

Opening to Capital Flows and Implications from Korea*

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Abstract

Recent capital flow episodes in Korea and the effectiveness of policy responses to such capital flows are discussed. Capital account liberalization has strengthened the linkage between capital flows and financial market variables even in the short-term perspective. This paper demonstrates that some capital flows in the form of investment in bonds are driven by derivative-related trades. Furthermore, capital inflows respond to domestic financial variables more sensitively when those variables exhibit high volatility. The effectiveness of various policy measures has been at least partially constrained. Even monetary policy does not seem an exception, as transmission mechanism is significantly influenced by capital flows. As seen recently in the process of international financial unrest propagation, despite the health of Korea's economic fundamentals, volatility in capital flows has sharply increased.

What have we learned from these experiences? First, once the capital account is liberalized, existence of a sound market structure is an absolute necessity. In Korea, despite of recent capital flow reversals, the collateral benefits from financial integration such as institutional development, financial market development and improved governance has helped to mitigate the expansion of financial system instability. Second, prudential regulation and supervision of banks' external borrowing, especially short term, need to be further strengthened. Last but not least, capital flows such as equity investment and FDI, that are less sensitive to macro variables than debt and borrowings, can prove to be more stable sources of foreign capital. In that regard, an economic environment more suitable to attracting FDI is crucial for dealing with capital flows.

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I. Introduction

Capital flows into emerging market economies bring both benefits and risks. Capital inflows can have a number of important benefits: acceleration of economic growth and reduction in consumption volatility through the increase in investment resources and cuts in capital costs. Empirical evidence suggests that many countries that are open to capital flows can enjoy many of these benefits. Recently, international economists have paid attention to the benefits realized through indirect channels, such as improvements in the governance structures of financial institutions and acceleration of financial market development. These are the so-called collateral benefits, which may be more important in increasing economic growth and productivity, and in reducing the risks of crisis once threshold conditions are met.¹⁾

Capital inflows, however, can also have risks, in the sense that they can lead to increased economic volatility through contagion effects from external shocks, and they can possibly diminish the degree of effectiveness of domestic policy tools and measures. In addition, capital inflows can boost the likelihood of a financial crisis due to a sudden reversal of capital flows.²⁾ Many emerging countries that reduced barriers to capital account transactions experienced large swings in capital inflows and subsequently experienced economic crisis.

This paper attempts to present risks inherent in large capital flows, and to assess the effectiveness of policy responses to international flows based on recent experience in Korea. After the East Asian crisis in 1997, Korea switched from a managed-floating to a free-floating exchange rate system, by eliminating the daily exchange rate fluctuation band, and expanded capital liberalization as well by easing or abolishing many restrictions on cross border capital flows.

Many efforts have been devoted in Korea to accommodate financial globalization, among them replacement of economic regulations by prudential regulation and supervision, development of financial markets and improvement of corporate governance. Especially, Korea's adoption of an inflation targeting monetary policy regime has been a catalyst to a well-functioning financial market, as a result now equipped with greater depth and characterized by enhanced discipline.

After the crisis, as both the current and capital accounts posted continuing

1) The related issues may be best found in Kose et al. (2006).

2) To our knowledge, Prasad and Rajan (2008) have updated most recent issues related to capital account liberalization. Kawai and Lamberte (2008) have discussed policy issues in Asian countries.

surpluses, oversupply in the foreign exchange market intensified, leading to a substantial increase in foreign reserves and marked appreciation of the Korean Won for a prolonged period. Since the second half of 2007, however, foreign portfolio investment has shifted to large scale net outflows as international financial market unrest has spread.

Capital flows have led financial market variables such as interest rates, stock prices and exchange rates to show heightened volatility. In response, the policy authorities have taken various policy measures in attempts to mitigate the negative effects of large capital flow swings. Some measures, as we will see later, were intended to affect capital inflows and outflows directly. Arguably, however, it seems that they have not been sufficiently effective, and have sometimes brought about unexpected side effects. The effectiveness of policy measures has been at least partially constrained because the progress of capital liberalization and expansion of the financial derivatives market have strengthened the linkage between domestic and international financial markets. Even monetary policy, which has been conducted with more of a focus on domestic economic developments, does not seem an exception since the transmission mechanism is significantly influenced by capital flows.

Korea's experiences tell us that economic policies such as implementing monetary and financial stability, maintaining sound public finance, and managing external debt should be conducted in accordance with capital market integration. As is often pointed out, once capital flows swing on a large scale, it is difficult to absorb the resultant shocks.³⁾

This paper attempts to examine the characteristics of increased capital flows due to capital liberalization, as well as the policy responses in Korea since the currency crisis, and derive some implications. Section 2 explains the background of the paper: the process of capital liberalization, the opening of financial markets and industry, conduct of inflation targeting monetary policy, etc. Section 3 outlines the major characteristics of capital inflows to and outflows from Korea since the currency crisis. Section 4 probes the policy measures and their effectiveness, centering on recent episodes. Lastly, Section 5 closes the paper with concluding remarks.

3) Kaminsky and Reinhart (2004), for example.

II. Capital Account and Financial Market Liberalization: Background of the Paper

1. Capital account liberalization

Immediately after the East Asian crisis in November 1997, the Korean government fully liberalized capital inflows including foreign investment in the short-term money market. In April 1999, the bona fide principle for foreign exchange transaction authorization, maintained for over 50 years, was abolished. Most regulations on capital account transactions by domestic firms were lifted, so that corporations and financial institutions were able to either borrow or issue short-term bonds overseas.⁴⁾ Non-residents were also allowed to make deposits and open accounts denominated in Korean won.⁵⁾ In January 2001, OTC securities transactions between residents and non-residents were liberalized.

Later, as the Korean economy continued to record current account surpluses, capital outflows were encouraged. In January 2006, the ceiling on overseas financial or insurance business investment by domestic non-financial institutions was abolished, and the limits on real estate acquisition abroad and overseas direct investment by individuals were expanded. In January 2007, the ceiling on residents' acquisition of overseas real estate was adjusted upward, while the limit on eligibility of securities as objects of overseas direct investment was abolished.

4) After joining the global anti-money laundering efforts, however, the Korean government established the Korea Financial Intelligence Unit (FIU) in November 2001, and financial institutions are required to report transactions suspected of connection with criminal proceeds laundering to the FIU.

5) However, won funding by non-residents is regulated, while the ceiling on won-denominated loans has been raised. The threshold amount subject to prior reporting to the BOK is currently 30 billion won (about 23 million USD).

Table 1		Korean Capital Account Liberalization	
Dates	Measures		
Dec 1997	Full liberalization of corporate and government bond markets		
Apr 1998	Establishment of foreign subsidiaries allowed		
May 1998	Opening of all money market instruments (CP, CDs, RPs, etc.) Removal of ceilings on foreigners' stock market investment (with exception of investment in some state-owned enterprises)		
Apr 1999	First phase of FOREX liberalization: capital account transaction regulation changed from positive to negative list system		
Jan 2001	Second phase of FOREX liberalization: abolishment of ceilings on overseas payments for overseas expenses for travel, stay, education and emigration		
Dec 2005	Abolition of capital transaction licensing system, replaced by an ex post reporting system		
Jan, Mar 2006	Removal of ceilings on outbound FDI by individuals and of restrictions limiting the types and items of overseas securities investment by individuals		
May 2006	Early implementation of FOREX liberalization plan 1) advancing schedule of plan from 2011 to 2009 2) allowing acquisition of overseas real estate up to US\$1 million		
Jan 2007	Raising of limit on acquisition of overseas real estate by Korean nationals for investment purposes, from US\$1 million to US\$3 million		
Dec 2007	1) full completion of first phase of FOREX liberalization plan, as scheduled 2) abolishment of reporting requirement for capital transactions up to US\$50,000, and reduction of documents required for reporting		

Source: Ministry of Strategy and Finance.

2. Opening of financial markets

In line with the progress of globalization in the international financial environment, the Korean government has opened its financial market to the level of developed countries.

Since the crisis, foreign capital were invited to invest directly in the Korean banking industry, mainly via the methods of acquisition of or equity participation in Korean banks. The Korean government deliberately promoted these arrangements in order to restructure the distressed financial system and banking industry. As a result, foreign ownership in the banking industry rose

Table 2 Opening of Financial Market to Foreign Investors

	Share participation	Establishment		Cross border supply
		local subsidiary	branch	
Banking	Investment less than 50% possible ('82)	100% acquisition possible with approval of FSC ('98.4)	Unlimited ¹⁾	Limited
Securities	Unlimited ¹⁾	Unlimited ¹⁾		Not open
Investment trust				Partially open for mutual fund investment
Insurance				Partially open to reinsurance across borders

Note: 1) Fully liberalized during the period of 1990 to 1998.

Sources: Bank of Korea, Ministry of Strategy and Finance, Financial Supervisory Commission.

rapidly.⁶⁾ In addition, foreign bank branches were endowed the ability to carry out their businesses under conditions almost identical to those facing Korean banks, as preferential treatment were reduced and discriminatory business regulations were lightened.

Table 3 Trend of Foreign Shareholding¹⁾ in Banking Industry

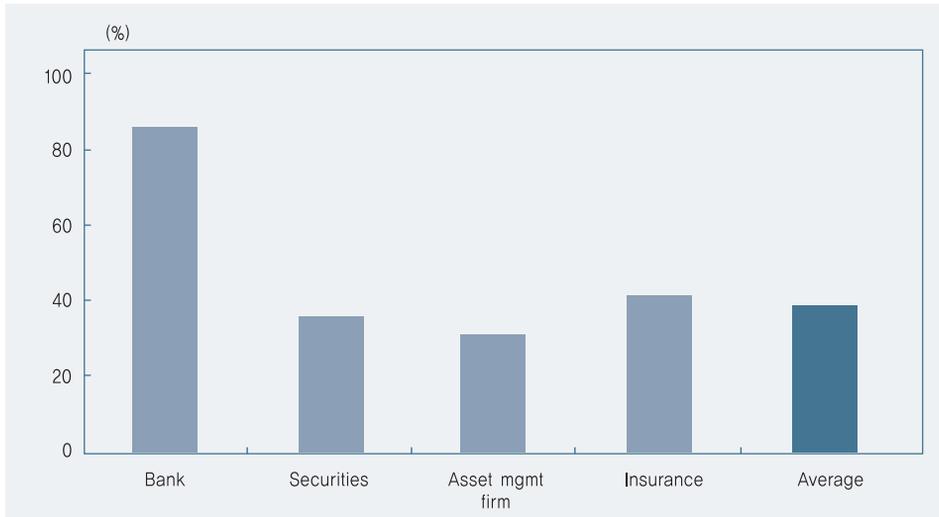
1997	2003	Sep. 2004	Sep. 2007
16.4%	50.2%	59.7%	57.8%

Note: 1) Based on commercial banks, and calculated based on market prices.

