Financial Stability Report

April 2008

THE BANK OF KOREA

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The Bank of Korea publishes *Financial Stability Report* to encourage lively discussion among market participants on financial stability by providing comprehensive analysis and assessment of the current state of the domestic financial system and potential risk factors therein.

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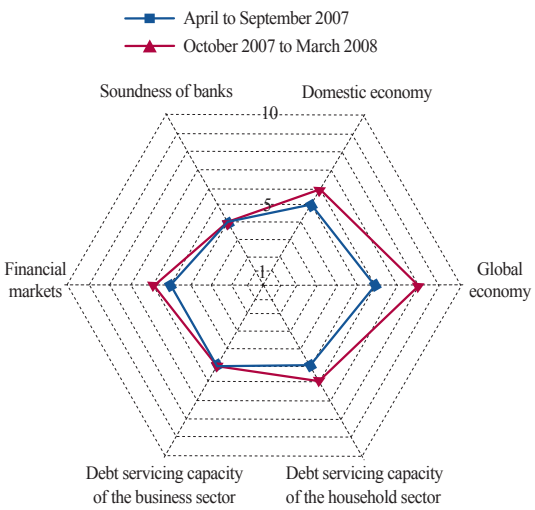
Ⅰ. Overview

Korean financial stability map



Note: 1) The closer to the 10th decile a sector's value, the more unstable this sector is.
Source: Bank of Korea

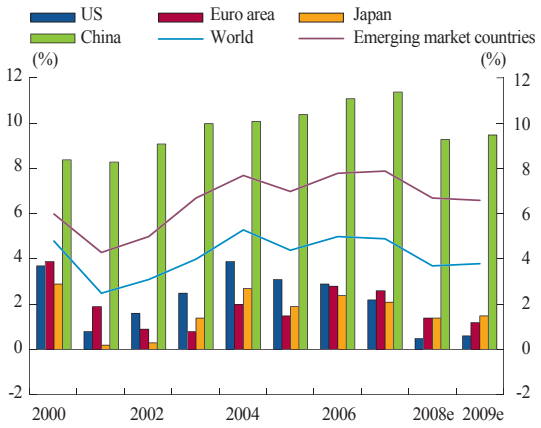
1 The Korean financial system as a whole appears stable, helped by the continuing financial soundness of the banking sector. In terms of macroeconomic conditions, however, there are some potentially destabilizing factors present – such as the increased downside risks faced by the world economy, the rises in international raw material prices, and the turmoil in global financial markets.

Sectoral stability assessment by using the financial stability map[1)] shows instability in the global economy sector to have increased in the October 2007 to March 2008 period, relative to its previous level (during April to September 2007). The soundness of banks and the debt servicing capacity of the business sector have shown relatively high levels of stability. However, while the financial

1) For further information on the financial stability map, see <Appendix 1> 'Overview of the Korean financial stability map'.

market and domestic economy sectors, and the debt servicing capacity of the household sector, maintain stable levels on the whole, the degree of their stability is assessed as having fallen somewhat from the previous period.

Economic growth and outlooks for selected countries

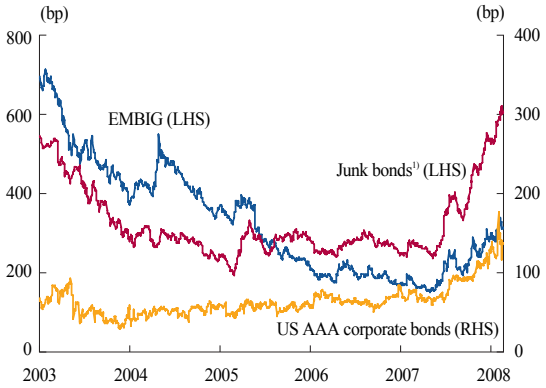


Source: IMF, World Economic Outlook (Apr. 2008)

2 In line with visible signs of a slowdown in the global economy, downside risks to domestic economic growth have also increased.

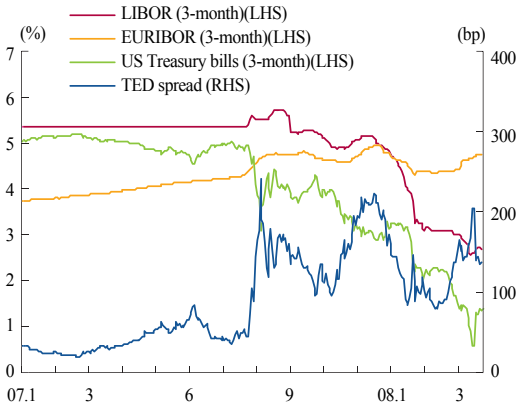
Since the fourth quarter of 2007, US economic growth has slowed sharply, affected by the deepening housing market slump. Economic growth has also weakened in the euro zone, and the recovery trend of the Japanese economy remains feeble. Emerging market economies, however, including China and India, have continued brisk tracks of growth. During 2008, growth for the global economy is forecast to decline to the upper 3% range, owing to spillovers from the US subprime mortgage turmoil and to persistent high prices of oil.

Credit spread trends



Note: 1) US corporate bonds rated BB or below
Source: Bloomberg

Short-term market interest rate trends



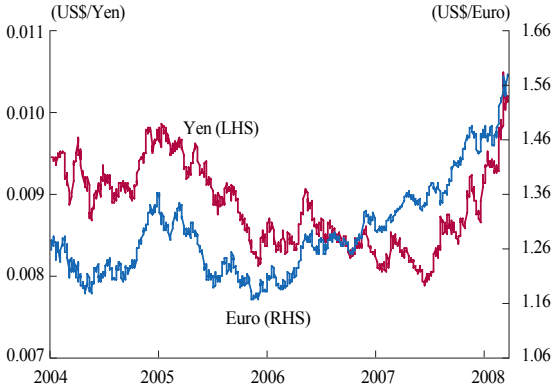
Note: 1) LIBOR (3-month) rate - US Treasury bills (3-month) yield
Source: Bloomberg

International financial markets have shown unstable movements since the second half of 2007, as exacerbation of the US subprime mortgage turmoil led to a deepening credit crunch and heightened volatility of financial asset prices.

Credit spreads have continued their upward trend, owing to an overall reduction in risk appetite, while stock prices have plummeted at each new disclosure of problems in the subprime mortgage market. The TED spread, a measure of credit risk in the money market, has maintained a high level in response to the sharp rise in counterparty risks. US long-term interest rates have continued on a steep downward trend, in line with the increased preference for safe assets along with concerns about economic slowdown.

The US dollar has continued a generally weakening trend against major currencies, in line with forecasts of a US economic slowdown and successive policy rate cuts by the US Fed. The Japanese yen has meanwhile shown continued strength, amid

USD/Yen and USD/Euro exchange rate trends

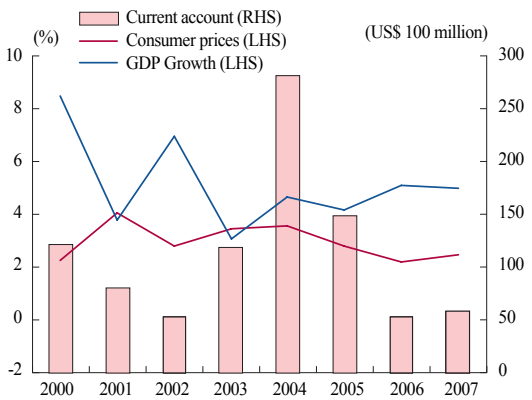


Source: FRB

worries about a yen carry trade unwinding, sparked by the uncertainties in international financial markets. The heightening of such worries could cause a further rallying of the yen, and in a vicious cycle a strong yen could in turn give yen carry trade unwinding an additional boost, thereby contributing to a rapid shrinking of global liquidity and worsening of financial market stability.

Amid the continuing slump in the US housing market, leveraged funds investing in high-risk assets, such as hedge funds, are going through deleveraging processes. In light of this, uncertainty in the international financial market seems likely to persist. Nevertheless, the aggressive policy responses of central banks are easing the worries about a credit crunch, and large scale write-downs implemented by major financial institutions are helping to alleviate international market unrest.

Real economic indicators in Korea

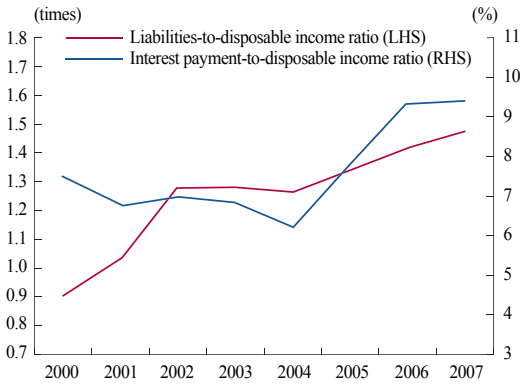


Note: 1) Percentage changes from the previous years
Sources: Bank of Korea, Korea National Statistical Office

The domestic economy exhibits some signs of adjustment in its pace of expansion, largely due to the weakening domestic demand

recovery, while uncertainties surrounding future economic developments seem likely to increase owing to the slowdown of global economic growth. Prices continue to show a rapid rise, influenced by high oil prices, although this trend is expected to ease somewhat from the second half of 2008. The current account, after recording a surplus in 2007, is projected to shift into deficit for 2008, as imports rise significantly due to higher prices of oil and other raw materials.

Liabilities-to-disposable income and interest payment-to-disposable income ratios



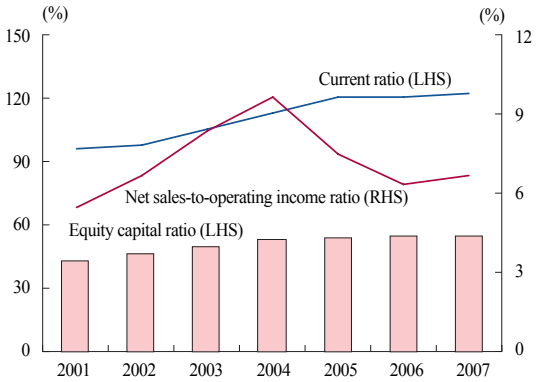
Sources: Flow of funds statistics and national accounts, Bank of Korea

3 Household sector financial debt expanded at a somewhat slower rate during 2007. Nevertheless, the debt servicing capacity in this sector appears weakened, considering the increase in the debt-to-disposable income ratio, and the growth in interest payment burdens with the rise in interest rates.

As the debt service ratio (DSR) of home mortgage loan-holding households is estimated to have risen for the second consecutive year in 2007, no real improvement appears to have been made in terms of cash flow, especially for households

with excessive debts relative to their incomes.

Profitability and financial soundness of businesses

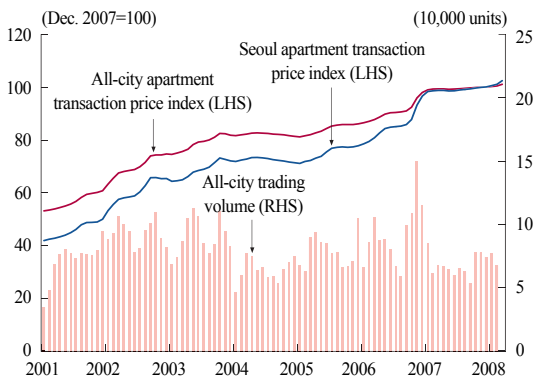


Sources: KIS-Value, Bank of Korea

4 The corporate sector as a whole shows sound debt servicing capacity, in line with improved profitability, continuing financial health, and comfortable levels of liquidity.

Among the small and medium-sized enterprise (SME) sector, however, the polarization of profitability in accordance with export status and industrial sector has widened, and the dependence on borrowings has continued its upward climb.
It is hence likely that a worsening of economic conditions could lead to deteriorations in management stability among some financially-vulnerable businesses.

Apartment transaction price indices and trading volume



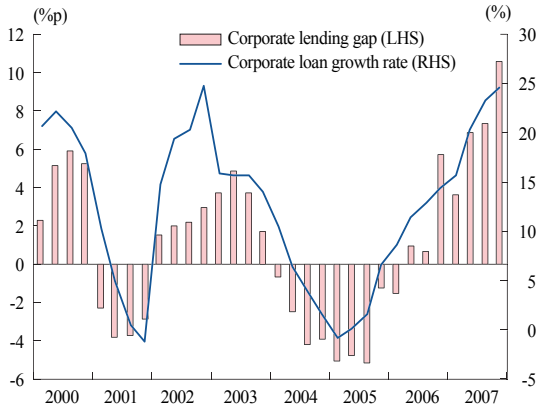
Sources: Kookmin Bank, Korea Land Corporation

5 In the real estate market, while the upward housing price trend is generally contained, wide price movement variation has been seen, depending upon the region and the size of the property concerned.

By region, prices of apartments in the southern (Gangnam) area of Seoul and in the

provinces remained mostly stable. In the northern (Gangbuk) area of Seoul, however, prices exhibited a relatively steep rising trend, influenced by expectations of extra price gains from local development projects. Looking at the market in terms of housing size, prices for medium and large sized apartments have been downward stabilized, owing to tighter mortgage lending standards and stricter enforcement of tax laws related to property ownership. Prices for small sized apartments, on the other hand, exhibited a relatively sharp upward trend.

Bank corporate loan growth rate and corporate lending gap



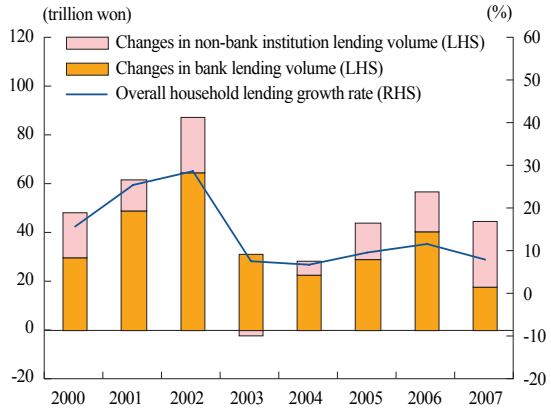
Source: Bank of Korea

In the lending market, loans to SMEs increased massively, as competition for asset expansion continued among domestic banks. The volume of loans extended to large corporations resumed its uptrend during 2007 as well, after a decline in 2006, as fund demand related to M&As and equipment investment grew.

The ratio of corporate loans to nominal GDP has risen steeply, in line with the sharp increase in corporate lending volume. If the

growth rate of corporate lending continues to surpass that of real economic activities, the soundness of bank's assets, especially their loans to SMEs with lower credit ratings, is likely to deteriorate if the business environment worsens.

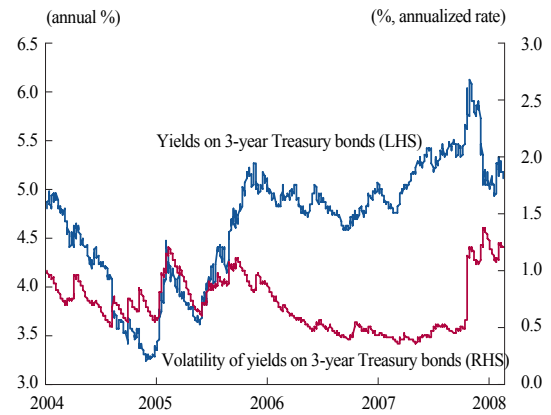
Household lending trends



Source: Bank of Korea

The rate of growth in household lending slowed in 2007, owing to a reduced demand for housing finance loans. The percentage of housing finance loans extended to borrowers with lower credit rating meanwhile stands at over 10%. However, the possibility of massive default among lower credit borrowers does not appear high, as a considerable portion of the loans concerned have been issued in accordance with various safeguard standards including the LTV requirement, and the delinquency rate on them has remained steadily low.

Treasury bond yields and volatility[a)]



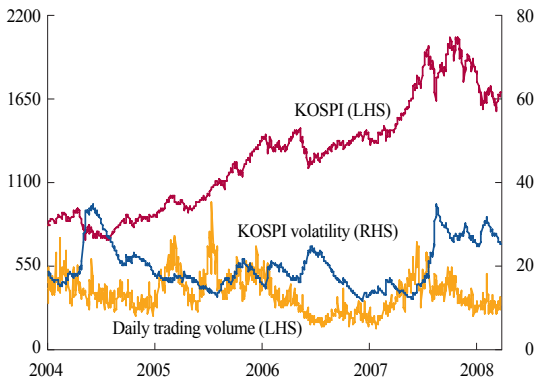
Note: 1) Volatility is calculated using the EWMA (Exponentially Weighted Moving Average) method.
Sources: Bank of Korea, KOSCOM

7 In the bond market, long-term interest rates rose sharply in late November 2007, responding to a string of massive bank bond and CD issuance, and to turmoil in the currency and interest rate swap markets.

