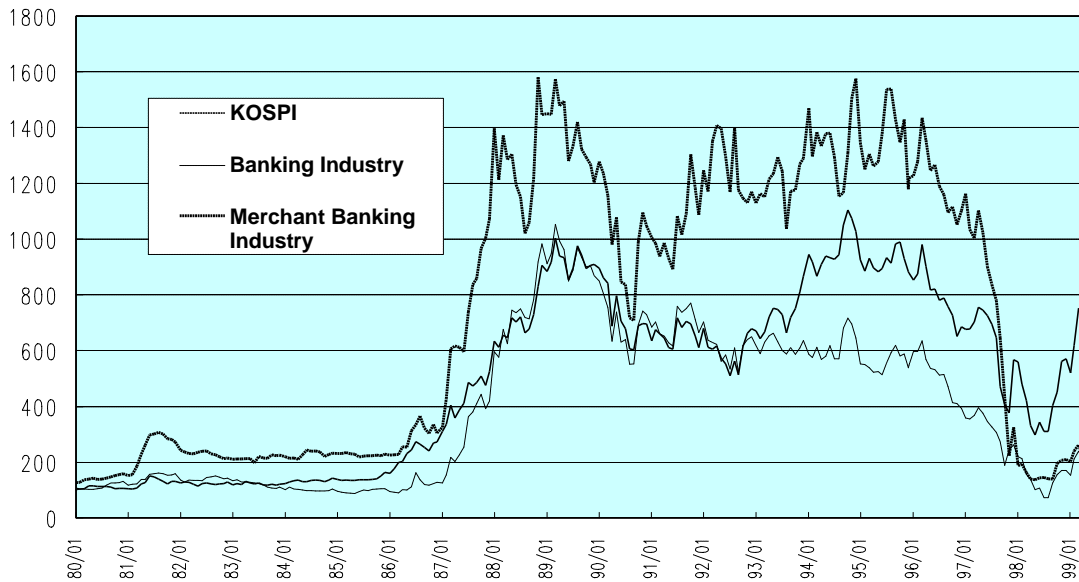


Figure 7. Composition of Total Assets: By Type

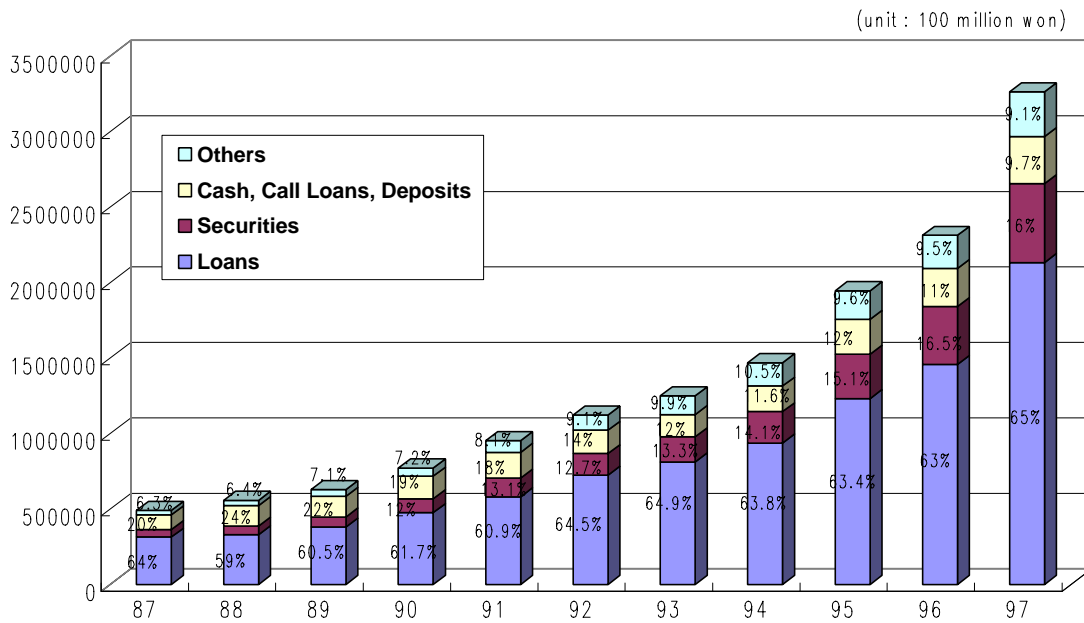


Figure 8. Composition of Total Credit: By Type of Collateral