Source: Financial Supervisory Service.

In the process of the government's opening of the equity and short-term money markets to foreign investors, while at the same time restructuring insolvent financial institutions, foreign ownership in the domestic capital market also expanded substantially. The percentage of financial firms having more than 50% foreign shareholding amounted to 38% as of the end of 2007.

6) Incidentally, as pointed out by Kim and Oh (2006), when a foreign-owned bank began aggressive lending to households, loans to households by the banking sector as a whole also increased drastically.

Figure 1 Share of Foreign Financial Firms

Note: Based on the number of financial firms having greater than 50% foreign share holding as of the end of 2007.
Source: Financial Supervisory Service.

3. Institutional development

Through integration of four supervisory bodies (the Office of Bank Supervision, Securities Supervisory Board, Insurance Supervisory Board, and Non-bank Supervisory Authority), a single supervisory organization (the Financial Supervisory Service, or FSS) was established on January 2, 1999. The primary function of the FSS is examination and supervision of financial institutions, but its activities can extend to other oversight and enforcement functions as charged by the Financial Services Commission and the Securities and Futures Commission.

In order to tighten the prudential regulation of financial institutions, a prompt corrective action framework was introduced, so that the regulatory authorities could order financial institutions failing to meet certain criteria to replace management, reduce capital, merge, or dispose of certain businesses. The asset quality classification standards of banks, merchant banking corporations, securities companies, asset management companies and insurance companies were also strengthened, so as to take into consideration borrowers' future repayment capacities. Criteria for internal controls and for compliance systems were in addition introduced for financial institutions.

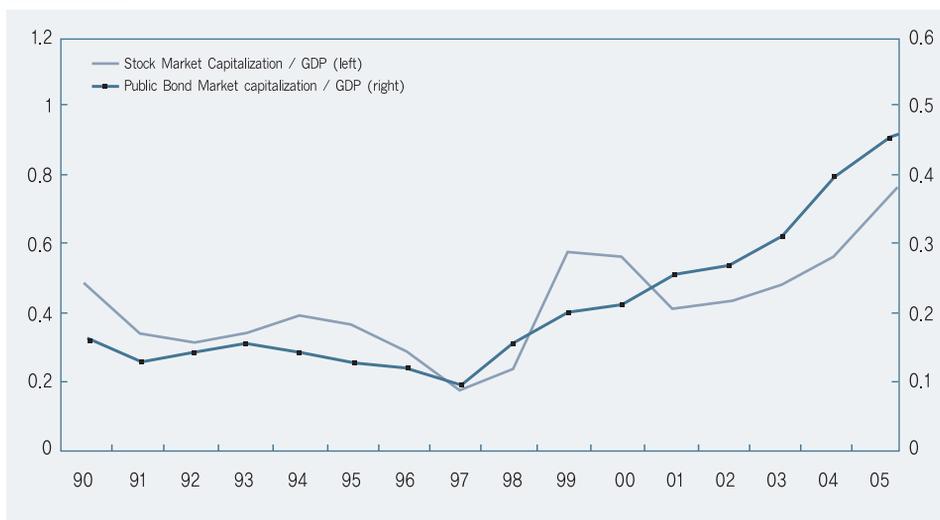
At the same time, efforts were made to strengthen market discipline and enhance the transparency of financial information. Standards for accounting and public disclosure were heightened, to enable shareholders, creditors and others to more accurately gauge a financial institution's management performance from its financial statements. For example, a mark-to-market system for valuation of marketable securities was introduced, and financial institution's financial statements must now be drawn up in accordance with accepted corporate accounting standards.

From the end of 2006, the New Basel Capital Accord was introduced to major banks in Korea. The new Accord involves three pillars: minimum capital requirements (more than 8% of risk-weighted assets), supervisory review of capital adequacy, and market discipline. It is expected to help not only upgrade the level of domestic banking industry risk management, but also increase financial system stability.

4. Financial market deepening

After the currency crisis, the Korean stock and bond markets have grown substantially. Stock market capitalization more than tripled between 2000 and 2005 to reach near 80 percent of GDP in the latter year.⁷⁾ Bond market activity was relatively subdued by comparison, but since 2003 has expanded significantly with the increased reliance on bond market finance by the government and corporations.

7) In September 2008, the FTSE announced that it will grant "developed" status to South Korea, effective from September 2009. Korea had of course already been considered "developed" or "high-income" by other organizations, including the World Bank and the IMF. Recognition by the FTSE is important, however, in that it is a benchmark used to measure risk by many investment and financial groups. The designation should over time therefore lead to increased investment flows into the country, as well as improvement of its international credit rating.

Figure 2 Bond and Stock Market Capitalization in Korea

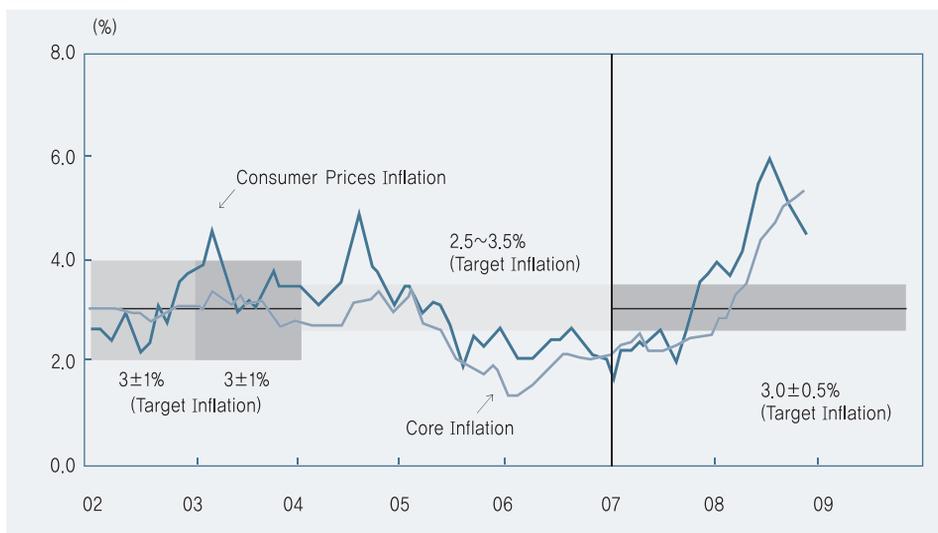
Source: World Bank Financial Development Indicators.

5. Monetary policy framework of the Bank of Korea

In line with the introduction of a floating exchange rate system and widening of financial liberalization after the currency crisis, Korea adopted an inflation targeting (IT) regime as its monetary policy framework, while changing from a monetary aggregate to an interest rate orientation by setting the overnight call rate as the operational target. Under an IT regime, the central bank forecasts the future rate of inflation through use of a wide range of information variables, and operates monetary policy so as to bring the actual inflation rate into convergence with the target figure. The inflation target level is currently $3.0 \pm 0.5\%$ in terms of headline CPI inflation, for the three-year-period from 2007 to 2009.⁸⁾

In March 2008, the Bank of Korea reformed its monetary policy operational framework to resolve drawbacks in the call rate targeting framework. The measures included changing the policy rate from the call rate to the seven-day BOK Base Rate, improvements in the reserve requirement scheme, regularization of open market operations, and introduction of standing facilities.

8) In Korea, headline CPI rose 2.5% in 2007, continuing at the lower bound of its target range. It rose 4.7% during Jan–July 2008, however, exceeding the upper target range bound.

Figure 3 Inflation Target and Actual Inflation

Source: Bank of Korea.

The IT scheme is known to have a number of advantages. Unlike in exchange rate targeting, for instance, the central bank can conduct monetary policy focusing on domestic economic developments, since equilibrium in the foreign exchange market can be achieved as exchange rates adjust flexibly on their own. IT furthermore serves as a useful nominal anchor, which in turn helps to enhance monetary policy transparency and heightens the responsibility of the central bank. Under the IT scheme, BOK's ability to achieve accurate economic and financial forecasts, and the existence of reasonably well-functioning, sound financial markets become more important than ever, to link the central bank instruments to the ultimate policy variable, a measure of inflation.

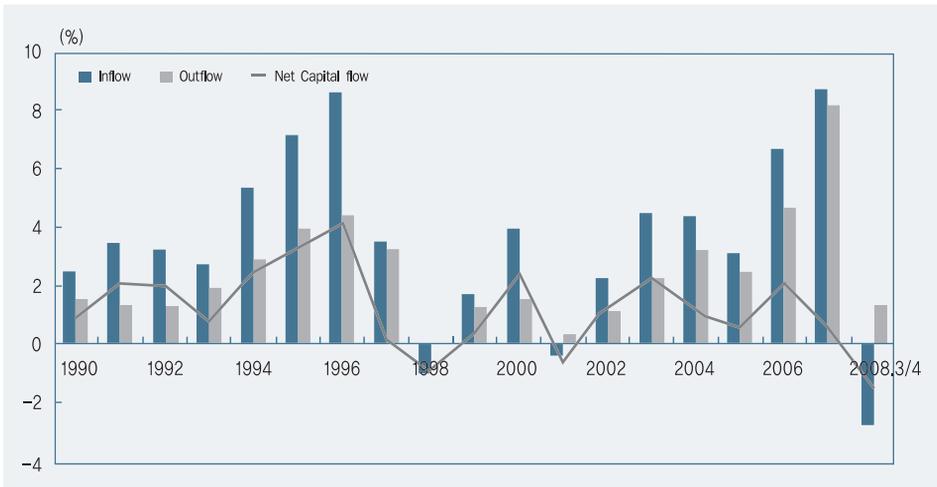
III. Stylized Facts on Capital Flows in Korea

1. Increases in both capital inflows and outflows

Thanks to the progress of capital liberalization and macroeconomic performance, foreign capital inflows into Korea, which had halted during the

currency crisis, have resumed. The scale of aggregate capital inflows, which amounted to 6.1% of nominal GDP in 1996, right before the crisis, declined to the level of 2~4% of GDP during the period 1999 to 2005. However, inflows rose considerably after that – to 6.1% and 7.4% of GDP in 2006 and 2007, respectively. The recent surge in capital flows differs from that leading up to the East Asian crisis, in that a massive increase in capital outflows as well as inflows has occurred. The scale of aggregate capital outflows has increased to 8.4% of GDP in 2007.