Rates shifted to a sharp plunge from mid-December, however, in line with the subsiding of anxieties in the swap market, and with expectations of a policy rate cut.

Foreigners recorded a dramatic increase in their net buying of Korean bonds in 2007, as a result of active arbitrage trading. While this phenomenon has had positive effects on the market, in expanding the power to purchase domestic bonds, it has also had negative effects such as causing increased interest rate volatility affected by changes in foreign investors' investment patterns. This suggests a heightened possibility of overall bond market instability compared to in the past.

Stock price and volatility[1]



Note: 1) Calculated by the EWMA (Exponentially Weighted Moving Average) method.
Sources: Bank of Korea, Korea Exchange

8 In the stock market, stock prices plunged sharply from the second half of 2007, under influence of the turmoil in the international financial markets and increased foreigner net selling of Korean stocks.

Considering that the VIX, an indicator of risk aversion in the stock market, remains at a high level, and that the trading volume has

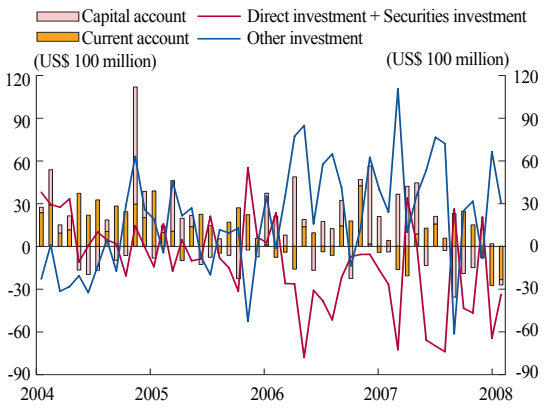
also shrunk noticeably, investment sentiment appears to be faltering.

VIX[1)]

Note: 1) Stock price volatility index for underlying assets of the KOSPI200
Sources: Bank of Korea, Korea Exchange

Steady capital inflows into equity-type funds have contributed positively to an expansion of domestic institutional investors' stock purchasing power. However, as the proportion of equity-type funds that allow frequent deposits and withdrawals, such as lump-sum funds and regular installment funds with flexible entrustment options are high, and as many asset management companies tend to pursue the same or similar investment strategies at any given time, equity-type funds seem likely to cause an increase of stock price volatility.

Balance of payments



Source: Bank of Korea

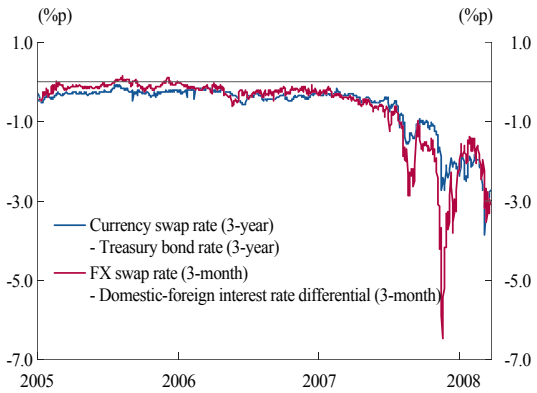
⑨ In the foreign exchange market, a predominance of demand over supply has occurred, as both the current and the capital accounts have swung into deficit.

While the net overseas borrowing by domestic banks has continued, premiums on foreign currency loans have increased rather substantially, due to the credit crunch in the

international financial markets. External debt has expanded greatly, a result of banks' increased foreign currency borrowing, driven by large forward exchange contract sales by exporters, and of expanded foreign investor purchases of domestic bonds.

The Korean won/US dollar exchange rate, which maintained a generally downward movement for most of the second half of 2007, trended upward from mid-November. This owed to the continuing large volume net stock sales by foreign investors and the increase in non-residents' net purchases of non-deliverable forwards (NDFs).

FX swap and currency swap rates

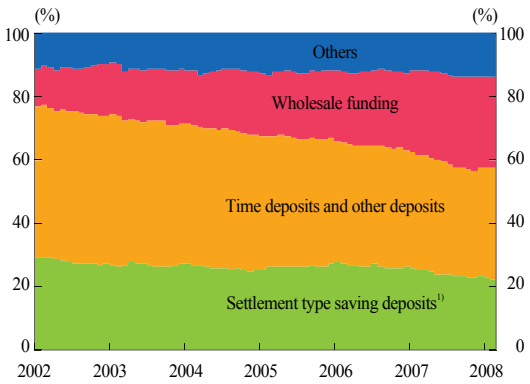


Source: Bloomberg

In the swap market, the volume of interest rate arbitrage transactions, linking the swap and bond markets has increased greatly since the second half of 2007, as FX swap rates have dropped well below interest rate differentials. The stronger linkage between the swap and the bond markets means a commensurate increase in the likelihood of imbalances caused by changes in trading behavior and market conditions in one market

spilling rapidly over to the other market, and thus bringing about instability in the financial markets as a whole.

Composition of commercial bank won-denominated liabilities by funding source



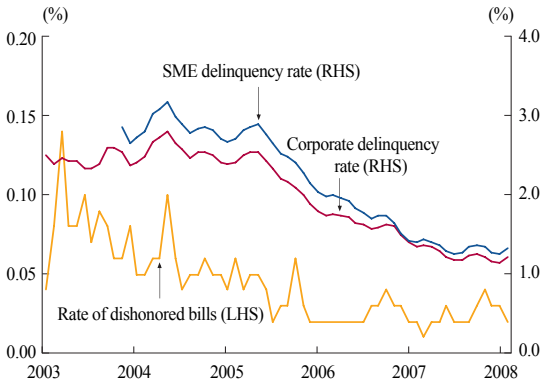
Note: 1) Demand deposits + Settlement type saving deposits
Sources: Banks' call reports

10 The banking sector, despite the weakening role of deposits as its funding base, continues to show a stable picture, thanks to overall asset soundness and maintenance of favorable profitability.

With regard to banks' funding structure, the contribution of deposits in overall funding has continued to decline and banks' reliance on wholesale funding, which is more sensitive to changes in market conditions, has increased commensurately. Following entry into force of 「Capital Market and Financial Investment Services Act」, scheduled in 2009, banks' funding bases may be further undermined by fund outflows from deposits toward the new high-return financial products authorized under the new act. Meanwhile, the flight of money from core deposits and the lengthening of loan maturities have caused banks' won liquidity ratios to drop. Banks have responded to this phenomenon by

massively increasing the volume of their high-interest long-term CD and bank bond issues, which is likely to have negative consequences on their profitability.

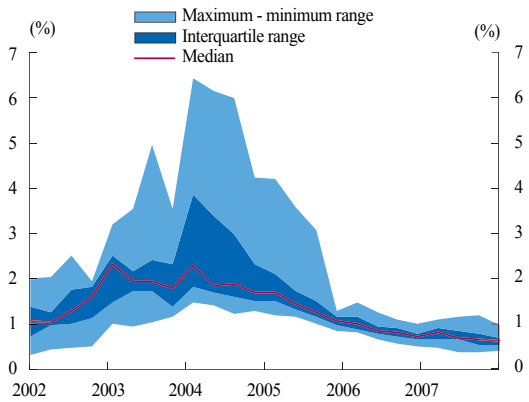
Dishonored bill ratio[1] and corporate delinquency rates[2]



Note: 1) Amount basis, including electronic-based payments
2) Three-month moving averages
Sources: Bank of Korea, Banks' call reports

In terms of credit risk, there has been a noticeable increase in banks' corporate exposure, led primarily by growth in lending to the construction and real estate sector. Soundness indicators including the delinquency rate and the dishonored bill ratio remain at healthy levels, however. The rate of increase in banks' household exposure has decelerated, meanwhile, with the ratio of substandard and below loans stabilized at low levels. Bank credit risk hence appears moderate in both the business and the household sectors. Further, considering that the ratio of loan loss provisions to NPLs (the coverage ratio) has increased as well, the banking sector's loss absorption capacity seems fairly improved.

Substandard and below household loan ratios



Sources: Banks' call reports

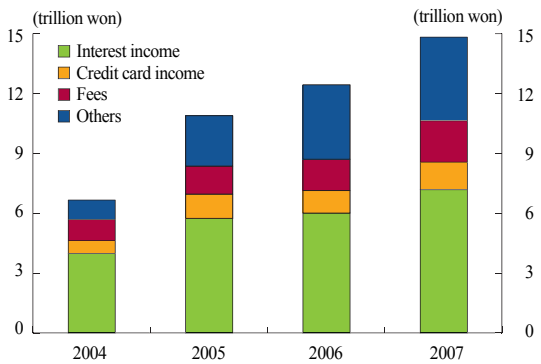
Nevertheless, there are some factors tending to cause increased bank credit risk, for example the growth in unsold new house

inventories caused by housing market slowdown outside of the capital area, and the likelihood of deteriorating corporate profitability affected by the worsened macroeconomic conditions. These factors may drive up the credit risk on banks' loans to SMEs in the construction and real estate and service sectors, which are more sensitive to changes in the business cycle.

Interest rate risk has declined with the narrowing of the interest rate sensitivity gap between long-term assets and liabilities, which are comparatively more exposed to risk in cases of interest rate volatility. Market risk has however increased somewhat, despite the reduction in bond exposure due to increased sales of short-term bonds, as bond durations have become longer and interest rate volatility has widened.

Banking sector net income has continued its upward trend, thanks to sharp increases in interest and fee incomes. Despite the large volume of net income realized, however, the average BIS capital ratio has dropped slightly.

Changes in banks' net income before taxes

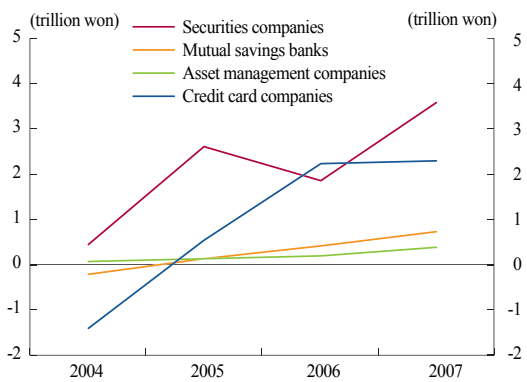


Sources: Banks' call reports

This is mainly because of an increase in risk-weighted assets caused by a greater volume of SME loans.

The upturn in profitability among domestic banks is expected to continue for the foreseeable future. However, given how the opportunities available for rapid asset expansion and the potential for additional cost savings are nearly exhausted, banks' capacities to increase their net incomes appear to have fallen relative to the past. The possibility of a decline in bank profits can also not be entirely ruled out, supposing for instance that international financial market instability were to deepen in the aftermath of the US subprime mortgage problems.

Non-bank financial institution net incomes



Source: Financial Supervisory Service

11 Business conditions among non-bank financial institutions such as mutual savings banks, securities companies, credit card companies and asset management companies have shown stable levels overall.

However, the business stability of mutual savings banks can worsen if many of their

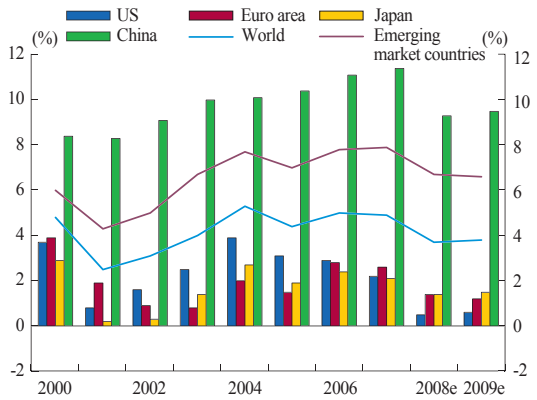
real estate project financing loans, whose volume has expanded sharply since 2006, become non-performing due to the slumping real estate activities. As for securities companies, their heavier reliance on short-term fund raising through vehicles such as CMAs has made them vulnerable to possible liquidity risk, in the event of any negative turn in market conditions. Meanwhile, the recent surge in credit card loans extended on a revolving payment basis has made credit card companies more vulnerable to developments affecting individuals' debt servicing capacities. A rapid decline in individuals' capacities would have negative consequences on both companies' profitability and their asset soundness.

Ⅱ. Changes in the environment for financial stability

1. Economic outlook at home and abroad

<Figure II- 1>

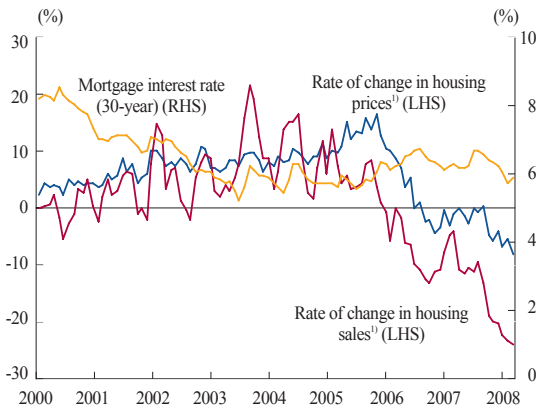
Economic growth and outlooks for selected economies



Source: IMF, World Economic Outlook (Apr. 2008)

<Figure II- 2>

US housing market trends



Note: 1) Based on existing houses (year-on-year)
Source: Bloomberg

Global economic slowdown

The world economy maintained a healthy growth rate until the third quarter of 2007, but is now facing increased downward risks to growth as the US subprime mortgage crisis spills over to the broader economy, and as oil prices continue their upward march.

US economic growth slowed sharply in the fourth quarter of 2007, affected by the deepening housing market slump and by slackness in consumption. In the Euro area, growth weakened in line with slowing investment and exports, and in Japan the economic recovery trend remains feeble.[1)] Emerging market economies, however, led by China and India, continue on their brisk tracks of growth.

The global economic downtrend is expected to continue through 2008, owing to the recessionary pressures caused by persistent high oil prices and the ongoing uncertainty in international financial markets. With growth of less than 1% forecast for the US economy, almost equally sharp economic slowdowns are expected in the Euro area and Japan and less

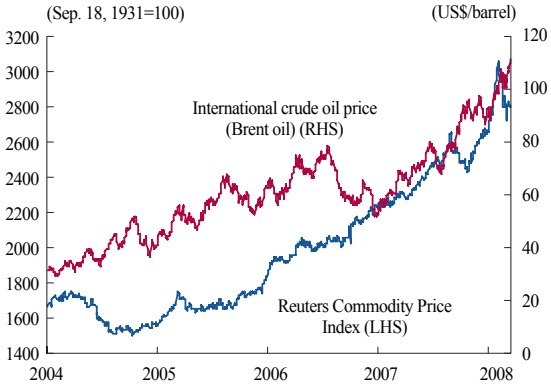
1) During the fourth quarter, a short-term increase in government consumption spending, among other factors, temporarily boosted Japanese economic growth to 0.9%, significantly higher than the 0.3% shown in the third quarter.

significant yet noticeable decelerations in emerging market countries. This should bring the rate of global economic growth down to the upper 3% range.

Despite the successive policy rate cuts and liquidity injections by many central banks in recent months, uncertainties stemming from the US subprime mortgage crisis have proven impossible to resolve. Under these circumstances, a worsening of the credit contraction or an extended delay in housing market recovery could magnify the extent of slowdown far beyond current projections. The possibility can also not be ruled out that increasing inflationary pressures, caused by the persistent current uptrend in oil prices and the prices of grains and other raw materials, might constrain economic recovery.