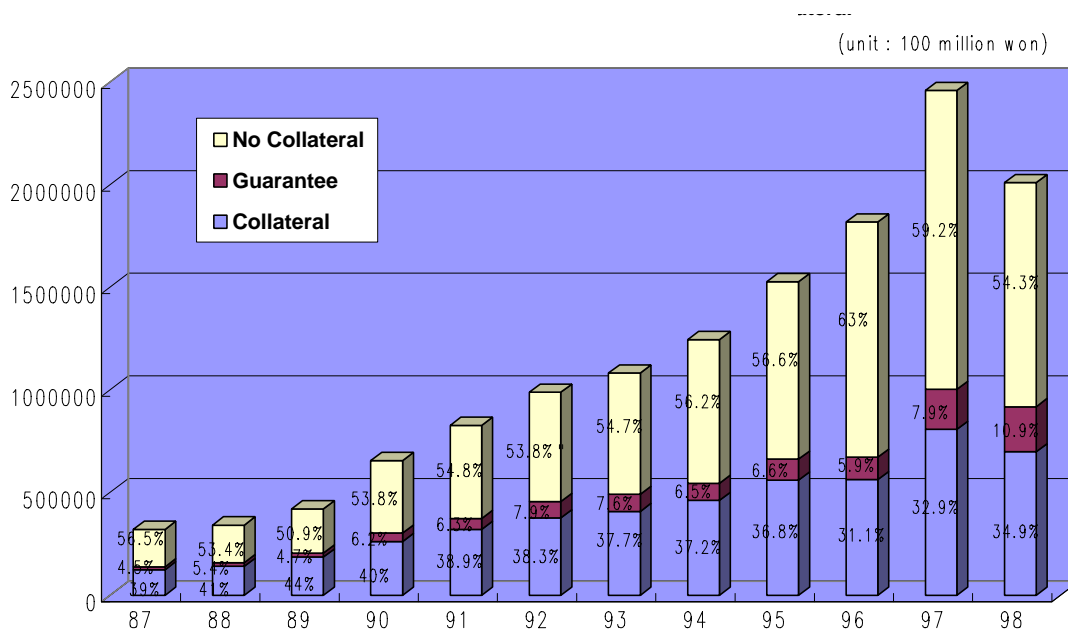


Figure 9. Composition of Total Loans: By Type

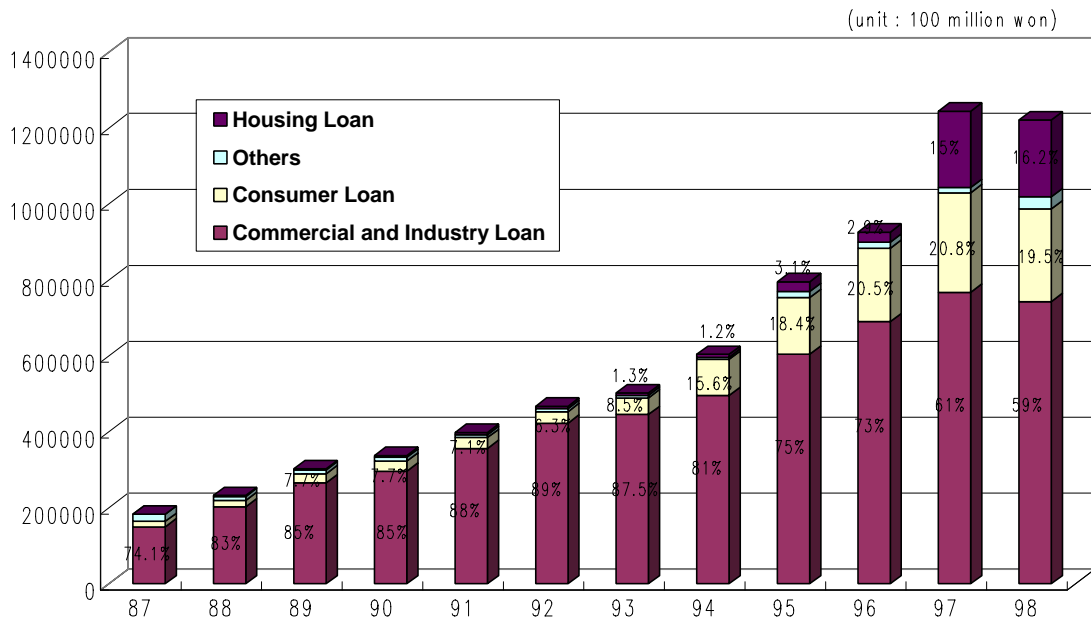