Figure 4 Capital Inflows and Outflows Relative to GDP

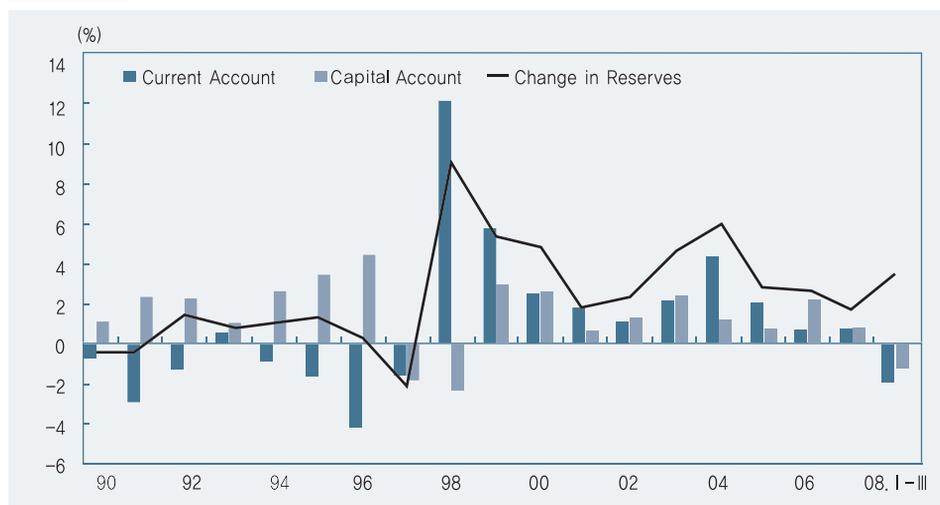


Source: Bank of Korea.

This is attributable to a rise in outbound FDI triggered by the government's capital liberalization measures since 2006, and to a remarkable rise in residents' overseas equity investment, especially in Asian countries. While the capital account registered a surplus of 3.5% of GDP in 1999, right after the crisis, the surplus then narrowed to remain at the 1~2% of GDP level before shifting to a deficit of 0.9% of GDP in 2007. Since the Asian currency crisis, Korea has enjoyed sizable current account surpluses (The current account surplus volumes, however, have steadily narrowed since their peak in 2004, and the current account is expected to reverse into a deficit in 2008). As a consequence of its current and capital account surpluses, Korea has built up a prodigious volume of foreign exchange reserves, which totaled 262 billion

dollars at the end of 2007.

Figure 5 Current and Capital Accounts, and Foreign Reserves Relative to GDP



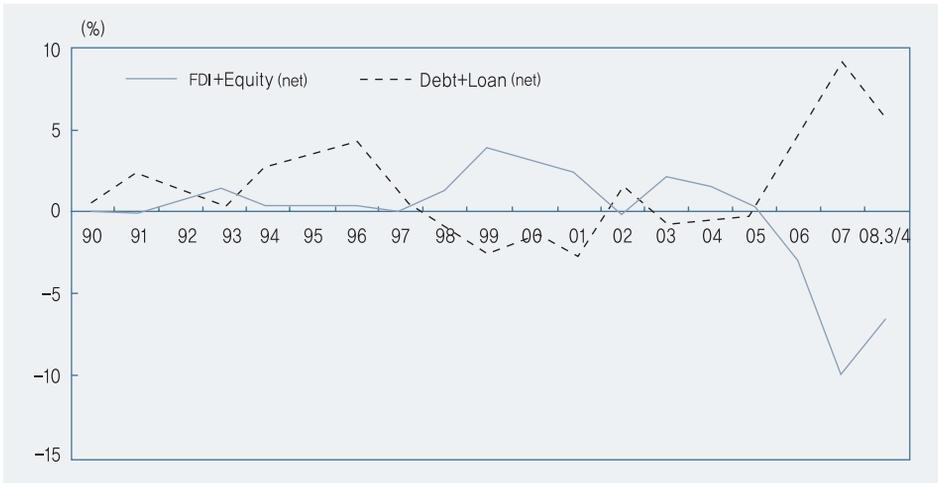
Source: Bank of Korea.

2. Tradeoffs between debt and equity financing

Capital account liberalization appears to have contributed to altering the general composition of capital flows as well as their overall volume. FDI and equity investment combined increased to 5% of GDP in 1999, right after the currency crisis. Their scale has gradually declined since then, however, and shifted to net outflows from 2006. The size of these net outflows grew to near 10% of GDP in 2007, thanks to the government measures to facilitate active overseas investment. In contrast, the combined inflows of debt and bank loans, which surpassed 2% of GDP right before the crisis, afterwards showed continued net outflows or small-scale net inflows for several years. They surged markedly from 2006, however, and approached 9% of GDP in 2007.

Another feature to note is the relationship between capital inflows and domestic investment. Until 2002, capital inflows and domestic investment showed similar movements. Since 2003 their movements have become desynchronized, however. Domestic investment has been sluggish despite the increase in foreign capital inflows. This is partly due to the fact that the composition of capital inflows has been altered to a prevalence of portfolio

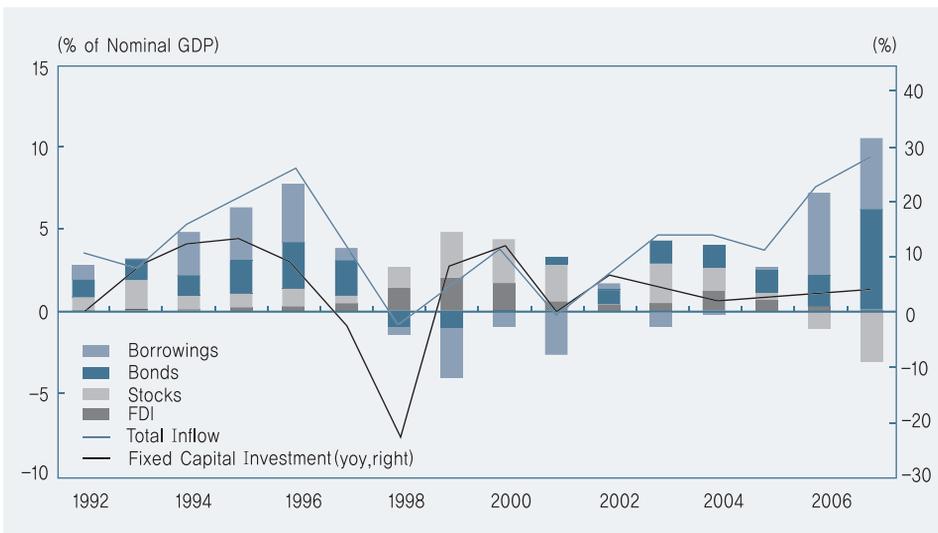
Figure 6 Debt and Equity Flows Relative to GDP



Source: Bank of Korea.

(mainly equity) investment and borrowings over FDI, which may have a stronger link with domestic investment.

Figure 7 Capital Inflows and Investment



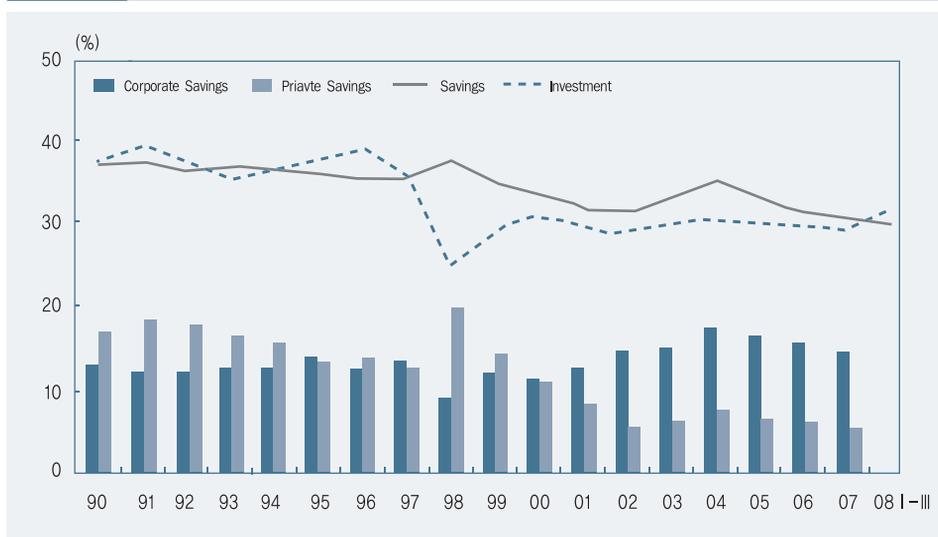
Note: Bonds include not only foreigners' purchases of domestic bonds, but also Koreans' issuance of bonds overseas.

Source: Bank of Korea.

3. Savings and investment

Korea's savings-investment gap was negative before the currency crisis, and in the process of rapid economic growth the nation had to procure financial resources from overseas markets. Since the crisis, however, the savings-investment gap has turned positive, not because of expanded savings, but because of dragging investment. In Korea, investment has fallen sharply, from 39.0% of GDP in 1996 to 29.4% in 2007, while savings has dropped much less significantly - from 35.5% to 30.6% of GDP. The decrease in aggregate savings (despite an increase in corporate savings, largely due to the progress of corporate restructuring) reflects a marked fall in private savings owing to a drop in Korean households' propensity to save. Financial liberalization has facilitated households' access to financial debt.