<Figure II- 3>

Trends of international raw material prices



Sources: Bloomberg, Reuters

Raw material prices continue upward surge

International oil prices (Brent) rose rapidly starting from late August 2007, owing to soaring demand from emerging market countries. Supply shortages stemming from production capacity limits and chronic political unrest in oil-producing nations, as well as large inflows of speculative money, also helped cause prices to skyrocket. This trend has continued into 2008, and the price of crude oil has hovered at over US$ 100 per barrel since early March. In recent months, the inflation-adjusted real price of crude oil has moved very close to the highest price seen during the second oil shock.[2] With all signs indicating that oil prices will remain at their current high levels for the foreseeable future, their negative impacts on the economy should

<Table II- 1>

Crude oil price forecasts (Brent oil)

(Period average, US$/barrel)

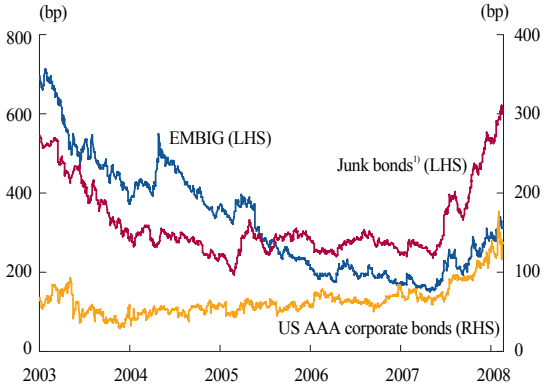
Forecasting Institute (forecast date)	2007	2008				
		1Q	2Q	3Q	4Q	Year
Result	72.5					
PIRA[1] (Apr.14)		96.9	105.7	111.3	114.8	107.2
CGES[2] (Mar.17)		94.0	100.2	86.1	76.8	90.3
CERA[3] (Mar.28)		96.5	95.8	91.5	88.5	93.1

Notes: 1) Petroleum Industry Research Associates
2) Center for Global Energy Studies
3) Cambridge Energy Research Associates

2) Converted to current prices using the 2007 US annual consumer price index, the historic high is the US$ 114.6 per barrel reached in November 1979.

<Figure II- 4>

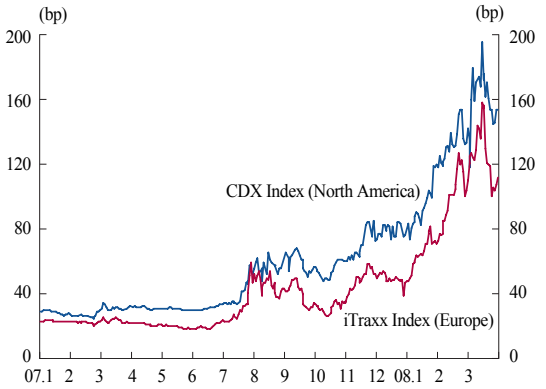
Credit spread trends



Note: 1) US corporate bonds rated BB or below
Source: Bloomberg

<Figure II- 5>

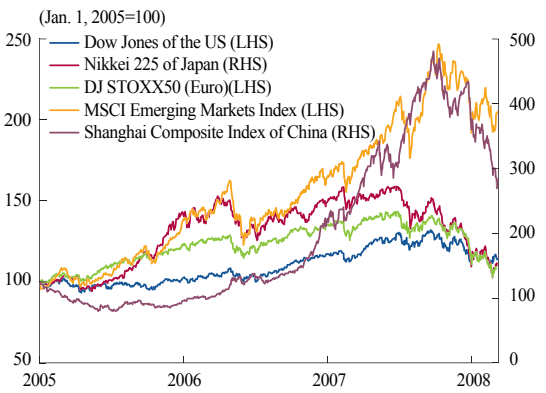
CDX and iTraxx index trends



Source: Bloomberg

<Figure II- 6>

Stock index trends in major economies



Source: Bloomberg

make themselves more fully felt soon.

The Reuters Commodity Price Index[3] has been on a steady rise since the second half of 2006, with particularly steep increases seen in the prices of wheat and corn. Poor harvests due to bad weather conditions, sharply surging demand for alternative energy sources such as bio-fuels, and the increasing emerging market demand for grain have been the principal factors contributing to this phenomenon.

Uncertainties in international financial market grow

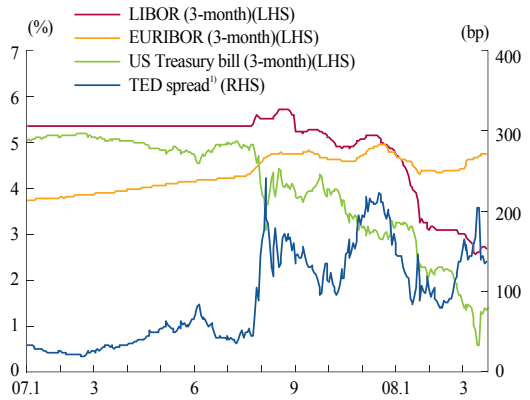
Stress caused by the subprime mortgage turmoil has spilled across the international financial market since the second half of 2007. Amid a deepening credit crunch and heightening asset price volatility in the markets,[4] financial institutions' profitability and soundness have deteriorated due to their losses on mortgage-related products. Market uncertainties have accordingly grown, and investors' risk appetites have dropped sharply.

Credit risk-related indicators have moved up steeply with the worries about the subprime mortgage meltdown. The credit spread on US junk bonds (rated BB or below) widened from 350 bps to 620 bps between August 2007 and March 2008, close to its level in the early 2000s when the IT bubble burst and the Enron scandal erupted. The CDX (North America) and iTraxx (Europe), two indices that track CDS[5] premiums on investment-grade bonds, have also

3) The index comprises the prices of 17 commodities excluding crude oil.
4) For further information, see <Box Ⅱ-1> 'Effects of the US subprime mortgage turmoil on the financial system'.

<Figure II- 7>

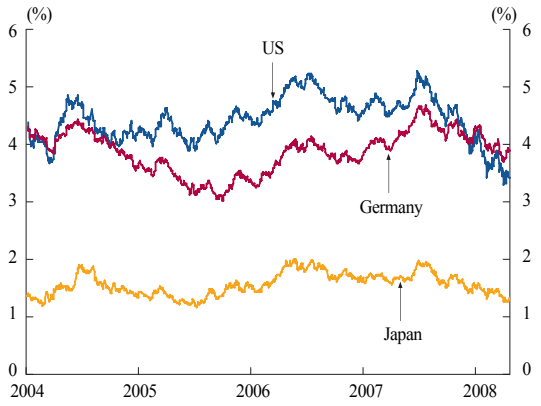
Short-term market interest rate trends



Note: 1) LIBOR (3-month) - US Treasury bill (3-month) yield
Source: Bloomberg

<Figure II- 8>

Government bond yield1) trends in select countries



Note: 1) 10-year maturity
Source: Bloomberg

continued on upward trends, with the CDX reaching a historic high of 195bps on March 13, 2008. Credit spreads on emerging market sovereign bonds (EMBIG) have widened as well, as investor appetite for risky assets dropped.

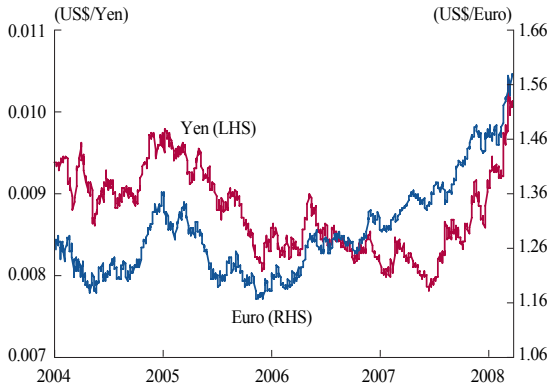
Each time a subprime mortgage-related problem has surfaced, stock prices in both developed and emerging market countries have plummeted. In August 2007, stock markets crashed in reaction to heavy losses at large investment banks and suspending of redemptions from some hedge funds. The situation worsened from November, with the devaluations of subprime mortgage-backed securities and the fears of monoline insurer collapses. As of end-March 2008, stock prices in the US were down 13.4% from their high in October 2007. Stock price declines were meanwhile more severe in emerging market countries, plunging by 16.9% (MSCI) over the same period.

A credit crunch in the short-term money market has occurred, due to increased counterparty risk following the growing losses of financial institutions. The TED spread,[6] an indicator of the level of credit risk in the short-term interbank money market, has widened dramatically since July 2007 and exceeded 200 bps by mid-March 2008. Occuring even despite the declines in short-term interbank interest rates like LIBOR(in line with major central banks' liquidity injections and policy rate cuts), this phenomenon is attributable to a significant drop in the yield on US Treasury bill(3-month maturity), affected by the flight to safe-haven assets.

5) A CDS (Credit Default Swap) is a contract that provides protection against a credit loss due to default. Accordingly, when the default risk of a borrower increases, the price of a CDS rises proportionally.
6) TED spread = LIBOR (3-month)-US Treasury bill (3-month) yield

<Figure II- 9>

USD/Yen and USD/Euro exchange rate trends



Source: FRB

<Table II- 2>

Changes in yen exchange rates versus key carry trade currencies[a)]

	1st half 2007	2nd half 2007	Jan.-Mar. 2008
US dollar	-3.3	+10.3	+12.0
Euro	-5.8	+2.4	+3.5
Australian dollar	-10.3	+7.0	+7.4
New Zealand dollar	-12.1	+11.2	+9.2
Canadian dollar	-11.7	+3.4	+15.0

Note: 1) Rates of appreciation (+), and depreciation (-) (%)
Source: Bloomberg

Yields on long-term government bonds of major countries have fallen steadily since August 2007, as concerns about global economic slowdown and investor preference for safe assets have outweighed the growing inflationary pressures due to surging raw materials prices. The yield on long-term US Treasury notes (10-year maturity) has declined more rapidly than those on government bonds from elsewhere in the world, as pessimism concerning the US economic outlook has become prevalent.

The US dollar has continued a generally weakening trend against most major currencies. Since March 2008, it has repeatedly set new record lows against the euro, and against the Japanese yen it is down 16.7% from its August 2007 high. The persisting weakness of the dollar is attributable to multiple factors, including the Fed's continued policy rate cuts to try to halt economic slowdown and the foreign asset diversification strategies adopted by emerging market countries.

While uncertainties in the global financial market increase, the yen continues to show strength against key carry trade currencies on worries of yen carry trade unwinding. The heightening of such worries could cause a further rallying of the yen, and in a vicious cycle a strong yen could in turn give yen carry trade unwinding an additional boost. Such a situation would lead to a rapid shrinking of global liquidity and worsening of financial market stability.

Amid the continuing slump in the US housing market, leveraged funds investing in high-risk assets, such as hedge funds, are going through deleveraging processes. In light of this, uncertainty in the international financial market seems likely to persist. Nevertheless, the

aggressive policy responses of central banks are easing the worries about a credit crunch, and large scale writedowns implemented by major financial institutions are helping to alleviate international market unrest.

Signs of domestic economic slowdown

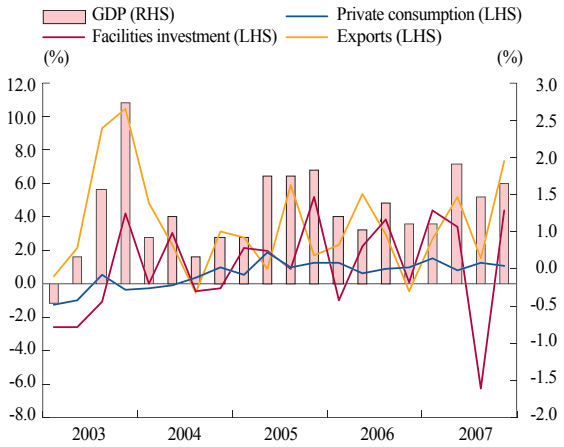
Despite buoyancy in the export sector, the domestic economy exhibits some signs of adjustment in its pace of expansion, largely due to the weakening domestic demand recovery for example in consumption and investment. With visible signs of global economic slowdown centering around the US, and a protracted period of international financial market uncertainty projected, the domestic economic outlook is likely to increase a degree of uncertainty surrounding future economic developments as its upward momentum progressively erodes.

Prices continue to show a rapid rise, mainly influenced by strong upward cost-side pressures, for example from the high oil prices. While likely to continue due to the high prices of crude oil, grains and other raw materials, this trend is expected to ease somewhat from the second half of 2008.

Current account surplus rose moderately in 2007 compared to the year before, as the goods account surplus widened thanks to solid export growth, more than compensating for the increased service account deficit caused by surging overseas travel during the year. In 2008, however, current account is projected to shift into deficit despite strong exports, as imports rise significantly due to higher prices of oil and other raw materials.

<Figure II-10>

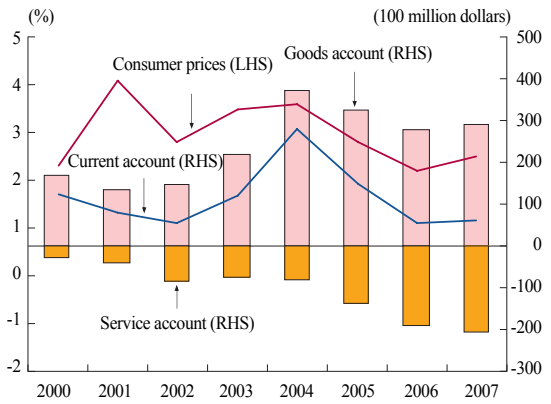
Real growth indicators in Korea[a)]



Note: 1) Seasonally adjusted; percentage changes from previous periods
Source: Bank of Korea

<Figure II-11>

Consumer prices[a)] and current account balance



Note: 1) Percentage changes from previous years
Sources: Bank of Korea, Korea National Statistical Office

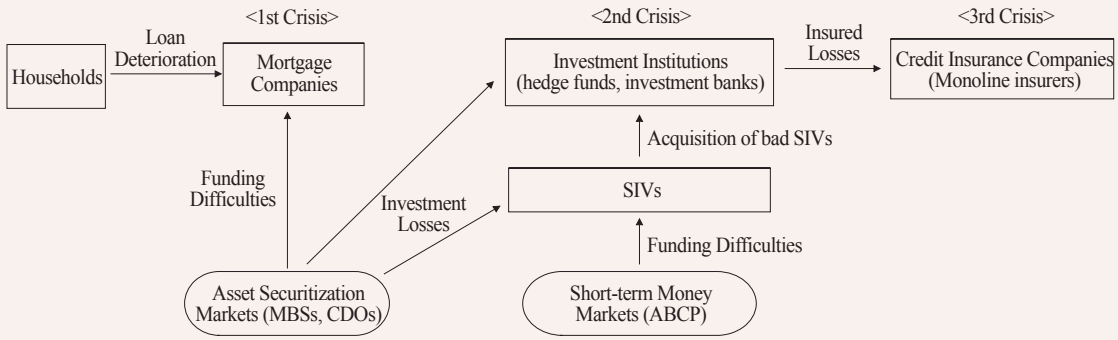
<Box II-1>

Effects of the US subprime mortgage turmoil on the financial system

The US subprime mortgage turmoil has substantially heightened uncertainties in the global financial markets, resulting in a worldwide credit crunch, increasing market volatility and causing heavy losses at large financial institutions.

The subprime mortgage turmoil first came to a head in February 2007, when amid the US housing market slowdown there was a sudden spike in the rates of mortgage loan delinquencies and foreclosures, causing some mortgage companies to file for bankruptcy and an overall mortgage market decline. Subsequently, in June and July 2007, subprime problems resurfaced with the devaluations of subprime-backed securities such as MBSs and CDOs, resulting in huge losses for hedge funds and investment banks that had invested in them. In August and September, BNP Paribas's announced suspending of redemptions on three of its hedge funds, and the withdrawal run on Northern Rock, a UK bank specializing in mortgage assets, plunged financial markets into turmoil worldwide. Later, in October, the outbreak of a liquidity crisis among SIVs[i] (structured investment vehicles) caused a severe credit crunch in the ABCP and other short-term money markets. The announcement of huge losses by large financial institutions such as Citi and UBS intensified concerns in the financial markets. In 2008, sharp downward revisions of the credit ratings of monoline insurers, which provide guarantees on CDOs and sell CDSs, in tandem with the liquidity crisis at top five US investment bank Bear Stearns, once again shook financial markets worldwide. In addition, given the downgrading of and rising delinquency rates on Alt-A mortgage loans, which indicates a spreading of credit fears beyond the subprime sector, it is clear that the subprime-related market uncertainties have not yet been resolved.

Subprime mortgage crisis propagation mechanism



The principal effects of subprime mortgage turmoil propagation on the global financial system are as follows:

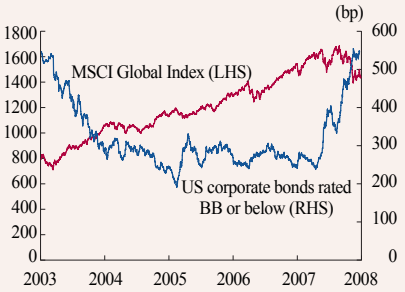
First, asset price volatility in the international financial markets has expanded in the process of investors' reevaluation of risky assets. Investor risk appetites have dropped sharply, as subprime mortgage-related risks

i) SIVs are investment entities that generate profits by investing money borrowed through issuance of short-term securities (ABCP) in long-term assets (CDOs).

have spilled rapidly over into linked financial assets and across financial institutions. Investor confidence has been especially undermined by the incomplete transfer and dispersion of credit risk[ii] through the use of securitization and derivatives. The result has been a sharp increase in asset price volatility in the financial markets, as seen for example in stock prices and credit spreads. Average credit spreads (US junk bond basis) widened to 550bps in mid-March 2008, their highest level since 2003, and global stock prices (MSCI Global Index) fell 17.3% from their level at the end of October 2007.