Figure 10. Composition of Commercial and Industrial Loans: By Firm Size

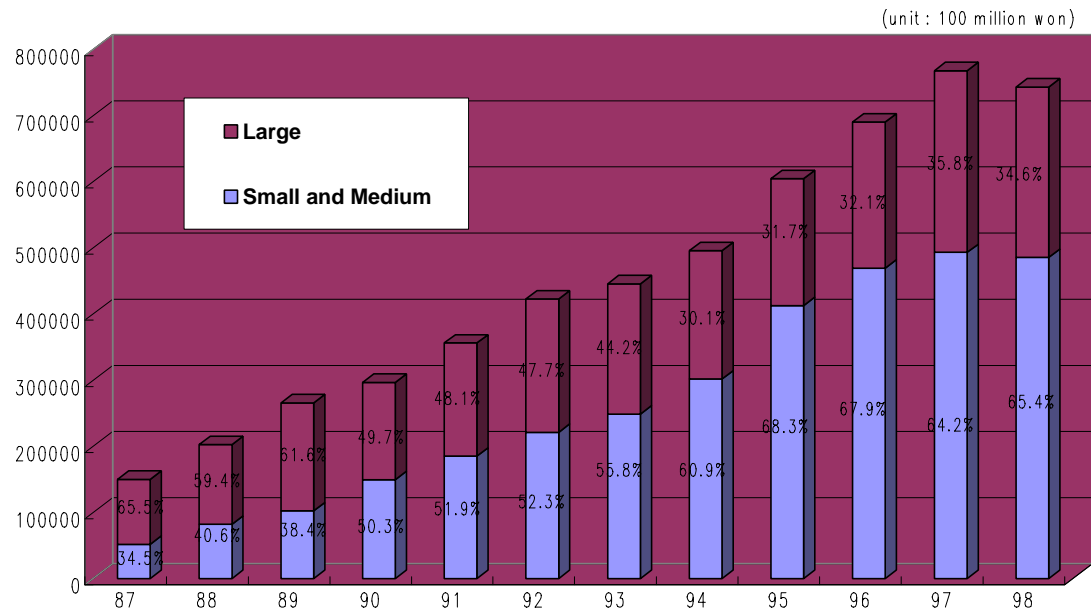


Figure 11. Capital Asset Ratio

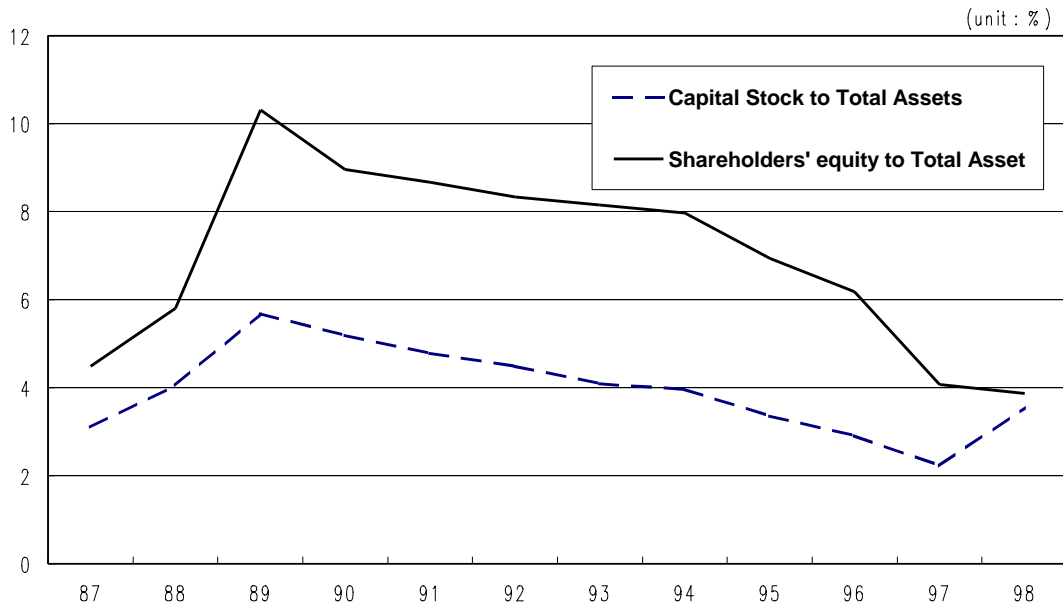