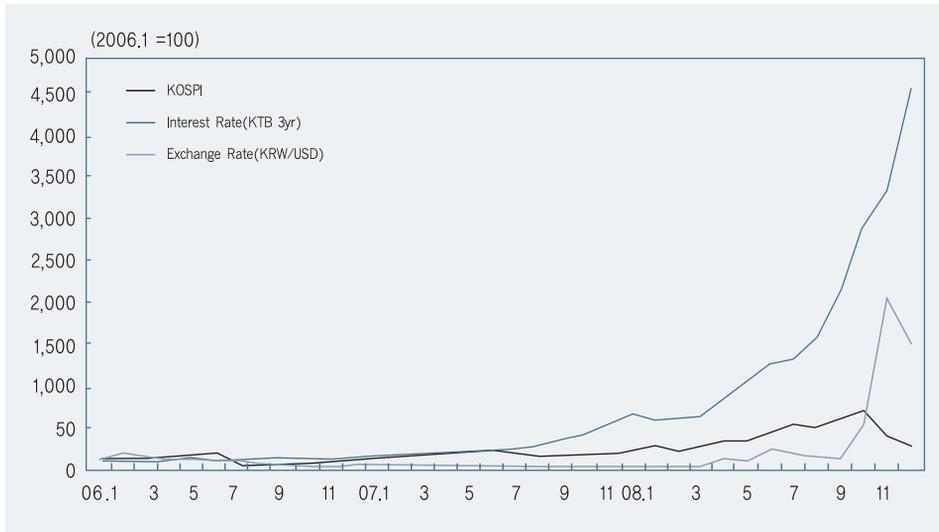
Figure 8 Private and Corporate Savings, and Investment Relative to GDP



Source: Bank of Korea.

4. Strengthened linkage between domestic and international financial markets

Foreign exchange liberalization has brought about stronger linkages between the domestic and international financial markets. In the past, foreign shocks such

Figure 9 Conditional Volatility¹⁾ of Financial Variables

Note: 1) Conditional standard deviation calculated from GARCH (1,1).

Sources: Bank of Korea and authors' calculation.

as a slowdown in the US economy spread to the Korean economy mainly through trade channels, and transmission of such shocks took time. Nowadays, however, due to capital account liberalization, they affect the domestic financial markets immediately. Since the US sub-prime mortgage crisis erupted in the middle of last year, domestic financial market variables have shown markedly increased volatility, influenced by US and global financial market developments.

Consequently, the link between capital flows and financial market variables has strengthened, even in the short-term perspective. As Table 4 suggests, the feedback between capital inflows and financial market variables like interest rates, exchange rates and stock prices has intensified. According to our analysis⁹⁾, moreover, foreign bond investment inflows also exhibit high correlations and feedback with price variables, especially with the covered interest rate differential. This seems to indicate the likelihood that a sudden shifting of capital inflows, reflecting developments in either the domestic or foreign economic environments, could cause short-term domestic financial market instability to increase.

9) Please refer to the Appendix.

Table 4 Granger Causality Tests¹⁾

	H_0 ²⁾	Equity Inflows (A) ↔ Interest Rate (B)	EI (A) ↔ FX Rate (B)	EI (A) ↔ Stock Prices (B)
Before FX Crisis (97.1.16~12.26)	A → B	0.68	0.02	0.06
	B → A	0.33	0.12	2.53*
Recently (07.1.5~08.8.29)	A → B	0.93	1.06	4.21**
	B → A	7.40**	4.89**	3.60*

Notes: 1) Weekly average data are used.

2) The null hypothesis ($A \nrightarrow B$) implies that A does not Granger cause B.

3) ** and * indicate rejection of H_0 at the 5% and 10% levels of confidence, respectively.

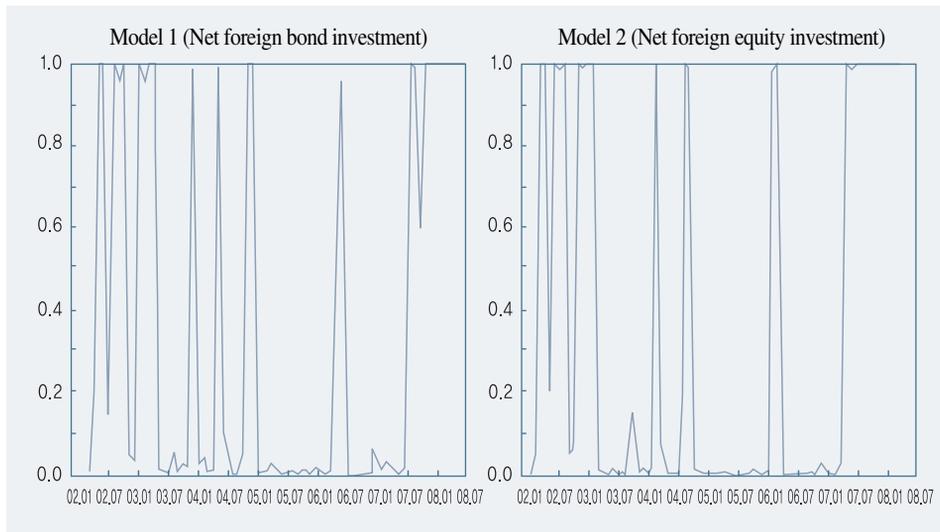
Source: Authors' calculation.

Furthermore, capital inflows respond to domestic financial variables more sensitively when those variables exhibit high volatility. To empirically confirm this, we have estimated a two-state Markov-switching VAR (MSVAR) model, and derived regime-dependent impulse responses of foreign capital inflows to price changes in the financial market. We have run two monthly MSVAR models. In Model 1, the endogenous variables are $\Delta \log(kospi)$, cid , $\Delta \log(er)$ and $bond$, where "kospi," "cid," "er" and "bond" denote the Korean stock price index, the covered interest rate differential¹⁰⁾, the exchange rate (KRW/USD), and monthly net foreign bond investment inflows, respectively. In Model 2, the endogenous variables are the same except for the last variable, for which we substitute monthly net foreign equity investment inflows.

We report the smoothed probability of the high volatility regime (Regime 1). Note that the probability of the low volatility regime (Regime 2) can be derived by $1 -$ the probability of the high volatility regime (Regime 1). Regardless of the type of model, transitions from the high to the low volatility regime have taken place rather quickly, except during the current high volatility regime, which has continued over a prolonged period. After the second half of 2007, when the US sub-prime mortgage problems began leading to major international financial market turmoil, the probability of the high volatility regime remains close to 1.

We turn now to the regime-dependent impulse responses. Figures 11 and 12

10) The covered interest rate differential is defined as follows: $i - i^* - (f - s) / s \times 400$, where i , i^* , f and s denote the (annualized) domestic 3-month interest rate, (annualized) 3-month LIBOR, the KRW/USD 3-month forward rate, and the KRW/USD spot rate, respectively.

Figure 10 Probability of High Volatility Regime (Regime 1)

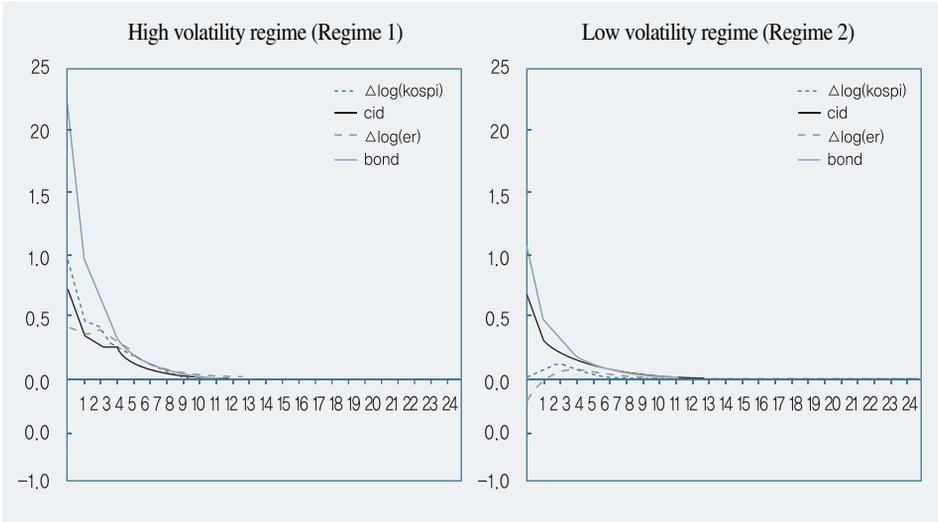
Source: Authors' calculation.

illustrate the responses of net foreign bond and equity investment inflows to stock price, covered interest rate differential, and exchange rate shocks. As is clearly shown, net foreign bond and equity investment inflows exhibit different impulse responses depending upon the regime. In Regime 1, net foreign bond and equity inflows react to shocks with greater magnitude than in Regime 2.

Specifically, in Model 1 net foreign bond investment inflows react to changes in stock prices and exchange rates when the economy is in the high volatility regime, while not seeming to react much in the low volatility regime. This suggests that foreign investor withdrawal of investment may be due to loss of confidence under the high volatility regime: if stock prices go down, foreign investors withdraw/shrink their bond exposure to a noticeable extent, while they do not react much to stock price changes in the low volatility regime. However, they are sensitive to movements of the covered interest rate differential in both regimes. This may, at least partly, be consistent with the recent observation of a surge in foreign bond investment inflows and concurrent widening of the covered interest rate differential.