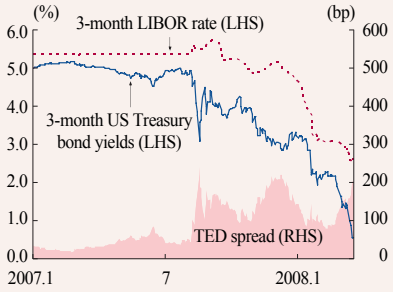
Second, the liquidity and credit risks of financial institutions have increased. The outbreak of the subprime mortgage turmoil caused the securitization and derivatives markets to shrink dramatically, and deleveraging by hedge funds and investment banks led to severe liquidity shortages for most financial institutions. Counterparty risks also increased, due to the news of credit rating downgrades of bond insurance firms and liquidity troubles at large investment banks including Bear Stearns. Reflecting this trend, the TED spread, an indicator of credit risk in the short-term money markets, soared in July 2007 and has continued its uptrend ever since. Another consequence of the heightened credit risk is that banks' lending attitudes have become more restrictive.

Credit Spread and Stock Index

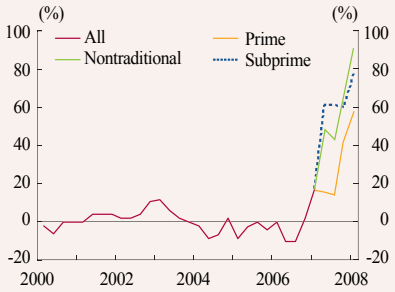


Source: Bloomberg

TED Spread



US Commercial Banks' Mortgage Lending Attitudes



Third, the profitability and soundness of financial institutions have eventually declined, as the subprime turmoil has spread across the financial sector. Financial institutions, and more particularly large investment banks, have incurred heavy losses as the values of CDOs and other subprime mortgage-related products tumbled, and write-downs of these losses have resulted in sharp drops in profitability. Further, the process of reintermediation, bringing off-balance sheet assets back onto balance sheets, has caused financial institutions' capital ratios to decline and weakened their overall financial health.

Hence, the overall effect of the US subprime mortgage turmoil on the global financial system has been a significant undermining of stability. As more extensive adjustment of mortgage loan interest rates[iii] is expected,

ii) For asset-backed securities having subprime mortgages as their underlying assets, in the event of bankruptcy or problems at the level of issuance or underwriting, buyers have the right to demand that the sellers buy them back.

iii) The OECD projects the amount of total interest rate adjustment on US mortgage loans to rise from US$ 1,115 billion (US$ 400 million for Alt-A loans, US$ 750 billion on subprime loans) in 2007 to US$ 1,365 billion (US$ 475 billion for Alt-A loans, US$ 890 billion for subprime loans) in 2008

and improvement in mortgage borrowers' debt servicing capacities seems to be delayed due to the continuing housing market deterioration, there is a possibility of international financial market strains continuing for the foreseeable future.

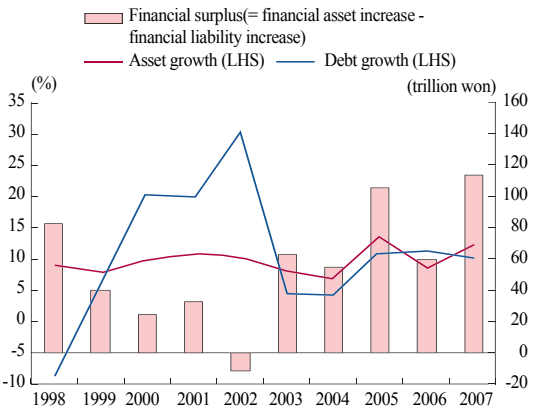
Meanwhile, central bank market operations to calm financial market turmoil have continued since August 2007, in the forms of policy rate cuts and liquidity provision. From early 2008, there have been active discussions, particularly in the US and UK, on strengthening financial supervisory mechanisms and restructuring financial stability systems to enhance financial system soundness. In March 2008, the Federal Reserve unveiled a plan for reform of the financial supervisory system, expanding the categories of institutions subject to its monitoring and surveillance programs to include investment banks, insurance companies and hedge funds. In the UK, the House of Commons Finance Committee announced in January a plan for overhauling the country's financial stability system, which consists of creating within the Bank of England a section in charge of monitoring and promotion of financial stability, and empowering the BOE's deputy governor to comprehensively oversee financial stability-related affairs, including the restructuring of insolvent banks.

Policy responses in select countries

US	<FRB> o Lowering of federal funds rate (300bps through six successive cuts) and discount rate (375bps through eight successive cuts) Before / Aug. 17, 2007 / Sep.18 / Oct.31 / Dec.11 / Jan. 22, 2008 / Jan.30 / Mar.16 / Mar.18 · Federal funds rate (%) 5.25 / 5.25 / 4.75 / 4.50 / 4.25 / 3.50 / 3.00 / 3.00 / 2.25 · Discount rate (%) 6.25 / 5.75 / 5.25 / 5.00 / 4.75 / 4.00 / 3.50 / 3.25 / 2.50 o Maturity of Discount Window loans extended from one day to up to 30 days (Aug. 17, 2007) o Introduction of Term Auction Facility (TAF; USD 310 billion provided between Dec. 2007 and Apr. 2008) o Establishment of foreign exchange swap lines worth USD 24 billion with the ECB and the Swiss National Bank (Dec. 12, 2007) o Introduction of Term Securities Lending Facility (TSLF)* (Mar. 11, 2008; USD 134 billion provided between March and April) * Under this program, the Federal Reserve auctions treasury securities to primary dealers against collateral in the form of other securities including federal agency debt and high-grade mortgage-backed securities (28-day term, up to USD 200 billion) o Announcement of liquidity provision to Bear Stearns through JP Morgan Chase (Mar. 14, 2008) o Introduction of Primary Dealer Credit Facility (PDCF) *(Mar. 16, 2008) * The program provides overnight funding to primary dealers in exchange for a range of collateral eligible for pledging in open market operations, plus investment-grade corporate securities, municipal securities, MBSs and ABSs. <Government> o Blueprint for stronger regulatory structure unveiled by Department of Treasury (Mar. 31, 2008) - Widening of the range of institutions supervised by the Federal Reserve (previously limited to depository institutions) to include investment banks, insurance companies and hedge funds - Consolidation of the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC), and dissolution of the Office of Thrift Supervision (OTS) - whose supervisory duties would be transferred to the Office of the Comptroller of the Currency (OCC) - Creation of two new agencies: a "Mortgage Origination Commission (MOC)" and an "Office of Insurance Oversight (OIO)"
UK	<Bank of England> o Three successive policy rate cuts (5.75% → 5.00% : Dec. 6, 2007, Feb. 7, 2008, Apr. 10, 2008) o Emergency liquidity supply plan for Northern Rock announced (Sep. 14, 2007), followed by announcement of guarantee of all savings deposits at Northern Rock (Sep. 17, 2007) → Government announcement of Northern Rock nationalization (Feb. 17, 2008) o Announcement of introduction of 3-month long-term repos (Sep. 19, 2007) o Increase of open market operations volume and widening of the range of eligible securities (Dec. 12, 2007) <Government/Parliament > o Financial stability system reform plan announced by House of Commons Treasury Committee and HM Treasury (Jan. 2008) - House of Commons Treasury Committee: Creation of section within the Bank of England charged with financial stability-related duties · Vesting of Bank of England Deputy Governor with comprehensive authority over financial stability-related affairs (previously overseen by the Financial Services Authority), including timely taking of corrective actions on insolvent banks and management of newly-created deposit protection fund - HM Treasury : · Strengthening of authority and power of HM Treasury and Financial Services Authority · Changing of crisis decision-making system for response to major financial market turmoil from current tri-party system, involving the Bank of England, Financial Services Authority and HM Treasury, to one centered around the HM Treasury Minister
ECB	o Policy rate kept unchanged since June 2007 (4.00%) o Establishment of foreign exchange swap lines worth USD 24 billion with the FRB and the Swiss National Bank (Dec. 12, 2007) o Introduction of the TAF (Term Auction Facility) program (USD 70 billion provided between Dec. 2007 and Apr. 2008) o Additional liquidity supply to support short-term money markets (6-month term; Apr. 2, 2008; EUR 25 billion)

<Figure II-12>

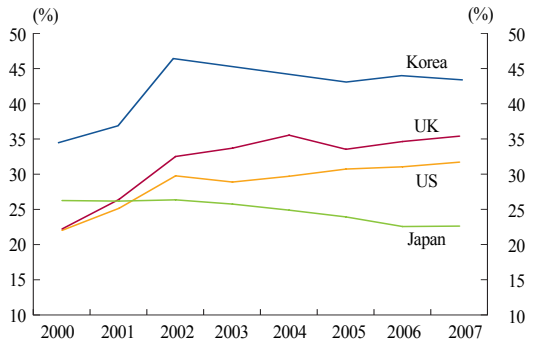
Household financial surplus and asset and liability growth[1)2)]



Notes: 1) Percent changes from ends of previous years
2) Financial assets and liabilities exclude trade credits and other miscellaneous non-interest-bearing financial assets and debts.
Source: Bank of Korea

<Figure II-13>

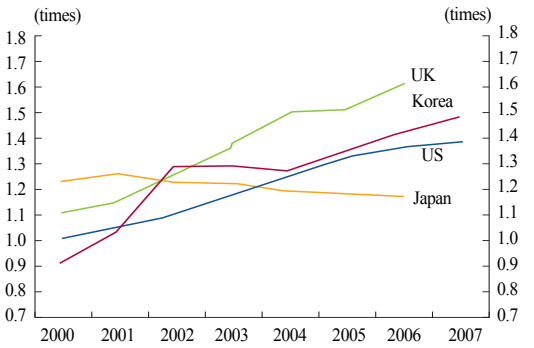
Household debt-to-asset ratios in select countries[1)]



Note: 1) The 2007 data are as of the year-end for Korea and the US, and as of the 3rd quarter for Japan and the UK.
Sources: Flow-of-funds statistics of the respective countries

<Figure II-14>

Household financial debt-to-disposable income ratio trends[1)2)]



Note: 1) Year-end-basis
2) Trade credits and non-interest-bearing assets and debts such as miscellaneous financial assets and debts are excluded.
Sources: National accounts and flow of funds statistics of the respective countries

2. Debt servicing capacity of the household sector

Households' debt servicing capacity weakens

In spite of a moderate slowdown in the growth of household debt, the overall debt servicing capacity of the household sector appears to have fallen, given the rising ratio of debt to disposable income and the increased interest payment burden due to the rise in interest rates.

Households' capital gearing ratio, an indicator of their ability to repay financial debts without needing to liquidate real assets, dropped slightly at the end of 2007, to 43.3% from 44.0% the year before.[7)]

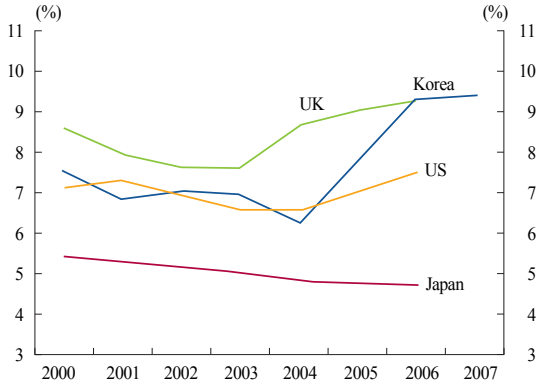
This was mainly due to the deceleration in the growth of household debt, from 11.4% in 2006 to 10.4% in 2007, while household financial assets increased 12.2% during the same period, thanks to a rise in stock prices. As financial assets grew faster than financial debt, the financial surplus of the household sector (asset growth - debt growth) widened during this period.

However, the debt-to-income ratio, an indicator of households' capacity to repay debt with disposable income, continued to climb in 2007, as debt expanded at a rate faster than disposable income. The income gearing ratio for the household sector, which measures the interest rate payment burden, also climbed

7) The debt-to-asset ratio of the Korean household sector, although below its level in 2006, is still well above the levels of the US (31.8%) and the UK (35.4%). This is likely due to the preference among Korean households for real estate over financial assets.

<Figure II-15>

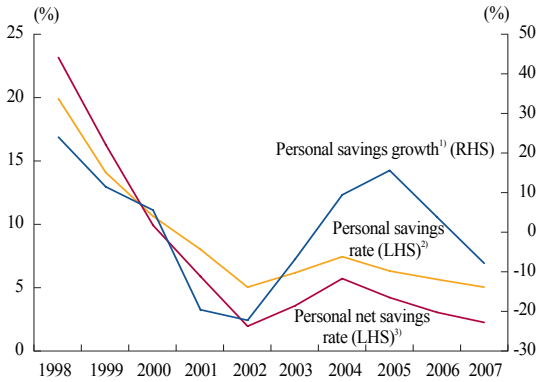
Household interest payment-to-personal disposable income ratios



Sources: National accounts of the respective countries

<Figure II-16>

Household savings rates and savings growth



Notes: 1) The rate of personal savings growth shown is a 3-year moving average.
2) Personal savings rate = (Personal savings/Gross national disposable income) × 100
3) Personal net savings rate = [Personal net savings/(personal net adjusted disposable income + adjustment for change in net equity of households in pension funds)] × 100

Source: Bank of Korea

<Table II- 3>

Compositions of personal sector assets in select countries[1]
(End-2007)

(%, times)

		Korea	US	UK
Share of Financial assets (%)	Bank deposits, cash	42.9	13.0	26.3
	Insurance, pensions	22.8	31.0	54.5
	Bonds	12.4	9.8	0.7
	Stocks	21.2	42.7	14.9
	Others	0.8	3.5	3.5
Deposits/Loans (times)		1.00	0.44	0.74

Note: 1) Data for the US and UK are as of the end of the third quarter 2007.
Source: Bank of Korea

moderately in line with the increase in debt and the rise in interest rates.[8)]

Meanwhile, the debt service ratio among households with home mortgage loans from commercial banks increased for the second consecutive year, registering 20.2% in December 2007.[9)] This suggests a worsening of cash flows compared to incomes, especially among households with excessive debt, and heavier debt repayment burdens for them.

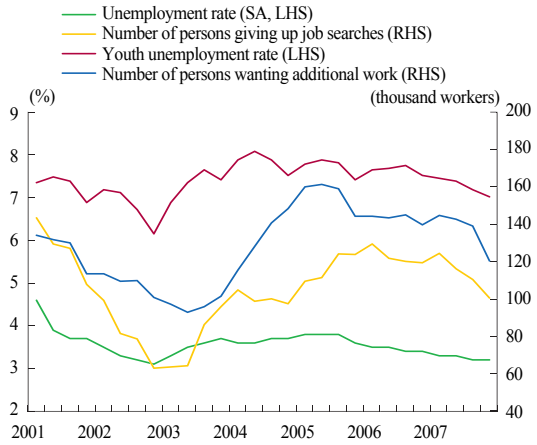
The rate of personal net savings,[10)] an indicator of the savings tendency among households, fell to 2.3% in 2007, continuing its trend of decrease begun in 2005. This suggests a decline in the possibility of improvement in households' future debt repayment abilities.

It should be noted, however, that the financial assets of Korean households consist much less of insurance policies or pension plans as in major countries in the world, and more of current assets such as bank deposits and cash. They can therefore be more readily used for debt repayment. Also, since the ratio of deposits to loans is higher among households in Korea than those in major countries, the effect of a rise in interest rates on the interest payment burden is generally less for Korean households.

8) The average annual CD rate, used as a reference for readjustment of housing finance loan rates, stood at 5.16% in 2007 – up 0.68%p from 2006 (4.48%).
9) For more information on this topic, see <Box II-2> 'Assessment of the debt servicing burden of home mortgage loan-holding households.'
10) The rate of net savings in the personal sector is calculated by dividing the portion of personal disposable income left unspent by the sum of personal net adjusted disposable income and the adjustment for changes in net equity of households in pension funds. The rate of personal net savings is a major indicator of the savings tendency.