Figure 12. Composition of Total Assets: By Currency

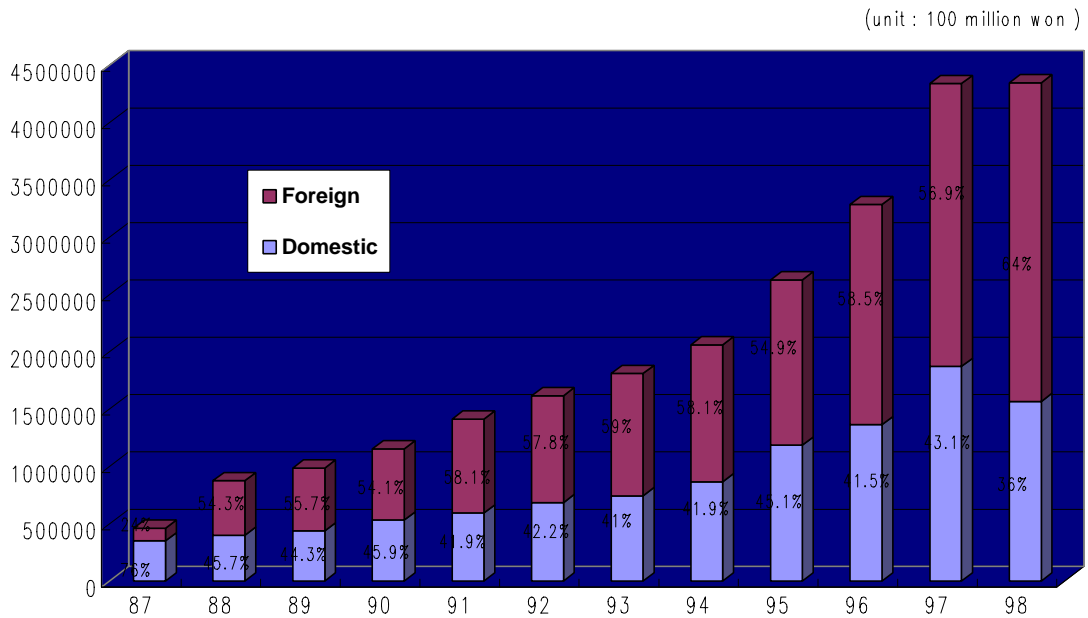


Figure 13. Growth of Foreign Currency Liabilities of Korean Banks