We can also find similar stylized facts in Model 2. Net foreign equity investment inflows react to changes in stock prices in the high volatility regime, but do not react so much in the low volatility regime. This implies that in

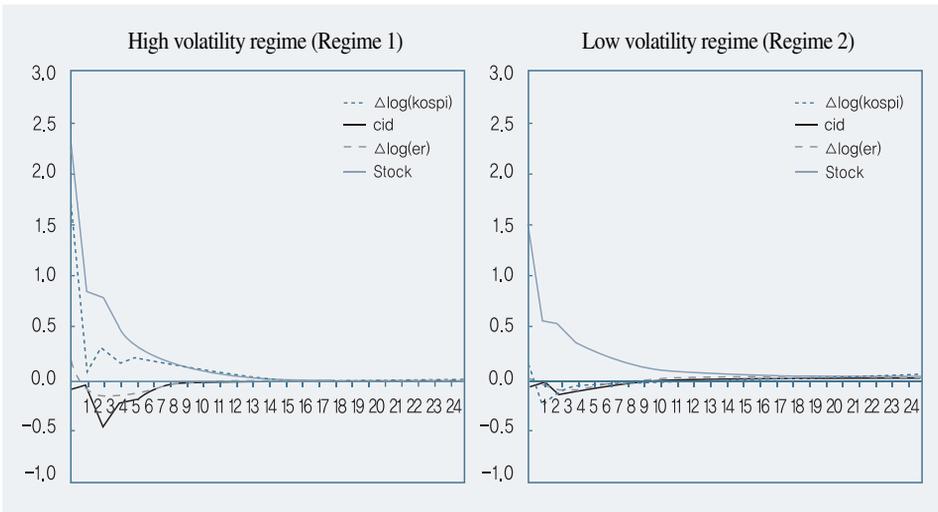
Figure 11 Model 1: Impulse Responses of Net Foreign Bond Investment Inflows



Source: Authors' calculation.

tranquil times foreign investment in equities is based on a long term perspective. Foreign investors seem concerned about portfolio composition adjustment under both regimes, however, as equity investment reacts negatively to the covered interest rate differential.

Figure 12 Model 2: Impulse Responses of Net Foreign Equity Investment Inflows



Source: Authors' calculation.

5. Increased influences of derivative-related trading on capital flows

Korea's external debt began to increase rapidly from 2006, led primarily by the rise in banks' overseas borrowing. Especially, there was a large increase in short-term external debt in 2006, and the ratio of floating external debt to foreign reserves rose significantly. External debt outstanding at the end of June 2008 was more than twice the figure at end-2005.

Table 5 External Debt and Assets
(end of year, billion USD)

	2005	2006	2007	June 2008
Total External Debt (A)	187.9	260.1	382.2	419.8
(Banks)	83.4	136.5	194	210.5
(Short-term)	65.9	113.7	160.3	175.7
External Assets (B)	308.6	366.7	417.7	422.5
Net External Assets (B-A)	120.7	106.6	35.5	2.7

Source: Bank of Korea.

Compared to the period before the currency crisis, however, the recent rise in external debt differs considerably in structure; a large part of it is attributable to loans extended against future foreign currency revenues, so called bridge financing. Exporters such as ship-builders, with foreign currency export revenue inflows scheduled, hedge the related exchange rate risks by selling forward exchange contracts. Similarly, asset management companies involved in overseas securities investment do the same, in preparation for sudden withdrawals by domestic investors.

In response to the increased selling of forward exchange contracts, domestic banks, as the forward exchange contract purchasers, need to adjust their foreign currency positions by selling foreign currency in the spot market. They procure these foreign currency needs via currency swap contracts with foreign bank branches and/or foreign investors wanting to exploit the arbitrage opportunity by buying Korean Treasury Bonds.¹¹⁾ The surge in foreigners' domestic bond

11) Note that both sides involved in these currency swap contracts prefer them, since foreign bank branches/foreign investors and domestic banks have comparative advantages, respectively, in USD and KRW funding.

investment in 2007, caused by a widening of arbitrage incentives amid the global financial market turmoil, has also contributed to the rapid increase in external debt.

Table 6 Forward Exchange Sales and Foreigners' Bond Investment

(billion USD)

	2005	2006	2007	1 st half	2 nd half	2008 1 st half
Selling of forward exchange contracts	71.7	99.7	126.0	53.5	72.5	92.8
(Ship-builders)	(22.3)	(43.1)	(62.3)	(24.4)	(37.8)	(40.3)
(Domestic investors)	(1.5)	(13.1)	(27.7)	(10.2)	(16.9)	(3.7)
Foreigners' bond investment	0.2	1.3	36.5	4.0	32.6	15.7

Source: Yang and Lee (2008).

Summing up, these increases in banks' overseas borrowings and foreigners' bond investment have been the cause of the recent surge in external debt. And all of these phenomena have been related to financial, especially cross-currency, derivatives. Even though short term debt has grown more than 2^{1/2} times since 2005, however, the risk of maturity mismatches in Korea, between foreign currency assets and liabilities, remains negligible. A high proportion of total external assets are also short-term, held by the BOK. Table 7 shows Korea's short-term assets to be over two times more than its short-term liabilities as a whole. This is in contrast to the situation prior to the Asian Financial Crisis, when Korean merchant banks engaged in the practice of borrowing short-term and lending long-term, leading to a maturity mismatch problem.

Table 7 External Debts and Assets by Sector

(end of period, billion USD)

	Total			G	MA	BK					Other
	ST	LT				ST	LT	DBK	FBB		
Debts											
2005	187.9	65.9	122.0	8.5	7.1	83.4	51.3	32.2	58.4	25.0	88.9
2006	260.1	113.7	146.3	10.3	9.6	136.5	96.1	40.4	82.1	54.4	103.6
2007	383.2	160.2	222.9	31.7	21.9	192.9	134.0	58.9	109.0	83.9	136.7
2008III	425.5	189.6	235.9	24.2	28.6	220.8	159.7	61.1	123.5	97.3	151.9
Assets											
2005	317.1	262.0	55.0	13.2	213.4	53.0	39.0	14.0	42.6	10.5	37.3
2006	380.9	297.1	83.8	17.0	243.9	63.2	39.9	23.3	53.3	9.8	56.9
2007	420.6	333.1	87.5	19.9	267.5	76.4	45.5	30.9	63.6	12.7	56.8
2008III	401.6	319.9	81.6	18.2	244.5	86.2	54.0	32.2	73.9	12.3	52.7

ST: short term; LT: long term; G: general government; MA: monetary authority;

BK: banks; DBK: domestic banks; FBB: foreign bank branches.

Source: Bank of Korea.

IV. Dealing with Capital Flows, and the Consequences

The Korean policy authorities have responded to the increased volume and volatility of international capital flows with various policy tools, such as sterilization policy, policy interest rate adjustments, and promotion of capital outflows. However, many of these policies have either not paid off sufficiently or have brought about unexpected results, often the opposites of those intended.

1. Effects of international capital flows on monetary policy operation

As shown in the previous chapter, both the Korean current and capital accounts remained in continuous surplus for years after the currency crisis. As this surplus trend continued, Korea's foreign reserves increased markedly, and the currency management burden rose substantially. While foreign exchange reserves provide a useful cushion against external shocks such as a terms of

trade shock, they do also create problems of their own. As it becomes increasingly difficult to soak up or sterilize the liquidity created by inflows using government or central bank-issued bonds, pressures for domestic currency appreciation build. Furthermore, the sterilization of foreign currency liquidity can lead to additional capital inflows via an increase in domestic interest rates, and to a rise in quasi-fiscal costs due to widening gaps between domestic and foreign interest rates (Montiel and Reinhart, 1997).

Table 8 Trends of International Reserves and MSBs

(billion USD)

	1997	2003	2004	2005	2006	2007	2008.9
International Reserves	8.9	155.4	199.1	210.4	239.0	261.2	239.7
Outstanding amounts of MSBs ¹⁾	23.5	105.5	142.8	155.2	158.4	150.3	134.0
Undivided earned surplus of BOK ¹⁾	1.8	2.2	-0.2	-1.9	-1.8	-0.4	-1.4

Note: 1) In trillion Won.

Source: Bank of Korea.

The Bank of Korea has executed sterilization by purchases of foreign currencies with low rates of return in exchange for high-yield domestic assets such as government bonds or central bank monetary stabilization bonds (MSBs) in the open market. Accordingly, the asset and liability structure of the Bank of Korea is concentrated on foreign assets and MSBs.¹²⁾ In consequence, the BOK's balance sheet has been vulnerable to domestic and foreign interest rate differences and exchange rate fluctuations. During 2004-2007, when the won/dollar exchange rate was in a state of constant decline, the accounts of the Bank of Korea turned into deficit. This deficit increased in 2005 and 2006, when the domestic and foreign interest rate differential reversed.

More recently, the effectiveness of monetary policy has been constrained by arbitrage transactions. Due to imbalances between supply and demand in the domestic forward exchange market since 2007, the opportunity for arbitrage transactions has increased considerably. That is, the cross-currency swap rate has been much lower than the domestic/international interest rate spread. As a result

12) In addition to sterilization, MSBs are also used in open market operations, which is their more important role.

of active arbitrage trading, foreign investors drastically increased their net buying of Korean bonds in 2007. This foreign buying spree was led by the head offices of foreign banks directly on behalf of their Korean branches (which face constraints in borrowing from their home offices). The figures show a remarkable rise particularly in capital inflows from France and Ireland, which have agreements with Korea on tax exemptions for interest income, especially from government bond investment.

Table 9 Structure of BOK Assets and Liabilities

		2003	2004	2005	2006	2007	2008.9
		(%)					
Assets	Domestic Assets	10.5	8.8	14.4	14.6	17.7	9.5
	Foreign Assets	89.5	91.2	85.6	85.4	82.3	90.5
	Total	100.0	100.0	100.0	100.0	100.0	100.0
Liabilities	Domestic Liabilities	95.1	90.8	93.1	91.2	91.2	94.9
	(MSB)	(49.8)	(57.8)	(58.0)	(46.7)	(52.6)	(44.5)
	Foreign Liabilities	4.9	9.2	6.9	8.8	8.8	5.1
	Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: Period-end basis.