<Figure II-17>

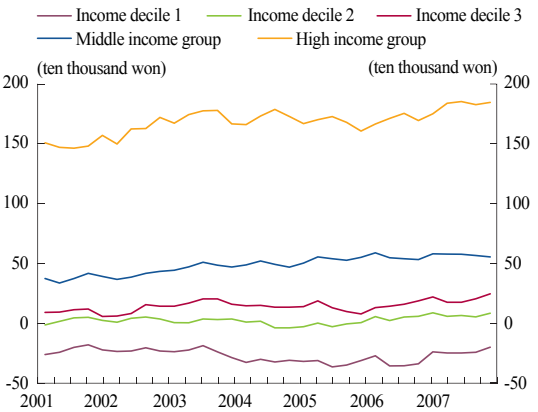
Unemployment and Underemployment Indicators[a)]



Note: 1) All time series except the unemployment rate are smoothed with 3-quarter moving averages.
Source: Korea National Statistical Office

<Figure II-18>

Household balance sheets by income level[a)2)]



Notes: 1) 3-quarter moving averages of the monthly average balance sheets among urban working households
2) Simple average household balance sheets for the middle income (deciles 4 to 7) and high income (deciles 8 to 9) groups
Source: Korea National Statistical Office

<Table II- 4>

Rates of credit rating change among household borrowers[a)]

(%)

	Percentage of upgraded borrowers (a)		Percentage of downgraded borrowers (b)		Rate of change (a-b)	
	2006	2007	2006	2007	2006	2007
Investment grade	23.5	26.2	22.8	18.0	0.7	8.2
Speculative grade	5.7	6.8	4.1	2.2	1.6	4.6
Overall	29.2	33.0	26.9	20.2	2.3	12.8

Note:1) The rate of credit rating change (= [(Number of borrowers with upgraded credit rating − Number of borrowers with downgraded credit ratings)/ Total number of borrowers] × 100) provides a measure of the extent of improvement (+) or worsening (-) in the credit ratings of borrowers, by comparing the percentages of upgraded and downgraded borrowers.
Source : Bank of Korea

Credit situation of vulnerable households improves slightly

Amidst signs of improving balances among low-income households, the ratio of upward credit rating adjustment among speculative-grade borrowers increased during 2007, pointing to a small but real easing of credit conditions among the most vulnerable segments of the Korean household sector.

With the decrease in the unemployment rate in 2007, other employment indicators related to vulnerable segments of the household sector, such as the numbers of discouraged workers giving up on job searches and that of workers wanting additional work,[11)] also improved somewhat.

The disparity between high and low income households in terms of their balance sheets widened. However, the sizes of the deficits of households in the lowest income group (income decile 1) declined, while small increases were seen in the surpluses of households in the second and third lowest deciles.

With regard to the changes in household borrower credit ratings in 2007, among speculative-grade borrowers (the 7^{th} ~ 10^{th} grades) the ratio of upgraded ratings was 4.6% points higher than that of downgraded ratings, indicating year-on-year improvement in the credit ratings of the most vulnerable segments.

11) Refers to workers employed less than 18 hours a week, who wish to work more hours.

<Box II-2>

Assessment of the debt servicing burden of home mortgage loan-holding households

1. Background

The effects of an interest rate increase on the debt servicing capacity of the household sector, at a time when there has been no real decline in the staggering volume of household debt, are bound to be negative. Assessment of indebted households' vulnerability to such an event has been limited in accuracy so far, as evaluation of households' debt servicing capacities has been based mostly on macro-data such as the national accounts and flow-of-funds statistics.

To more precisely measure the debt servicing capacities of indebted households, the Bank of Korea collected micro-data from six commercial banks[i] with track records of handling large home mortgage loan volumes. Data included the volumes of borrowing, income levels, maturity statuses and volumes of principal and interest payments. Using this data, the debt service ratios (DSRs)[ii] of home mortgage loan-holding households were calculated, and their debt repayment burdens in line with their income levels and loan sizes were assessed.

2. Assessment of debt servicing burdens of indebted households

The DSR of home mortgage loan-holding households[iii] has been on a steady rise, climbing from 15.3% in December 2005 to 19.3% in December 2006 and 20.2% in December 2007. This rise in DSR has been due, on the one hand, to the continuous growth in volume of home mortgage loans, and on the other to the overall rise in interest rates, which has led loan interest rates to increase as well.

Indicators of debt repayment burdens among home mortgage loan-holding households[1]

	DSR(%)[2]	Interest payments/ Annual income (%)	Outstanding loan balance/ Annual income (times)	Loan amount per borrower (ten million won)
Dec. 2005	15.3	10.2	1.76	6.9
Dec. 2006	19.3	12.0	1.95	8.2
Dec. 2007	20.2	13.2	1.96	8.3

Notes: 1) Based on home mortgage loan-holding households with annual incomes of 20 to 100 million won
2) Ratio of loan principal and interest to household income
Source: Call reports of six banks (KB, Woori, Shinhan, Hana, SC First and NACF)

The rise in interest rates has also driven up the ratio of households' interest payments to income (calculated in December of every year), from 10.2% in 2005 to 12.0% in 2006 and 13.2% in 2007.

Examination of the debt servicing burden in terms of income level indicates that the lower the income of an indebted household is, the higher its debt servicing burden. The DSR among households earning 20 to 50 million won annually (the low income group) was 22.3% (Dec. 2007), compared to 15.7% for households

i) The six banks are KB, Woori, Shinhan, Hana, SC First and NACF, which together account for 85.2% of all home mortgage loans underwritten by Korean banks (as of end-2007).
ii) The debt service ratio is a measure of a household's ability to meet its debt repayment obligations without liquidating real assets: DSR = [(Loan principal + Interest)/Disposable income] × 100.
iii) Households earning 20 to 100 million won in annual income and having home mortgage loans outstanding (with one of the above-mentioned six banks).

(hundred million won)

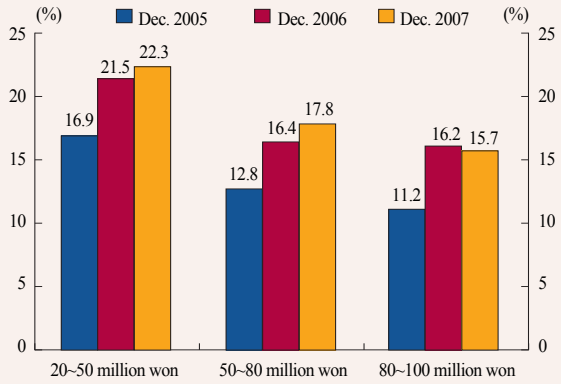
earning 80 to 100 million (the high income group); in other words, it was 6.6% points higher. This gap appears to owe to the comparatively higher interest rates charged on loans to low income households, based upon their lower credit ratings owing to their higher loan-to-income ratios. Among low income households, the average loan balance is 2.17 times their annual income, substantially greater than that (1.52 times) for high income households. The average interest rate paid stands at 6.79% among the former – 0.15% points higher than that (6.64%) paid by the latter. This also makes the proportion of annual interest paid to income significantly higher for low income households (at 14.7%) than for high income households (10.1%).

A look at the data in terms of loan size, meanwhile, shows that the larger a household's loan value, the higher its principal and interest payment burden. The average DSR among households holding between 150 and 200 million won in home mortgage loans amounted to 35.7%, far above the overall average of 20.2%. The outstanding loan balance among these households was 3.62 times their annual incomes, a figure which again far surpassed the overall average (1.96 times annual income). The DSR among households with loans of 50 million won or less, meanwhile, was only 7.3%, drastically lower than the overall household average.

3. Overall assessment

The DSR among home mortgage loan-holding households stood at 20.2% in December 2007, well below the generally-accepted upper limit for household debt servicing capacity of 40%.[iv] Given the deceleration in the rate of lending increase seen since early 2008, and the low likelihood of any

Debt service ratios (DSRs) by income level



Debt servicing burden indicators by income level
(As of Dec. 2007)

Annual income	Loan amount per borrower (ten million won)	Weighted average loan interest rate (%)	Interest payment/Annual income (%)	Outstanding loan balance/ Annual income (times)
20 ~ 50 million won	7.2	6.79	14.7	2.17
50 ~ 80 million won	10.6	6.70	11.5	1.71
80 ~ 100 million won	14.0	6.64	10.1	1.52
Average	8.3	6.75	13.2	1.96

Source: Call reports of six banks (KB, Woori, Shinhan, Hana, SC First and NACF)

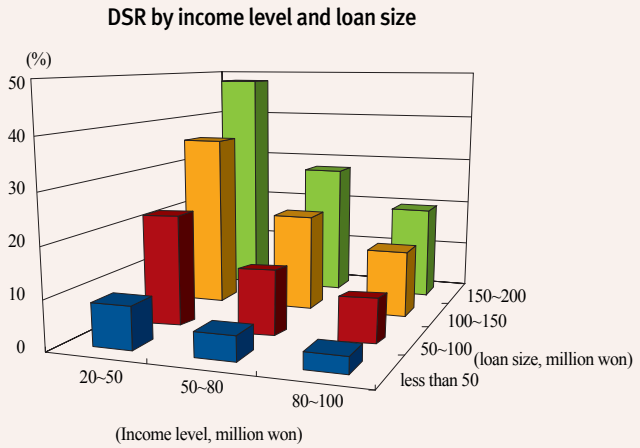
Debt servicing burden indicators by loan size[1)]
(As of Dec. 2007)

Loan amount	DSR (%)	Outstanding loan balance/Annual income (times)	Interest payment/ Annual income (%)
less than 50 million won	7.3	0.66	4.6
50-100 million won	18.1	1.73	11.8
100-150 million won	27.4	2.71	18.2
150 -200 million won	35.7	3.62	24.1
Overall	20.2	1.96	13.2

Note : 1) Based on home mortgage loan-holding households with an annual incomes of 20 to 100 million won

iv) The DTI (debt-to-income) ratio set by the Financial Supervisory Service

significant drop in home values, most households should normally be able to meet their principal and interest payment obligations without great difficulty.



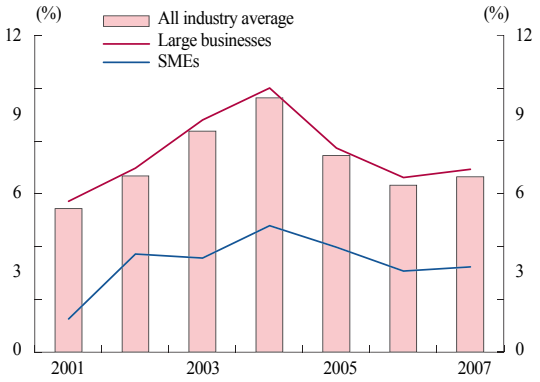
Notwithstanding this, low income households servicing excessively large loan values relative to their incomes appear to have become more vulnerable than before to external shocks such as interest rate hikes. As indicated by the graph, the DSR among households earning 50 million or less per year and with home mortgage loan values of 100 million won or more[v] is extremely high, ranging anywhere between 35% and 48%. These households are more than likely to struggle to meet their principal and interest payment obligations, which put sizeable pressures on their cash flows. It is always possible, therefore, that any sudden drop in home prices or deterioration in employment conditions during an economic slowdown could cause a spike in loan delinquencies among these excessively indebted, low-income households. This could eventually drag the overall household sector down along with them, and damage asset soundness of banks.

It must be noted, however, that the debt servicing burdens measured via this analysis may not correspond exactly to the actual debt servicing burdens of Korean households, as the outstanding loan balances used for estimation do not take into account other loans households may have with non-banking financial institutions. At the time of this analysis, moreover, information on household income variables, such as the number of wage earners in a household or the existence of income transfers between family members, was unavailable.

v) Households having residential mortgage loans of over 100 million won and earning 50 million won or less in annual income accounted for 12.5% of all household borrowers.

<Figure II-19>

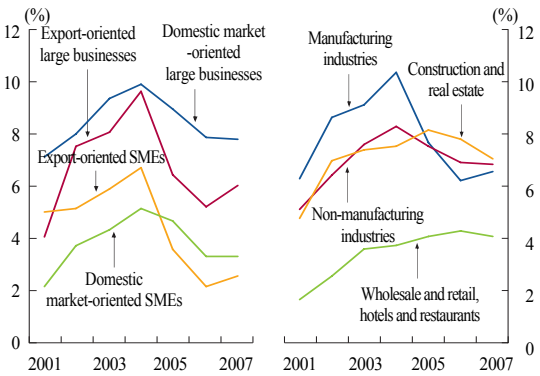
Trends of operating income-to-sales ratios



Sources: KIS-Value, Bank of Korea

<Figure II-20>

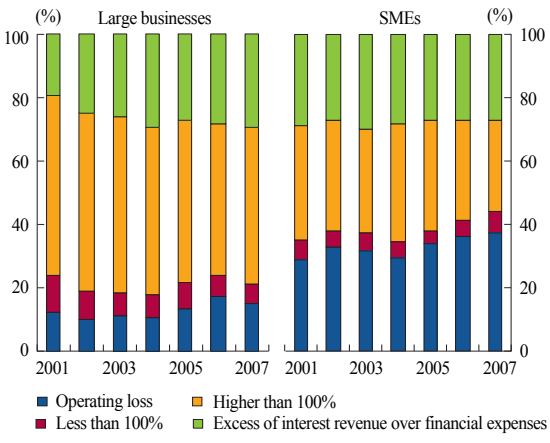
Comparison of operating income-to-sales ratios between export-oriented and domestic market-oriented businesses, and among industry sectors



Sources: KIS-Value, Bank of Korea

<Figure II-21>

Distribution of net interest compensation ratios



Sources: KIS-Value, Bank of Korea

3. Debt servicing capacity of the business sector

Profitability improves

In 2007, the operating income-to-sales ratio of listed firms[13] improved generally, climbing to 6.7% from 6.3% in 2006. However, the polarization of profitability between export-oriented and domestic market-oriented businesses and among industry sectors appeared to persist.

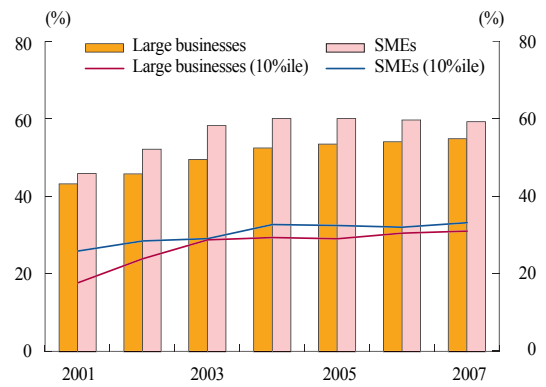
In terms of business size, the operating income-to-sales ratio of large businesses increased, bolstered by the upturn in the electronics, steel, automotive and shipbuilding-related sectors, while the ratio also rose slightly for small and medium-sized enterprises (SMEs), led by those in the booming industrial sectors.

By export status,[14] the operating income-to-sales ratio dropped among domestic market-oriented businesses, due to poor performance in the telecommunication equipment and other IT hardware sectors. The ratio rose quite significantly for export-oriented businesses, however, due to the appreciation of the Korean won and the sharp increase in raw materials prices, helped by a solid uptrend in the global economy and other favorable external conditions. Looking at the ratio in the different industrial sectors, we find that it improved in manufacturing, thanks to the briskness of exports, but declined in the non-manufacturing industries,

13) Those listed on the Korea Exchange (based on KIS-Value data as of March 31, 2008), with financial institutions excluded.
14) Export-oriented businesses are those whose exports account for half or more of their total sales. The others are referred to as domestic market-oriented businesses here.

<Figure II-22>

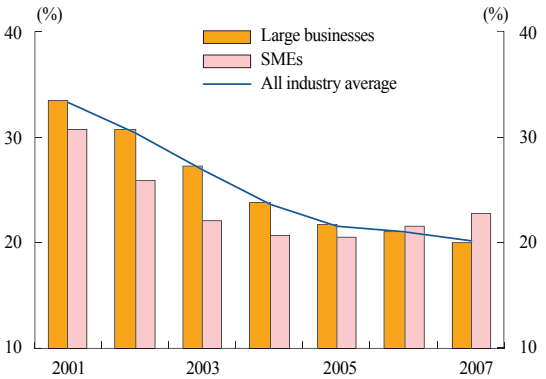
Trends of stockholders' equity-to-total assets ratios



Sources: KIS-Value, Bank of Korea

<Figure II-23>

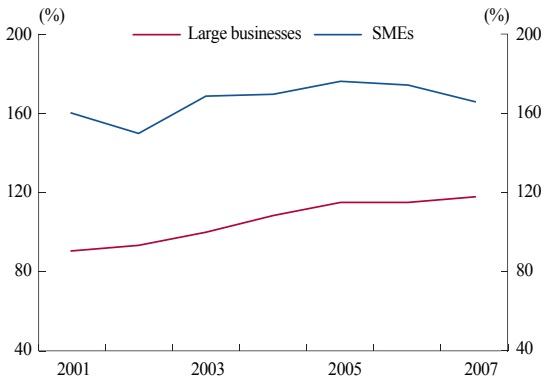
Trends of dependence on borrowings



Sources: KIS-Value, Bank of Korea

<Figure II-24>

Trends of current ratios



Sources: KIS-Value, Bank of Korea

affected by the sluggish real estate market.