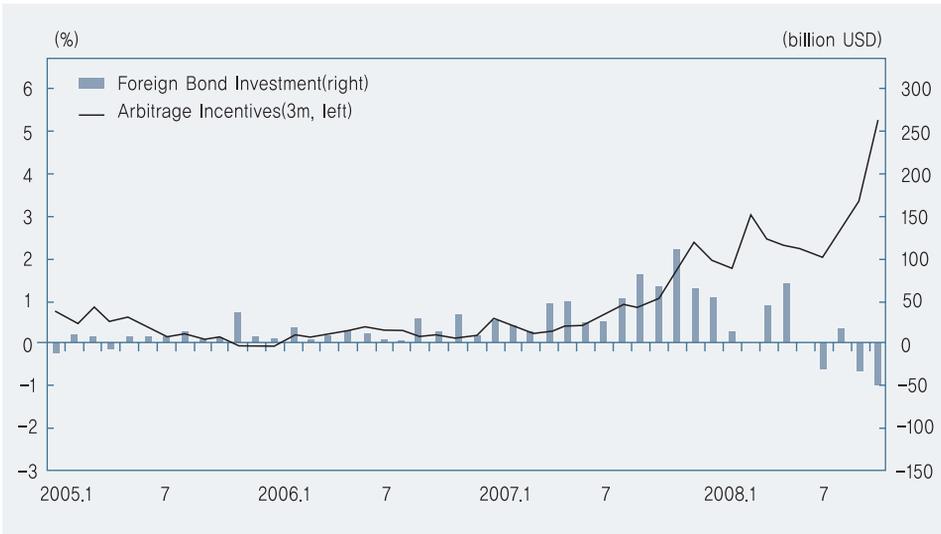
Source: Bank of Korea.

The inflow of foreign bond investment has driven up demand for bonds such as TBs and MSBs. And as this trend has put downward pressure on long-term market interest rates, it has limited the effectiveness of upward adjustments of the policy rate. Responding to the increase in liquidity, the Bank of Korea raised its policy rate several times. Market rates did not rise to the same extent in response, however, at least partially due to the foreign capital inflows.

Branches of foreign banks are also engaged in arbitrage transactions. Their investments in TBs and MSBs via cross-currency swaps, funded by overseas borrowing, put downward pressure on the rates on these instruments.¹³⁾ We

13) In the case of overseas borrowings, assets and liabilities increase simultaneously, and net foreign assets therefore do not change, and neither does the monetary aggregate. The overseas borrowing by banks hence does not itself directly affect the monetary aggregate. It can affect the monetary aggregate by pushing market interest rates down, however, which ultimately leads to a weakened correlation between the policy rate and monetary aggregate growth.

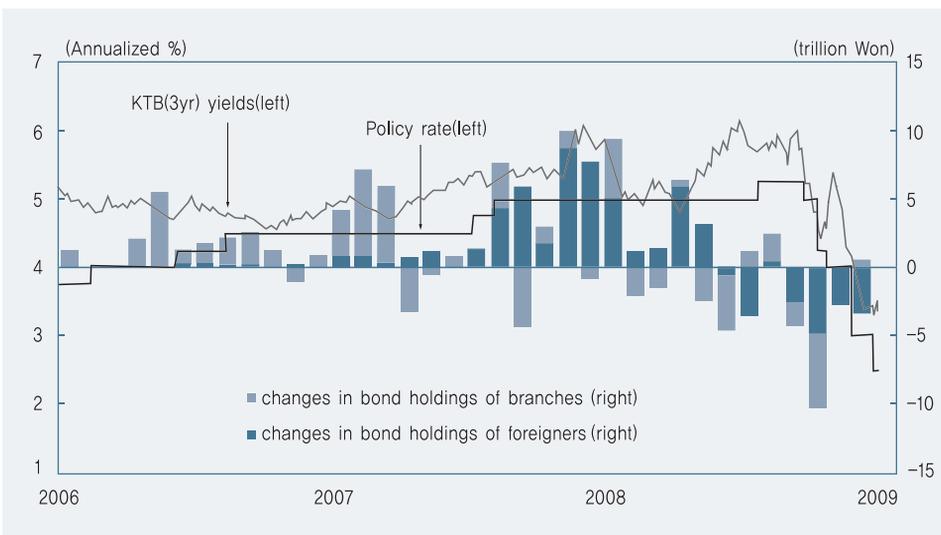
Figure 13 Arbitrage Incentive and Foreign Bond Investment



Source: Bank of Korea, Financial Supervisory Service, Bloomberg.

generally expect the following transmission mechanism: policy rate hike → rise in long-term market interest rates → rise in deposit and loan rates → slowdown in loan growth → slowdown in liquidity growth. However, the arbitrage

Figure 14 Interest Rates and Foreign Bond Purchases



Sources: Bank of Korea, Financial Supervisory Service, Korea Securities Depository.

transactions by foreign branches and foreigners prevent the transmission channel of monetary policy from operating at full capacity. As a result, despite increases in the policy rate, liquidity growth continued for a considerable time.

2. Constrained effectiveness of capital control measures

From 2000, both the current and the capital accounts posted continuing surpluses. In response, the government took a series of steps to encourage capital outflows and discourage capital inflows, in order to ease pressures in the foreign exchange market. To discourage speculative transactions, regulations on the positions of domestic banks participating in the NDF market were imposed in 2004. Instead of speculation, however, arbitrage opportunities emerged. Foreigners invested in domestic assets such as TBs and MSBs and hedged the related exchange rate risk through the NDF market (Suh, 2005).

In order to promote capital outflows, the government revised the 'Foreign Transaction Regulations' five times in 2006 and 2007. The revised legislation included, among other measures, relaxation of restrictions on overseas real estate investment, encouragement of fund-type overseas portfolio investment, and deregulation to boost corporate expansions overseas. Accordingly, residents' investment in overseas real estate, after standing at a mere 22 million USD in 2005, increased dramatically to reach 1.3 billion USD in 2006 and 2.7 billion USD in 2007. Overseas equity investment also rose substantially, from 11 billion USD in 2005 to 24 billion USD in 2006, and then to 50 billion USD in 2007. However, due to the integration of domestic and foreign financial markets and the development of financial derivatives markets in Korea, some government measures have brought opposite results to the policy intent, in a series of unexpected events. Indeed, capital outflows via overseas equity investment increased markedly, but at the same time investors (funds) sold forward exchange on a large scale to hedge against exchange rate risk, leading to a

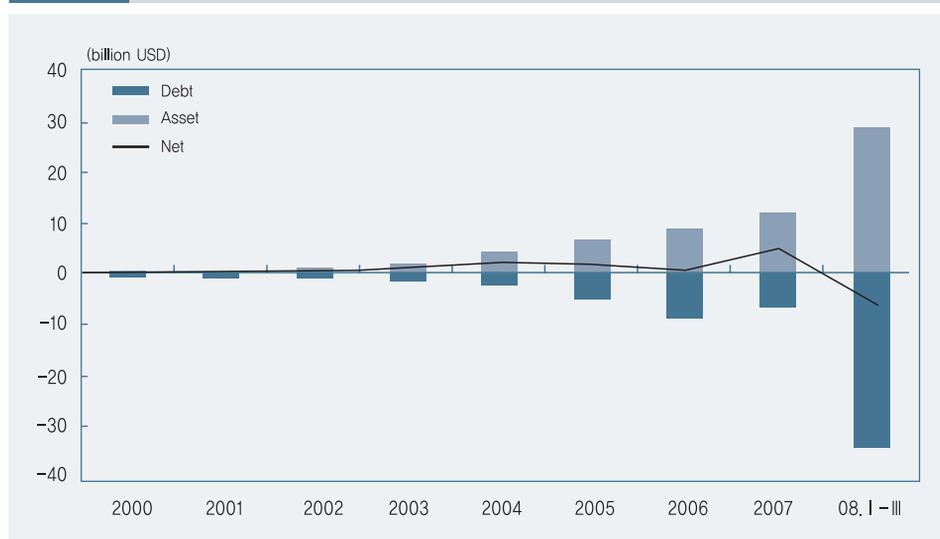
Table 10 Overseas Equity Investment and Related Forward Exchange Contracts

	(billion USD)				
	2005	2006	2007	1 st half	2 nd half
Overseas securities investment	11.1	24.1	50.1	25.5	24.7
(selling of forward exchange)	(1.5)	(13.1)	(27.7)	(10.2)	(16.9)

Source: Yang and Lee (2008).

considerable increase in overseas foreign currency borrowings. In other words, measures aimed at promoting capital outflows had the unexpected consequence of increasing capital inflows.

Figure 15 Derivative Transactions between Residents and Non-residents¹⁾



Note: 1) Based on balance of payments data.

Source: Bank of Korea.

The effectiveness of such capital control measures has weakened considerably relative to the past. This may be attributable to the development of financial derivatives such as forward exchange contracts and cross-currency swaps, in conjunction with the deepened correlation between international and domestic financial markets. Once arbitrage opportunity is created, market participants using various derivative instruments find ways of circumventing the controls and realizing arbitrage profits.

3. Reversal of net capital outflows due to international financial market unrest

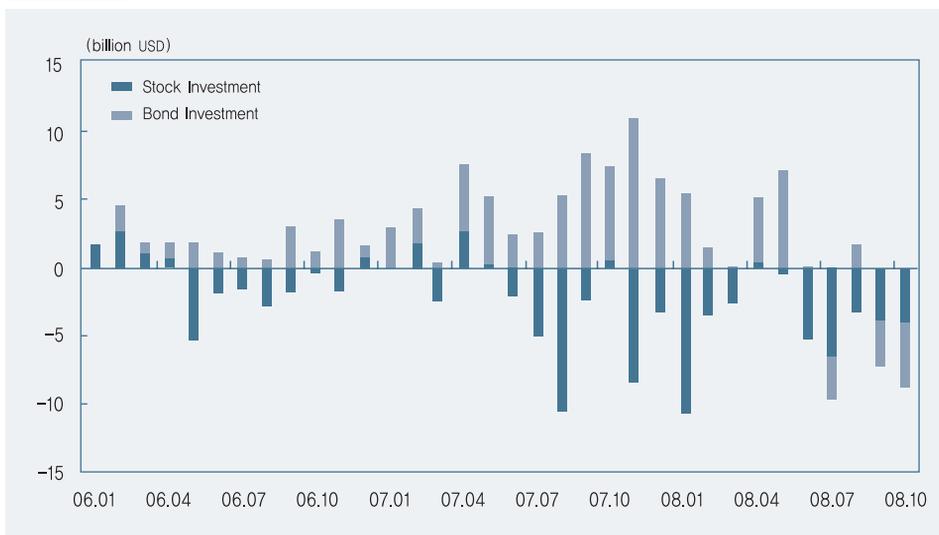
With the deepening of international financial market unrest since the second half of 2007, net foreign capital outflows from Korea have continued, and the values of the won and of stock prices have thereby declined considerably. In the

stock market, foreigners' net selling of Korean stocks has continued across the major industries as a whole, leading stock prices to decline since November 2007. Accordingly, the share of foreign in total equity ownership, which surpassed 40% at the end of 2004, had fallen to 27.4% by end-2008. This phenomenon seems related to the following facts: (i) the share of foreign shareholding in Korea had been particularly high compared to those in other emerging economies, and (ii) the Korean stock market is highly liquid and its total capitalization is sizable.

In the bond market, the incentive for arbitrage trading expanded markedly, and foreign bond investment funds flew into Korea on a large scale from the third quarter of 2007. Since May of 2008, however, international financial market stability has deteriorated, and the trend of foreign capital flows has turned to outflows.

Figure 16

Foreigners' stock and bond investment



Sources: Bank of Korea, Financial Supervisory Service, Korea Securities Depository.

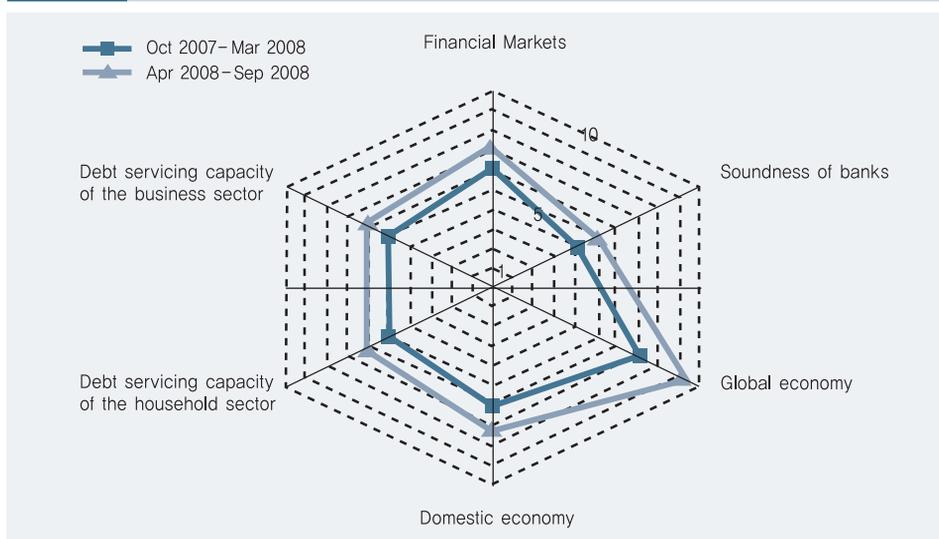
With the process of financial institutions' deleveraging accelerating rapidly, due to the international financial market credit crunch, the volume of net stock selling by foreigners has been relatively high in Korea. This is mainly attributable to the past huge increase in domestic stock prices, which has led to similarly huge increases in appraisal profits. The abundance of liquidity in the

stock market has also made withdrawal of investment funds easy.

Using the Global Financial Stability Map (GFSM) model¹⁴⁾, the Bank of Korea examined the stability of the Korean economy by sector for the six-month period of April to September, 2008. We see that bank soundness has shown a relatively high level of stability, and although the debt servicing capacities of firms and households have fallen somewhat from their previous levels, they by and large still maintain stable levels. Global economic instability has increased remarkably, however, and the Korean financial market and economy are showing signs of some instability as well.

Figure 17

Korean Financial Stability Map



note : 1) The closer to the 10th decile a sector's value, the more unstable this sector is.

2) Some critical values and analytical indicators were improved.

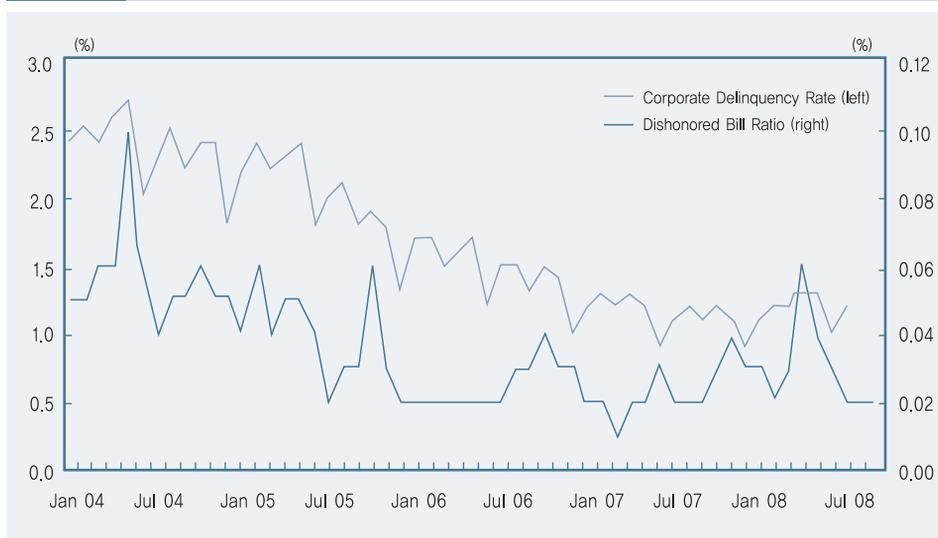
Source : Bank of Korea.

Looking at the business and household sectors here in more detail, we note that corporate loans have been on a trend of increase - growing 19.5% in 2007. As of end-2007, however, the delinquency rate and dishonored bill ratio remained in the low 1% and 0.05% ranges, respectively. Moreover, given that the substandard and below loan ratio has remained at only 0.8%, and that firms'

14) Please refer to IMF, Global Financial Stability Report, Oct. 2007. For the model developed by the Bank of Korea, see Bank of Korea, Financial Stability Report, Apr. 2008.

financial statuses have been sound, credit risk in the corporate sector is evaluated to have been still low.

Figure 18 Dishonored Bill Ratio¹⁾ and Corporate Delinquency Rate



Note: 1) Amount basis, including electronic-based payments.

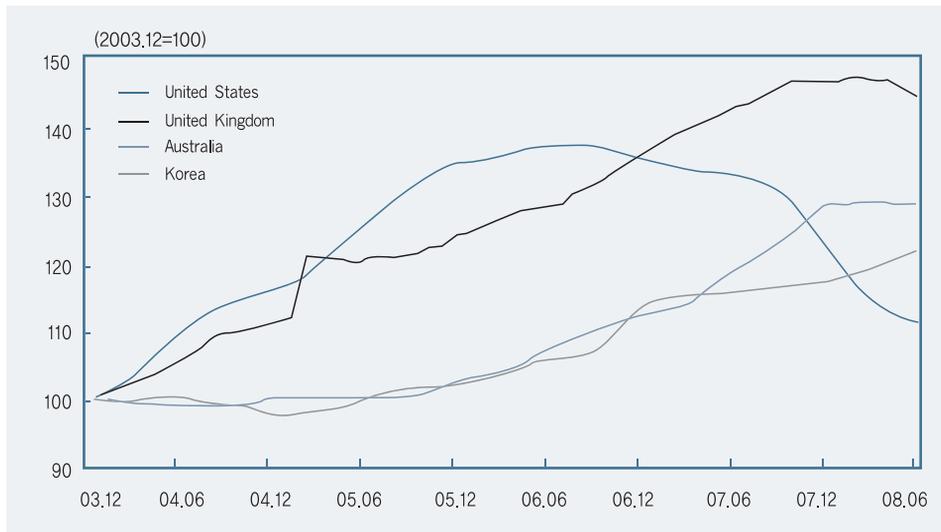
Source: Bank of Korea.

In the case of housing finance loans, which account for a considerable share of overall household loans, their ratio to nominal GDP stood only at 32% as of end-2007¹⁵⁾. Moreover, the average LTV ratio in Korea stands at 50%, which is also far below the corresponding ratios in the US and other developed countries (70~80%). The share of securitized housing finance loans in Korea is a mere 3 to 4%, compared to the corresponding figure of over 50% in the US, and the average delinquency ratio remains at the 1% range. Given these figures, the rate of housing price growth in Korea is not high relative to other countries, and housing finance loans are therefore unlikely to become non-performing.¹⁶⁾

In response to the rapid capital outflow and the drastic depreciation of the won following foreign shocks since the second half of 2007, the government and the

15) Compared to 83% in both the US and UK as of the end of 2006.

16) The Bank of Korea has evaluated the debt service burden for households which have taken out housing finance loans, using micro data. According to this evaluation, the debt service ratio of borrowing households' housing finance loans is 20.2%, and debt service on households' borrowing is therefore unlikely to be difficult.

Figure 19 Housing Price Indices of Major Countries

Source: Bloomberg, Kookmin Bank.

Bank of Korea have taken wide-range of countermeasures. For example, in response to a marked expansion in price volatility in the domestic currency interest rate swap market and the bond market in November 2007, the Bank of Korea purchased government bonds in the market directly, to thereby mitigate interest rate volatility.

The government has taken measures to increase foreign currency supply in the FX markets, by easing the tax burdens on foreign banks' branches borrowings from their headquarters (returning the ceiling on interest costs recognized as expenses from three times to six times capital). In cases of herd behavior arising in the foreign exchange market, moreover, the authority has intervened in the swap market to conduct smoothing operations since November 2007.

Recently, the Bank of Korea decided to introduce a competitive auction swap facility, effective from October 20, 2008, to enhance the predictability and effectiveness of foreign currency supply and to promote stability in the foreign currency funding market. Under this program, the BOK conducts FX sell & buy swaps or cross-currency swaps (pay) with banks at trade terms (amounts and interest rates) decided through competitive auction. The Bank of Korea expects that the efficient supply of foreign currency to local foreign exchange banks via this system will contribute significantly to foreign exchange market stability. As

other major economies began providing guarantees on interbank transactions, moreover, the Korean government announced on Oct 19 2008 that it would take similar measures, to help domestic banks avoid comparative disadvantages in overseas funding.¹⁷⁾

On October 30, 2008, the Bank of Korea announced the establishment of a temporary bilateral currency arrangement (swap line) of up to 30 billion US dollars with the Federal Reserve to mitigate the spread of difficulties in obtaining US dollar funding. On December 12, 2008, the Bank also announced an increase in the size of the Won-Yen swap arrangement with the Bank of Japan from 3 billion US dollars equivalent to 20 billion US dollars equivalent, and the establishment of a bilateral currency swap arrangement with the People's Bank of China of up to 180 billion RMB/38 trillion KRW.