In 2007, the proportion of SMEs with net interest coverage ratios[15] less than 100%, in other words whose operating incomes were insufficient for covering their net interest expenses, grew to 43.9% – from 41.5% in 2006. That result owed to the increasing number of underperforming SMEs, amid widening disparities in profitability between export-oriented and domestic market-oriented businesses and among industry sectors, while at the same time interest rates rose.

Financial status and liquidity enhance

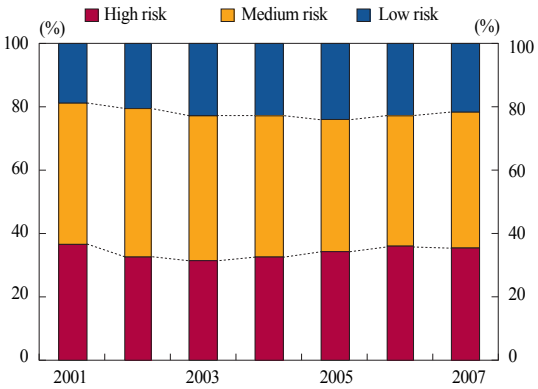
The capacity to withstand external shocks remained sound, as businesses maintained their ratios of stockholders' equity to total assets[16] at safe levels, while their profitability was generally improved. The average ratio of stockholders' equity to total assets was about 60% among both large businesses and SMEs, and increased slightly even among businesses in the bottom 10 percentile.

The dependence of large businesses on borrowings[17] continued to trend downward, due to their enhanced profitability. That of SMEs continued to rise, meanwhile, due to their tendencies toward advance procurement of funds needed for operations. A higher dependence on borrowings makes such SMEs more vulnerable in terms of their debt service burdens, as interest rates rise or as sales performances weaken.

15) Net interest coverage ratio = operating income / net interest expenses (Net interest expenses = interest expenses - interest income)
16) Ratio of stockholders' equity to total assets = stockholders' equity / total assets
17) Dependence on borrowings = total borrowings / total assets

<Figure II-25>

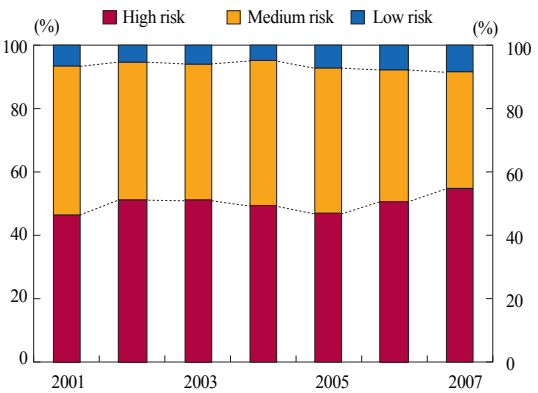
Distribution of large businesses by credit risk rating



Sources: KIS-Value, Bank of Korea

<Figure II-26>

Distribution of SMEs by credit risk rating



Sources: KIS-Value, Bank of Korea

<Table II- 5>

Transition Matrices

(large businesses) (%)

2006 \ 2007	High risk	Medium risk	Low risk
High risk	79.9	19.0	1.1
Medium risk	14.7	74.0	11.3
Low risk	1.7	23.7	74.6

(SMEs) (%)

2006 \ 2007	High risk	Medium risk	Low risk
High risk	83.4	16.2	0.4
Medium risk	29.7	62.1	8.2
Low risk	7.4	38.3	54.3

Sources: KIS-Value, Bank of Korea

The current ratio,[18] a measure of short-term solvency, remained stable. It improved over the year before among large businesses, and remained at a relatively high level among SMEs.

A slight increase in high-risk SMEs

Analysis with the BOK's new corporate credit risk assessment model[19] indicates that among large businesses, the proportion of high-risk firms has been steadily declining. Meanwhile, the proportion of high-risk SMEs has been growing year to year, due principally to the deteriorating profitability in industrial sectors sensitive to economic cycles – such as construction, real estate, wholesale and retail, and restaurants and hotels.

Looking at their transition matrices, SMEs show a lower possibility of improvement in credit rating than large businesses. The possibility of an SME rated to have low risk retaining its current rating also proves smaller than that for a large business with the same rating.

Its enhanced profitability and sound financial status, in tandem with abundant liquidity, suggest that debt servicing capacities in the business sector remain sound. Notwithstanding this, there is widening polarization among SMEs, between export-oriented and domestic market-oriented businesses and also among industry sectors. This, as well as the growing dependence on borrowings, could work to undermine operational stability at some of the most vulnerable businesses if economic conditions were to deteriorate.

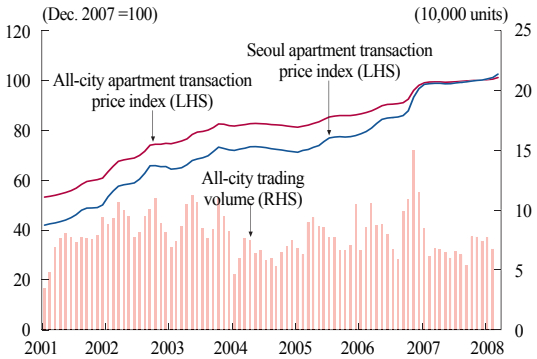
18) Current ratio = current assets / current liabilities

19) For more details, see 'The new corporate credit risk assessment method' in <Box II-3> of Financial Stability Report No. 10 (Oct. 2007).

4. Real estate market

<Figure II-27>

Apartment transaction price indices and trading volume



Sources: Kookmin Bank, Korea Land Corporation

<Table II- 6>

Apartment transaction prices[1] in Seoul Gangnam, Gangbuk areas

(%)

	4Q 2006	1Q 2007	2Q	3Q	4Q	1Q 2008
Gangbuk[2]	13.7	3.8	0.9	1.4	2.0	4.5
Gangnam[3]	11.8	1.2	-0.8	0.3	-0.2	0.7

Notes : 1) percentage changes from the last months of the previous quarters
2) Fourteen districts located north of the Han River
3) Eleven districts located south of the Han River
Source: Kookmin Bank

<Table II- 7>

Apartment transaction prices[1] by size

(%)

	4Q 2006	1Q 2007	2Q	3Q	4Q	1Q 2008
Small[2]	8.0	1.8	0.3	0.9	0.9	1.9
Mid-size[3]	7.7	1.3	-0.2	0.3	0.1	0.6
Large[4]	7.2	0.9	-0.6	-0.1	-0.5	0.0

Notes : 1) percentage changes from the last months of the previous periods
2) Total habitable areas of less than 62.8㎡
3) Total habitable areas of 62.8㎡ and more, but less than 95.8㎡
4) Total habitable areas of 95.8㎡ and more
Source: Kookmin Bank

Upward housing price trend contains

The upward trend of housing prices has been contained, relatively. All-city apartment transaction prices inched incrementally higher (compared to the last months of the previous periods) during the third and fourth quarters of 2007 – by 0.5% and 0.4%, respectively. Once into the first quarter of 2008, their rate of growth accelerated slightly to 1.0%. The apartment trading volume shrank steadily for most of 2007, due to the strengthening of real estate-related tax laws and mortgage lending rules. Starting from October, however, the volume returned to an uptrend, with transactions in the low end segment of the housing market becoming brisk.

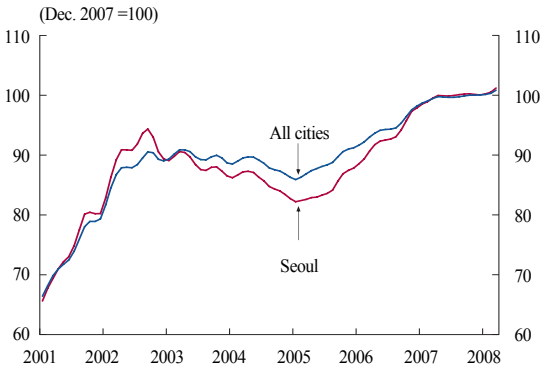
The rate of increase in housing prices has seen more widely differing movements than previously, depending upon the region and the size of the property concerned. Prices of apartments in the southern (Gangnam) area of Seoul and in the provinces have been downward stabilized since the first quarter of 2007. In the northern (Gangbuk) area of Seoul, on the other hand, they have exhibited a steeply rising trend, fueled among other factors by expectations of extra price gains from local development projects. The momentum begun from the third quarter of 2007 brought the rate of price increase in this area to 4.5% in the first quarter of 2008.

Looking at the market in terms of housing size, transaction prices for medium and large sized apartments have remained stable since the beginning of 2007, thanks largely to tighter mortgage lending

standards and stricter enforcement of tax laws related to property ownership. Meanwhile, small sized apartment transaction prices rose 0.9% in the fourth quarter of 2007 and 1.9% in the first quarter of 2008, bolstered by real effective demand growth related to home moving and marriages.

<Figure II-28>

Apartment lease deposit indices

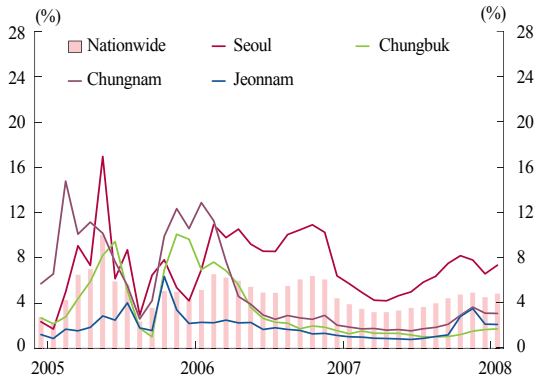


Source: Kookmin Bank

The level of lease deposits, after remaining generally stable in the second half of 2007, has edged higher in 2008 on seasonal home relocation demand. The rate of increase in lease deposits (changes from the last months of the previous periods) among Seoul area apartments accelerated from 0.2% in the second half of 2007 to 1.2% in the first quarter of 2008. For apartments in the northern (Gangbuk) area of Seoul, leases have been appreciating particularly rapidly, due to rising relocation demand caused by small housing redevelopment projects. After going up 0.4% in the fourth quarter of 2007, they increased by 1.7% in the first quarter of 2008.

<Figure II-29>

Land price fluctuations[a] by region



Note: 1) Annualized rates of increase compared to the previous months
Source: Korea Land Corporation

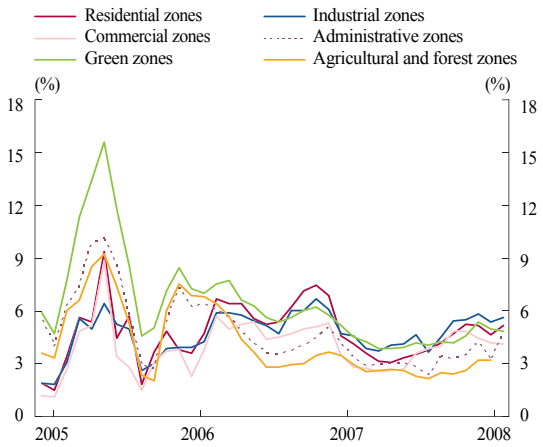
Land prices on the rise

Land prices surged moderately from the second half of 2007. The rate of increase in prices of land nationwide (changes from previous months; annual increase rate basis) accelerated from 3.2% in May 2007 to 4.9% in December, to remain high well into 2008 (4.8% in February).

By region, the rate of land price increase in Seoul and the surrounding metropolitan area (with higher land demand due to on-going New City and Seoul New Town development projects) is rising at a significantly higher rate than the national average. Land prices in other areas, meanwhile, are registering rates of increase below the national average.

<Figure II-30>

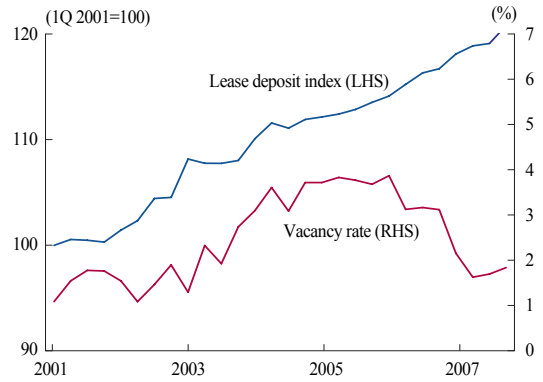
Land price fluctuations[a] by land usage



Note: 1) Annualized rates of increase compared to the previous months
Source: Korea Land Corporation

<Figure II-31>

Office lease deposit index and vacancy rate in Seoul



Source: Korea Appraisal Board

By land usage, land prices grew at comparatively faster rates in 2007 in industrial zones, owing to heightened demand, and in residential and green zones, mostly due to expectations of extra price appreciation from anticipated development projects.

Moderate appreciation of commercial real estate

The prices of commercial properties have been on a mild upward trend, with the rate of increase in lease deposits for offices in Seoul (changes from the last months of the previous periods) increasing from 0.2% in the third quarter of 2007 to 1.4% in the fourth quarter.

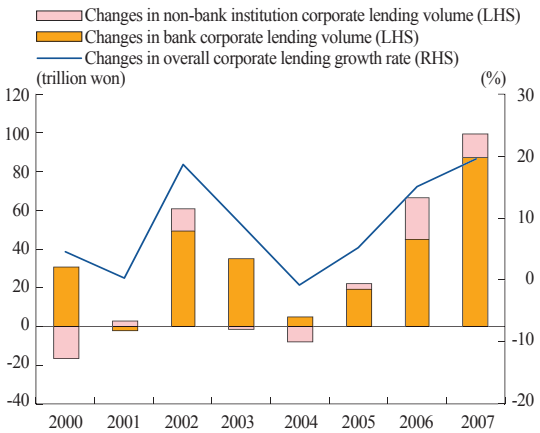
The vacancy rate among offices in Seoul has remained generally low, increasing only incrementally between June and December 2007 – from 1.6% to 1.8%. This phenomenon, occurring despite the expansion in supply after completion of numerous commercial construction projects during the period, is explained by continuing new demand as the economic recovery was gathered further pace.

Ⅲ. Stability of the financial market

1. Lending market

<Figure III- 1>

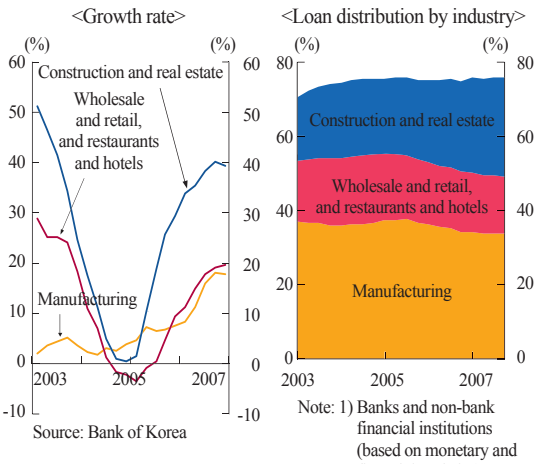
Corporate lending trends



Source: Bank of Korea

<Figure III- 2>

Lending trends by industry



Source: Bank of Korea

Note: 1) Banks and non-bank financial institutions (based on monetary and financial statistics)

Source: Bank of Korea

Corporate lending continues to trend up

Corporate lending increased by 99 trillion won in 2007, a year-on-year rise of 19.5%. Broken down by type of financial institution, banks lent 86.8 trillion won, nearly 90% of corporate lending. The non-bank financial institution contribution meanwhile amounted to only 12.2 trillion won. This steep upward trend in corporate lending, especially noticeable among banks, has also persisted into 2008.

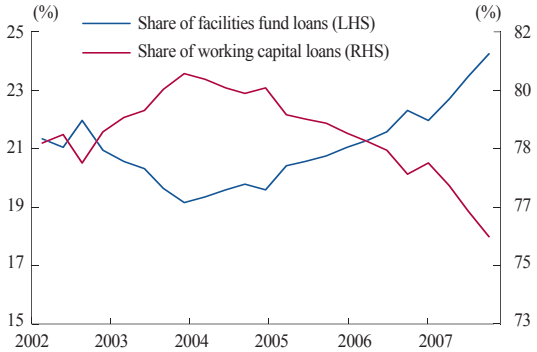
By company size, the volume of loans to SMEs continued to climb, influenced by the tightened housing finance loan regulations and the unabated drive for asset expansion among banks. The volume of loans to large corporations, after declining in 2006, resumed its uptrend during 2007, as capital demand related to M&As and facilities investment increased in this segment, and the new credit guarantee fund contribution requirement[1)] drove companies away from private placement bonds toward bank loans.

By industry, significant growth was seen in lending to the construction and real estate sectors, while the volumes of loans to the wholesale and retail,

1) Following amendment (proclaimed on June 4, 2007) of the Enforcement Decrees to the Credit Guarantee Fund Act and the Technology Credit Guarantee Fund Act, contribution to these funds became mandatory from July 1, 2007 – even for private placement bonds and CP issues intended for purchase by banks.

<Figure III- 3>

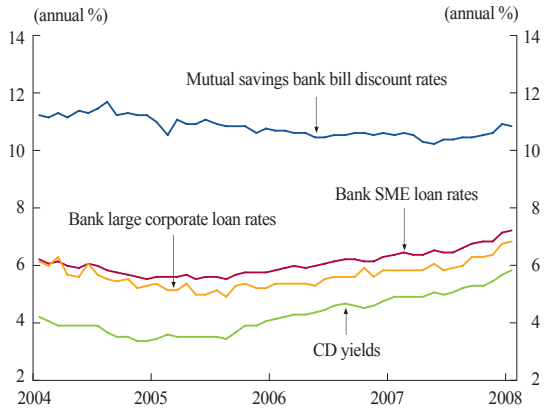
Facilities fund loans in total bank corporate lending



Source: Bank of Korea

<Figure III- 4>

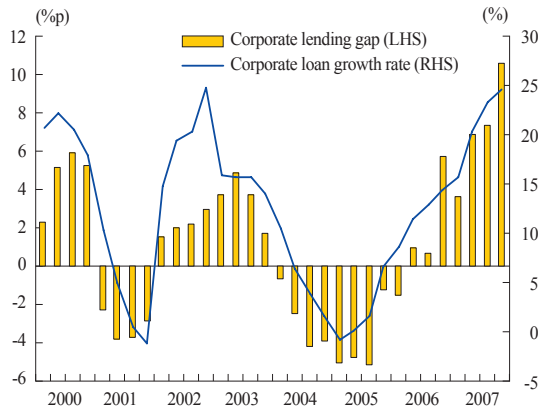
Corporate loan interest rate trends[a)]



Note: 1) New loan basis
Source: Bank of Korea

<Figure III- 5>

Bank corporate loan growth rate and corporate lending gap



Source: Bank of Korea

restaurants and hotels and manufacturing industries also continued to increase at high rates. The comparative proportions of lending extended to these industries have fallen, however, due to the faster rate of growth seen in loans to the construction and real estate sectors.

By intended use of loan, the share of facilities fund loans in overall lending expanded, while that of working capital loans shrank. This reflected the significant growth in demand for facilities investment funds during this period, driven by rising equipment investment in the manufacturing industries and land purchases in the construction and real estate sectors.

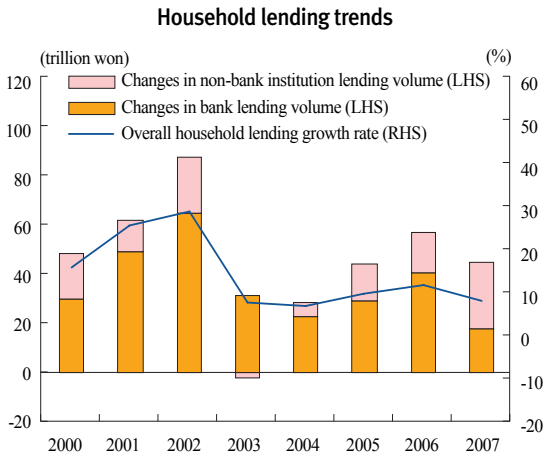
During 2007, bank interest rates on new loans to SMEs headed upward along with market interest rates. Due to the expanded discretionary authority of branch directors in setting interest rates, however, and amid the intensifying lending competition among banks, they increased more slowly than market rates.

Meanwhile, the sharp growth in banks' corporate lending has caused the ratio of corporate loans to nominal GDP to climb rapidly. With this ratio now surpassing the long-term trend, the corporate lending gap[2)] has also widened dramatically. These are signs of a growing imbalance within the corporate lending market. If corporate lending continues growing at its current rate, more rapidly than the real economy, the

2) 'Corporate lending gap' is a term interchangeable with 'credit gap', and refers to the difference between the ratio of the outstanding balance of corporate loans with respect to nominal GDP, and its trend value (obtained through several rounds of HP filtering). Borio and Lowe *(Securing Sustainable Price Stability: Should Credit Come Back from the Wilderness?* BIS Working Papers No. 157, July 2004) proposed the credit gap as an alternative indicator for predicting occurrences of financial instability due to financial imbalances, such as excessive loan growth.

quality of banks' assets, especially their loans to SMEs with low credit ratings, is likely to deteriorate should the business environment worsen.

<Figure III- 6>

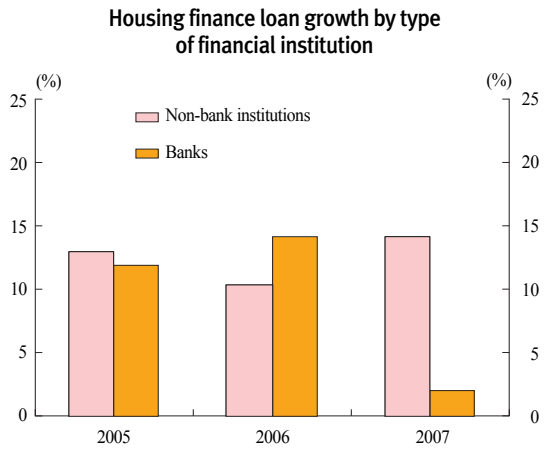


Source: Bank of Korea

Although it took effect from January 2008, the New BIS Capital Accord has as yet not affected banks' corporate lending to any significant degree, since most banks still use the Standardized Approach. When more banks adopt the new Internal Ratings-Based (IRB) Approach, however, it is likely to bring change to the domestic corporate lending market. Under the new IRB Approach, substantially higher risk weights[3] are applied to companies with low credit ratings, and this will result in either a reduction of bank lending to such firms or make it more difficult for them to obtain maturity extensions. Funding conditions will therefore vary widely among companies, depending upon their credit ratings.

Household lending growth slows

<Figure III- 7>



Source: Financial Supervisory Service

Household lending grew by only 45 trillion won during 2007, at a rate much slower than in 2006 (when it increased by 57 trillion won). This was the result of banks' stronger risk management and of the dampening of demand for housing finance loans caused by the rise in interest rates.

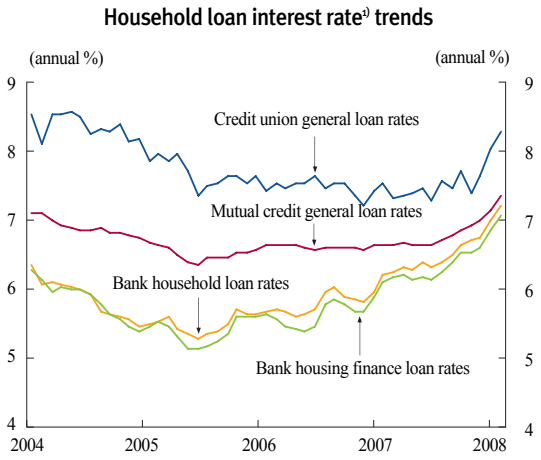
3) Risk Weights under Basel I and Basel II

(%)

Loan category		Basel I	Basel II	
			Standardized Approach	Internal Ratings-Based Approach
Household loans	Housing finance loans	50	35	3~74[1]
	General household loans	100	75	1~60[1]
Corporate loans		100	120~150	10~110[2]

Notes: 1) Default rate of 0.03-2.26% assumed
2) Loss given default (LGD) rate of 45% assumed.

<Figure III- 8>



Note: 1) New loan basis
Source: Bank of Korea

The rate of household lending growth varied significantly in 2007, depending upon the type of lending institution. While slowing sharply among banks, from 13.3% the year before to 5.0%, the rate accelerated among non-bank institutions – from 8.6% in 2006 to 13.3%. This latter phenomenon appears to have been due mainly to an increase in housing finance loans extended by community financial institutions, which are subject to less strict standards, for example on their LTV ratios.

Lending rates on household loans charged by financial institutions rose steadily during 2007, following the uptrend in market rates. Especially, bank housing finance loan rates climbed steeply from November, as CD rates surged.

As for the quality of loans, the percentage of low-grade loans in overall housing finance loans underwritten by Korean financial institutions stood at approximately 14% in 2007, roughly the same as the share of subprime loans in the US.[4] However, the risk of default in this low-grade segment does not appear high. A considerable portion of the loans concerned have been issued in accordance with various safeguard standards including the LTV ratio requirement, and the delinquency rate on them has remained steadily low. Nevertheless, in the case of a shock such as a sudden cooling of the housing market or a lending rate hike, the asset qualities of some non-bank institutions dealing extensively in low-grade housing finance loans could deteriorate.

4) For more information on this subject, see <Box III-1> 'Status of housing finance loans and assessment of risk factors'.

<Box III-1>

Status of housing finance loans and assessment of risk factors

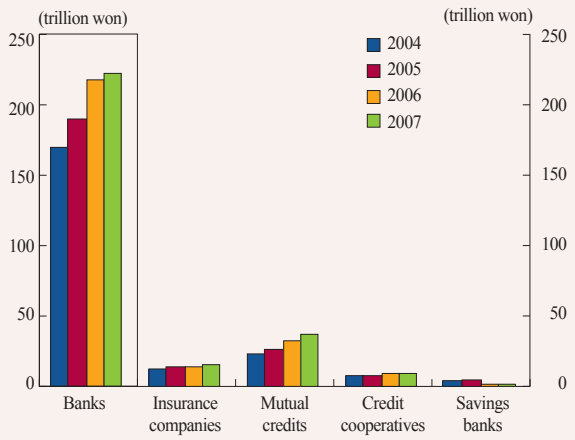
In spite of the recent slowdown in housing finance loan volume growth, the hike in lending rates is increasing the debt serving burdens of the household sector amid a housing market deceleration. What follows is a review of the status of housing finance loans at financial institutions, and of the potential risk factors for this loan segment.

The volume of housing finance loans in Korea surged sharply beginning from 2004, lifted by the favorable housing market. Housing finance loans issued by banks, in particular, more than quadrupled in total value between late 2000 and 2007 – from 54 trillion won to 222 trillion won. They currently account for over 70% of all housing finance loans. Typical housing finance loans are variable-rate loans, which means that borrowing households are subject to interest rate fluctuation risks. Yet, with the loan repayment method changing from lump sum repayment at maturity to long-term installment payments, the potential financial system risk due to cyclical maturation of a large volume of loans simultaneously has fallen greatly.

The ratio of housing finance loans to nominal GDP, which stood at 32% as of end-2007, is well below the levels of 83% in the US and the UK (both as of end-2006) and close to those in France and Japan. Hence, the current housing finance loan volume does not appear too high relative to the size of the real economy. Further, the average delinquency rate on housing finance loans in Korea, at 1%, is also a fraction of that in the US (5.8%), while the average LTV ratio stands at only 50% – again far below the corresponding ratio in the US and other developed countries (70 ~ 80%).

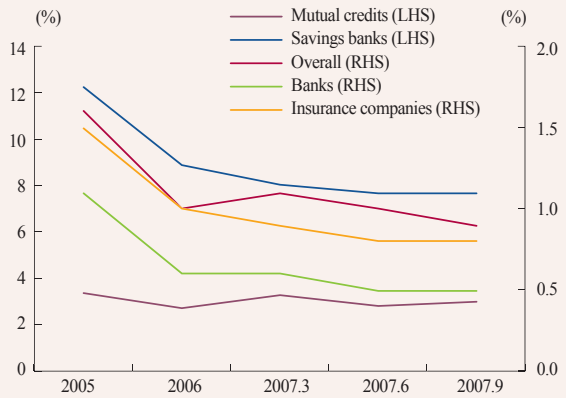
Meanwhile, the share of securitized housing finance loans in Korea is a mere 3 to 4%, compared to the corresponding figure of over 50% in the US. In any case of deterioration in housing finance loans, therefore,

Outstanding housing finance loan balances by type of financial institution



Source: Financial Supervisory Service

Housing finance loan delinquency rates by type of financial institution



Source: Financial Supervisory Service

contagion affecting the overall financial system and the broader economy through the securitization market seems likely to be quite limited in Korea. The minimal rate of mortgage securitization in Korea is mostly due to a strong preference among financial institutions for holding credits internally, in the context of their ongoing bids for asset expansion. The phenomenon also owes to the fact that debt securitization is hardly an attractive proposal for lending institutions in Korea, where the securitization market is less than well-developed, and interest rates on MBSs are high.

Looking at the quality of housing finance loans, estimation using credit rating distribution data provided by leading Korean credit information providers indicates loans to borrowers having low credit ratings to account for about 14% of total housing finance loans outstanding, a share roughly the same as that of subprime mortgages in total US mortgage loans. Any massive wave of defaults is unlikely in Korea, however, as both the average LTV ratio and the delinquency rate are kept at low levels, thanks in large part to the stricter risk management measures implemented by the financial authorities.

However, there are some non-bank financial institutions with weak operational soundness that hold large amounts of low-grade loans. Along with macroeconomic risk factors such as the possibilities of housing market slowdown and rising interest rates they contribute to a certain latent vulnerability in this sector. Moreover, the grace periods (when only interest needs to be paid) on a large volume of the installment payment loans issued widely in recent years have begun expiring since 2007, adding new pressures to borrower cash flows. Accordingly, the soundness of financial institutions and households' debt servicing capacities related to housing finance loans need to be closely monitored.

2. Bond market

Treasury bond volatility expands

During the second half of 2007, yields on Treasury bonds (three-year throughout this report) repeatedly surged and then fell back. After continuing upward from July 2007, due to successive rounds of large bond issuance and adjustment of the policy rate, yields soared to the 6% range in late October on concerns about the currency and interest rate swap markets. They then plunged sharply from mid-December, however, as calm returned to the swap market on expectations of a policy rate cut. In March 2008, yields were hovering at around 5%.

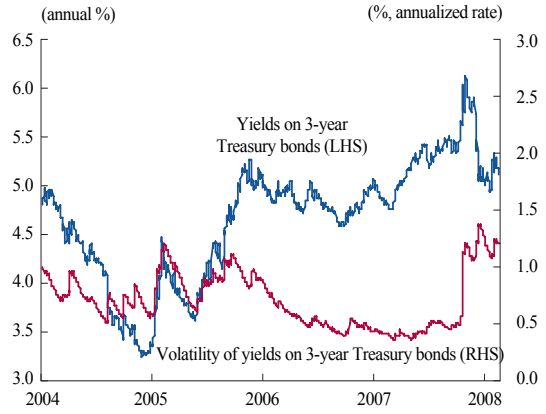
The level of volatility in the Treasury bond market was generally low until mid-November 2007, but suddenly rose thereafter – to reach more than double its level of previous periods in March 2008. Market risks related to bond investment increased as a result, and the risk of investment losses grew accordingly.

The range of fluctuation in the spread between long- and short-term interest rates (the three-year Treasury bonds yield minus the yield on 91-day CDs) also widened quickly from late November, influenced by the rapid rises and declines in Treasury bond yields.

After a noticeable widening following the sharp upward surge in Treasury bond yields in late November, the spread between long- and short-term rates became negative in December, as Treasury bond yields dove to levels below those on CDs.