During October and December 2008, the Bank of Korea, together with the government, has provided FX liquidity amounting to 38 billion US dollars to support exporters and importers by both offering small and medium sized enterprises FX loans and refinancing export and import bills. The BOK has also increased its provision of the won liquidity through open market operations. Since mid-September 2008, the BOK injected a total of 20.7 trillion won into the Korean financial markets. And together with the central banks of advanced countries, the BOK cut its policy rate three times between October 2008 and January 2009 by 275 bp, from 5.25% to 2.5%.

17) Financial Services Commission, "Proposed Measures to Overcome Uncertainties in the International Financial Markets," Press Release, Oct 19, 2008.

Table 11 Bank of Korea's Responses to the Global Financial Crisis

	Policy responses
2008 Sep. 18	- Providing liquidity of 3.5 trillion won through RPs
Oct. 9	- Lowering the Base Rate (5.25%→5.00%) and the interest rates on Aggregate Credit Ceiling Loans (3.50%→3.25%, ACCL rate hereafter in this table)
Oct.17	- Introducing a 「competitive auction swap facility」 to enhance the predictability and effectiveness of foreign currency supply and to promote stability in the foreign currency funding market (effective Oct. 20, '08)
Oct.21	- Providing Korean won currency liquidity as part of measures to stabilize the local financial market, by repurchasing of monetary stabilization bonds held by institutional investors prior to maturity
Oct. 23	- Expanding the volume of Aggregate Credit Ceiling Loans (6.5 tril. won→9.0 tril. won, effective Nov. '08) - Providing the basis for flexible change of the targets of aggregate credit ceiling loan support, by adjusting the ceiling provided to commercial banks in accordance with the situation
Oct. 24	- Providing liquidity of 2 trillion won to securities and asset management companies via securities finance through RPs
Oct. 27	- Lowering the Base Rate (5.00%→4.25%) and ACCL rate (3.25%→2.50%) - Deciding to broaden the collateral eligible for open market operations to include debentures issued by banking institutions and other special entities, so as to shore up financial market stability by facilitating fund flows in the capital markets (effective Nov. 7, '08)
Oct. 30	- Establishing a temporary swap line of up to 30 billion US dollars with the Federal Reserve (to expire by Apr. 30, '09)
Oct. 31	- Providing liquidity of 1 trillion won through long-term (91-day) RPs
Nov. 4	- Deciding to provide foreign currency liquidity amounting to 10 billion US dollars to support export financing to SMEs
Nov. 7	- Lowering the Base Rate (4.25%→4.00%) and ACCL rate (2.50%→2.25%)
Nov. 11	- Providing liquidity of 1 trillion won through long-term (63-day) RPs secured by bank financial debentures
Nov. 14	- Deciding to implement a supplement plan to offer foreign currency loans secured by export bill purchased.
Nov. 17	- Deciding to outright purchase government bonds (1 trillion won worth of government bonds bought on Dec.19)

	Policy responses
Nov. 21	– Providing liquidity of 2 trillion won through 28-day RPs
Nov. 24	– Deciding to provide 5 trillion won to a newly created bond stabilization fund
Dec.3	– Paying interest on banks' required reserve deposits, and including bonds issued by the Korea Housing Finance Corporation(KHFC) among the eligible securities for open market operations (effective Dec. 9, '08)
Dec.11	– Lowering the Base Rate (4.0%→3.0%) and ACCL rate (2.25%→1.75%) – Deciding to designate twelve securities firms as eligible counterparties for BOK's RP operations (effective from Dec.15)
Dec.12	– Increasing the size of Won–Yen swap arrangement with the Bank of Japan from 3 billion US dollars equivalent to 20 billion US dollars equivalent – Establishing currency swap arrangement with the People's Bank of China of up to 180 billion RMB/38 trillion KRW
Dec.16	– Providing liquidity of 2 trillion won through long-term (91-day) RPs secured by bank financial debentures
Dec.19	– Providing liquidity of 2 trillion won through long-term (28-day) RPs
Dec.22	– Providing total liquidity of 10.4 billion US dollars through competitive US dollar loan facility auctions using US dollar proceeds of swap transactions with the Federal Reserve (Dec. 2, Dec. 9, Dec. 22)
2009 Jan.9	– Lowering the Base Rate (3.0%→2.5%) and ACCL rate (1.75%→1.50%)
Jan.13	– Providing liquidity of 1.5 trillion won through long-term (91 days) RPs

V. Conclusion: The Global Credit Crisis and Challenges for Korea

This paper has discussed Korea's experiences in opening up to capital flows since the East Asian crisis. Capital account liberalization accompanied by development of the financial derivatives market has invited challenges to the conduct of monetary policy, to financial market stability, and to the management of capital flows.

The recent unrest in advanced countries' financial markets stemming from the

US sub-prime mortgage crisis has had a considerable impact on emerging markets. These countries have been suffering from the ‘systemic sudden stops’ of Calvo et al. (2008), as the process of major international financial firms’ deleveraging intensifies and foreign investors accelerate their sell offs.

As seen recently in the process of international credit crisis propagation, despite the health of Korea’s economic fundamentals, volatility in its domestic financial market has sharply increased. Foreigners have withdrawn their equity investments earlier and more intensively from Korea than from other emerging markets. The magnitude of outflows from Korea has been especially large, as well. Due to the collateral benefits from financial integration, however, such as institutional and financial market development and improved governance, overall financial system stability has been preserved.

The recent capital account balance reversal combined with the current account deficit has resulted in a foreign exchange market plagued by imbalances the exact opposite to those of the recent past, and foreign currency liquidity conditions have been often aggravated. As vulnerability in the international financial market has spread quickly to the domestic market, the volatility of financial markets such as the bond and stock markets has also sharply risen.

Although external debt has shown a marked increase since 2006, in view of international standards (IMF/World Bank) Korea’s external debt indicators are sound. Compared to the period prior to the 1997 foreign exchange crisis, the recent increase in external debt differs considerably in structure and details. The volume of foreign reserves has grown significantly, and a large part of the recent increase in external debt results from loans extended against future foreign currency receipts. In 1997, domestic financial institutions operated their short-term borrowings by extending long-term loans, leading them to a lack of short-term foreign currency liquidity. Now, however the short-term foreign currency liquidity ratio, which indicates the degree of foreign currency term mismatches, remains stable. As Table 7 demonstrates, moreover, the economy as a whole does not face risk of foreign currency maturity mismatch, as Korea’s short term assets are over double its short term liabilities.

What have we learned from this unprecedented spectacular international crisis? First, once the capital account is liberalized, existence of a market structure in which market forces function efficiently is an absolute necessity.¹⁸⁾

18) For example, Kim and Song (2007) suggest that arbitrage opportunity in the NDF market evaporates much faster than that in the domestic forward market.

That is, even a small amount of capital flows should immediately remove opportunities for arbitrage. Otherwise, continuing capital flows aimed at realizing arbitrage profits may bring about costs without any accompanying benefits.¹⁹⁾ Second, prudential regulation and supervision of banks' external borrowing, especially short term, need to be further strengthened. Current criteria such as the liquidity ratio and the loan to deposit ratio may be insufficient.²⁰⁾ Last but not least, capital flows such as equity investment and FDI, that are less sensitive to macro variables than debt and borrowings, can prove to be more stable sources of foreign capital. In that regard, an economic environment more suitable to attracting FDI is crucial for dealing with capital flows.

19) Rodrik (2006) computes the cost of short term debt when emerging economies amass foreign reserves.

20) The liquidity ratio is calculated by dividing assets with maturities of 3 months or less by liabilities with maturities of 3 months or less. The financial supervisory authority recommends a liquidity ratio of 100% at least. Since Oct. 2008, period of maturities has changed to one month or less from the previous three months or less.

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[Appendix]**Determinants of Net Inflows of Foreign Bond Investment**

Investigation of the determinants of net foreign bond investment inflows to Korea shows them to be closely connected with the variables related to profitability, especially fluctuations in the covered interest rate differential. When we conduct a correlation analysis, the correlation between foreigners' bond investment and the gap between domestic and foreign interest rates is not great, whereas the correlation between foreign bond investment and the covered interest rate differential (CID) is clear. Moreover, the result of the Granger Causality Test establishes that there is a causal relationship between CID and bond investment.

Cross Correlations and Granger Causality Tests**(2005.1~2008.2)**

Cross Correlations		Lags (in months)		
		-2m	-1m	0m
	Interest differential	0.369	0.449	0.563
	CID	0.538	0.687	0.847
	CID-Risk Prm (CDS)	0.591	0.743	0.890
Granger Causality		Lags (in months)		
		1m	1~2m	1~3m
	Interest differential → Bond inflows (F-value)	0.01	0.17	0.38
	Δ CID → Bond inflows (F-value)	1.66	13.43***	11.68***
Δ (CID-CDS) → Bond inflows (F-value)	3.01***	21.35***	16.69***	

Note : 1% significance(***)

We also conduct a regression analysis on the determinants of foreigners' bond investment by setting return on investment, transaction costs and the degree of bond market development as the major explanatory variables. According to the results, there is rarely any explanatory power of plain domestic and foreign interest rate differences over foreigners' bond investment inflows to Korea, while the explanatory power of the covered interest rate differential is in contrast very high.

Determinants of Foreign Bond Investment

(Quarterly data : 2001.1/4~2008.1/4)

	Pooled Regression		Random Effect Model	
Constant	-27.2***	-15.64***	-22.2***	-17.4***
Distance ij	1.2***	0.74***	0.78	0.69
GDP _i ×GDP _j	0.01	-0.00	-0.03	0.02
Bond mkt cap / GDP	26.5***	17.94***	26.2***	20.1***
Int diff ij	0.32*		0.08	
CID ij		1.46***		1.39***
Adjusted R ²	0.32	0.41	0.29	0.29
Samples	189	189	189	189

Note : 10% significance(*), 1% significance(***)