<Figure III- 9>

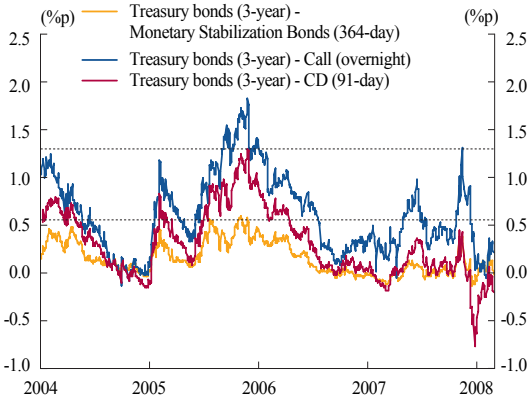
Treasury bond yields and volatility[1]



Note: 1) Volatility is calculated using the EWMA (exponentially weighted moving average) method
Sources: Bank of Korea, KOSCOM

<Figure III-10>

Long- and short-term interest rate spreads[1]



Note: 1) The upper dotted line is the long-term (Jan. 1999-Mar. 2008) average of yields on Treasury bonds (3-year) minus the overnight call rates, and the lower dotted line the long-term (Jan. 1999-Mar. 2008) average of yields on Treasury bonds (3-year) minus CD (91-day) yields
Sources: Bank of Korea, KOSCOM

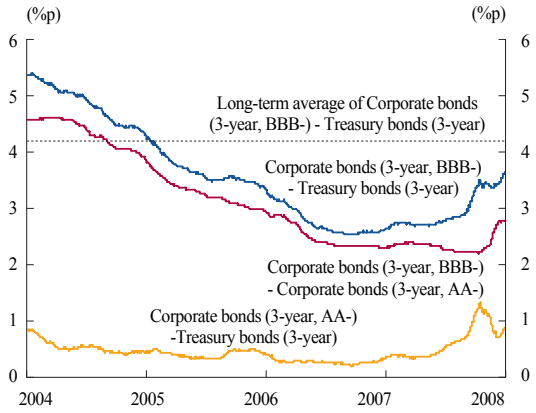
Credit spreads on corporate bonds differentiate

Credit spreads on corporate bonds (vis-à-vis three-year Treasury bonds) widened moderately from the second half of 2007, due to massive issuance of bank bonds.[5] The increase in spreads subsequently accelerated toward the end of November, owing to investors' growing preference for safe assets triggered by unrest in the swap market. From early 2008, helped by expanding corporate bond demand resulting from the reduced bank bond issuance volume,[6] the credit spreads on high-rated corporate bonds (AA-) began to shrink. Meanwhile, those on low-rated bonds (BBB-) have remained at their high levels of end-2007, as construction sector-related and other credit risks persist.

As risk weights on corporate bonds are now differentiated from 20 to 150% in line with their credit ratings,[7] following entry into effect of the New BIS Accord in January 2008, the disparity in credit spreads between high-and low-rated bonds is likely to become more salient in the time ahead.

<Figure III-11>

Credit spreads on corporate bonds[1]



Notes: 1) Based on the averages of mark-to-market yields estimated by three bond valuation organizations
2) Average for the period between January 2001 and March 2008
Source: KOSCOM

Foreigners' bond holdings increase

During 2007, foreign investors (including local branches of foreign banks) recorded a net buy position of 45.2 trillion won in the domestic bond market, as a

<Table III- 1>

Net buying of Korean bonds[1] by foreigners[2]

(trillion won, %)

	2005	2006	2007	1st half	2nd half	2008[3]
Government bonds	2.1	11.8	18.6	5.9	12.7	1.8
Monetary Stabilization Bonds	1.5	5.1	23.8	8.4	15.4	3.9
Others	-0.2	1.1	2.8	2.1	0.7	-0.2
Total	3.4	18.0	45.2	16.3	28.9	5.5
Percentage share[4]	4.4	6.3	11.1	7.8	11.1	11.4

Note : 1) Including bonds redeemed at maturity
2) Including local branches of foreign banks
3) Year-to-March 2008
4) The share of bonds held by foreigners in total publicly-traded bonds at the end of each period
Sources: Financial Supervisory Service, KOSCOM

5) Due to the sluggish growth in corporate bonds, in terms both of issuance and circulation, their credit spreads have tended to move in parallel with spreads on bank bonds.
6) Bank bond net issuance was 3.4 trillion won in January 2008, but dropped to 0.3 trillion won in the following month of February.
7) Prior to entry into effect of the New BIS Accord, a risk weight of 100% was applied to corporate bonds. Under the New BIS Accord, however, risk weights vary in accordance with the credit rating – from 20% (AAA to AA-) to 50% (A+ to A-), 100% (BBB+ to BB- and ungraded bonds) and 150% (below BB-).

result of active arbitrage trading.[8] This was nearly 2.5 times their position the previous year of 18 trillion won. In consequence, the share of foreign-held bonds in total domestic bonds increased sharply – from 6.3% at the end of 2006 to 11.1% at end-2007. During January to March 2008, the net buying position of foreigners increased by an additional 5.3 trillion won, lifting their share in the domestic bond market to 11.4%.

The recent buoyancy of foreign investment in domestic bonds appears to be having positive effects on the market, helping to buffer the shock from excessive capital flight from the stock market[9] while at the same time increasing purchasing power for domestic bond market.

The foreign buying spree is not without its negative side effects as well, however. Foreign investors are acquiring domestic bonds mostly through arbitrage trade, which is leading to an increase in short-term foreign debt and expanded bond market volatility influenced by shifting foreign investor investment patterns. As the bond market has to contend now with the possibility of massive desertion by foreign capital[10] in the event of deteriorating domestic or global financial and economic conditions, potential risks to stability have increased compared to the past. Sudden foreign capital flights from bond markets have been seen in some emerging market countries, triggered for instance by surges in investor risk avoidance.

8) For more details on this topic, see 'Foreigners' interest arbitrage bond trading and its effects on the Korean bond market' in <Box II-2> herein.

9) During 2007, capital inflow from foreigners' net purchases of bonds (45.2 trillion won) greatly surpassed capital outflow from their net selling of stocks (24.7 trillion won).

10) Borio and McCauley pointed out, in 'The Economics of Recent Bond Yield Volatility' (BIS Economic Papers No. 45, July 1996), that although foreign capital inflows to bond market, are often slow and progressive, their outflows generally tend to be sudden and massive.

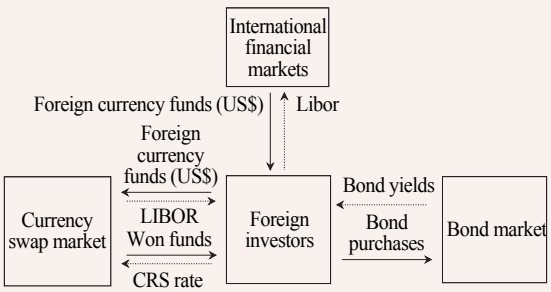
<Box III-2>

Foreigners' interest arbitrage bond trading and its effects on the Korean bond market

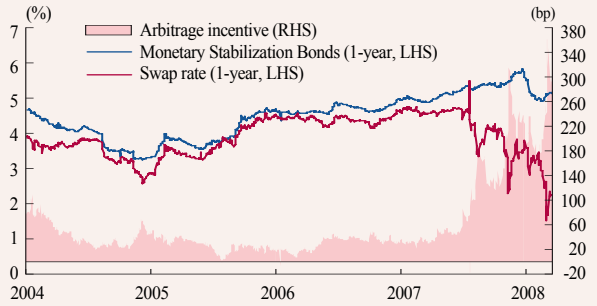
Since 2007, Korea has seen a dramatic increase in foreigners' investment in the domestic bond market, driven particularly by large increases in the buying of Treasury bonds and Monetary Stabilization Bonds. As a result, foreign investors' share of domestic bonds outstanding has expanded rapidly– from a mere 6.3% at end-2006 to 11.4% at end-March 2008. This development has been due largely to the fact that FX swap rates and currency swap (CRS) and interest rate swap (IRS) rates are currently well below the interest rate differential and bond yields, respectively, which increases the incentive for interest rate arbitrage. In what follows, we will take a look at patterns of arbitrage using currency[i] and interest rate swaps, and the resulting effects on the domestic bond market.

In the case of a currency swap, ① a foreign investor first borrows foreign currency (US dollar) funds in the international financial markets, and then ② procures won in exchange for the borrowed foreign currency funds, by entering into an agreement in the local swap market to pay the CRS rate on the won funds and receive LIBOR on the foreign currency funds. Finally, ③ the foreign investor buys Korean Treasury bonds or Monetary Stabilization Bonds using the won funds so procured. Due to banks' demand for foreign funds through currency swaps (created by increased sales of forward exchange contracts by shipbuilders and asset management companies), CRS rates in the Korean swap market are currently lower than bond yields. Foreigners' investing in Korean bonds through the above-described interest rate arbitrage process can thus enjoy risk-free profits, corresponding to the differences between bond yields and the CRS rates.

Structure of bond investment using currency swaps



Arbitrage incentive in the currency swap market

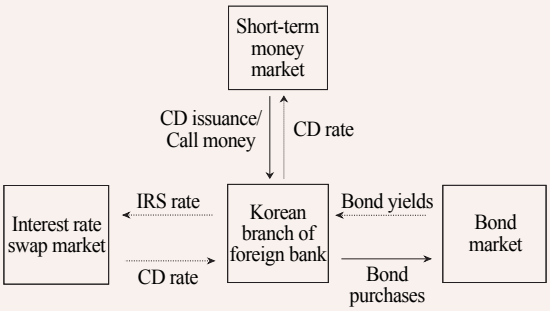


In the case of an interest rate swap, ① a foreign investor enters into an agreement to pay the IRS rate and receive the CD rate in the local swap market, and ② procures funds by issuing CDs or borrowing call money, which are then used to ③ buy Treasury bonds or Monetary Stabilization Bonds. Although IRS rates should in theory be higher than the yields on risk-free instruments like Treasury bonds or Monetary Stabilization Bonds,

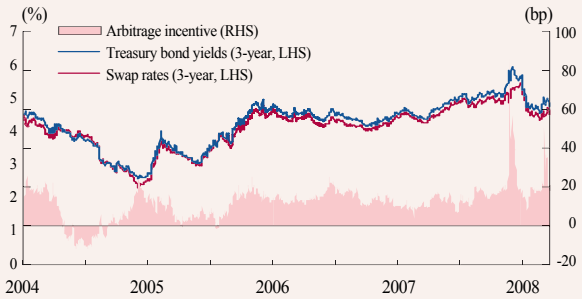
i) Currency swap transactions are essentially identical to foreign exchange swap transactions, insofar as both consist in the swapping of foreign currency funds against won funds on the condition of return of the principal at the end of the agreed term. The only differences between them lie in the method of interest payment and the maturity period. Both types of transaction can therefore be used for arbitrage.

they are currently lower – due to continuous demand from Korean banks for hedging of interest rate risk related to adjustable rate mortgages. This allows foreigners to enjoy profits corresponding to the difference between bond yields and IRS rates.

Structure of bond investment using interest rate swaps



Arbitrage incentive in the interest rate swap market



Effects of interest rate arbitrage on the Korean bond market

The increased foreign investment in domestic bonds had led positive affects, including expansion of the buyer base for domestic bonds, enhancement of the infrastructure of the Korean bond market, and offsetting of the shock due to excessive capital flight from the stock market. Its effects appear double-edged, however, as the heavy involvement of arbitrage in foreign investors' purchases of domestic bonds has proven to have certain undesirable consequences for the market.

First, foreigners' acquisition of domestic bonds for arbitrage purposes has caused Korea's foreign debt-related indicators to deteriorate. The foreign debt balance at local branches of foreign banks jumped from US$ 51.8 billion at end-2006 to US$ 78.8 billion at end-2007. Meanwhile, the floating external debt ratio climbed steeply – from 55.0% at the end of 2006 to 74.0% at the end of 2007.

Short-term external debt attributable to foreigners and local branches of foreign banks[1)]

(billion US$)

	2003	2004	2005	2006	2007
Foreigners[2)]	1.0	0.6	1.3	2.4	7.6
Local branches of foreign banks[3)]	19.7	21.0	23.3	51.8	78.8

Note : 1) Period-end basis
2) Foreigners' short-term securities purchase balance
3) Total short-term external loans taken out by local branches of foreign banks
Source : Bank of Korea

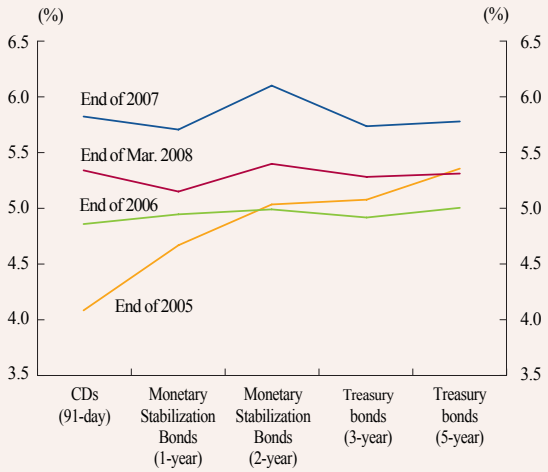
Second, the growth in foreigners' bond investment linked with the swap market has the effect of increasing the likelihood of a shock occurring in one market being transmitted immediately to other markets. In late November 2007, in fact, when the currency swap market was shaken by worries about global credit crunch, the turmoil spread quickly to the interest rate swap and bond markets, causing bond rates to escalate and IRS rates to tumble. Worse yet, this triggered loss-cut selling by some financial institutions, setting off strong tremors in the bond market.[ii)] Any sudden and massive foreign investor withdrawal from the bond markets, in response to negative developments in domestic or international financial conditions, could also now spell chaos for the

ii) For more information on this topic, see '<Box I-2> Reasons for the unease in the currency and interest rate swap markets in November 2007', pp. 28-29 of the Monetary Policy Report (Mar. 2008, Bank of Korea).

overall financial market – knocking it completely off balance. An excellent case in point is the sharp hike in Turkish treasury bond yields from the 13% to the 18% range between early May and late June 2006, sparked by a massive sell-off by foreigners amid their growing tendency toward risk avoidance.

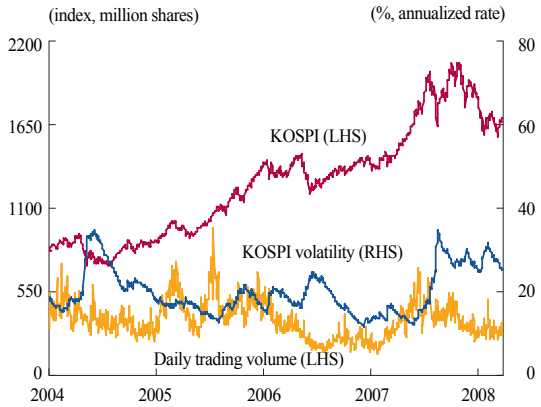
Third, foreigners' investment in domestic bonds has led to distortion of some sections of the long-and short-term yield curves. Bond yield curves, which had maintained generally upward-sloping shapes until the end of 2005, began to flatten out or slope downward from 2006. This was particularly true for 1-year and 3-year maturity bonds, which are most frequently purchased by foreign investors.

Long-and short-term yield spreads



<Figure III-12>

Stock price and volatility[a)]



Note: 1) Calculated by the EWMA (Exponentially-Weighted Moving Average) method
Sources: Bank of Korea, Korea Exchange

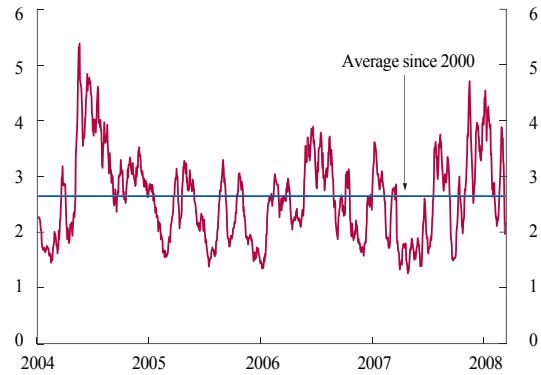
<Figure III-13>

VIX[1)]

Note: 1) Stock price volatility index for underlying assets of the KOSPI 200
Sources: Bank of Korea, Korea Exchange

<Figure III-14>

HHR[1)] of stock market



Note: 1) Based on the KOSPI, 10-day moving average of daily HHRs
Sources: Bank of Korea, Korea Exchange

3. Stock market

Stock price volatility expands

Stock price volatility expanded dramatically during the second half of 2007, as the US subprime mortgage shock sent unrest spreading through international financial markets.

The KOSPI (Korean composite stock index), while adjusting in June and July due to concerns about the subprime mortgage problems, remained generally on an upswing most of the year, and eventually hit a historic high of 2,065 at the end of October. Starting from November, however, the KOSPI plunged in line with large net selling by foreigners, amid global stock market declines caused by growing uncertainties related to the subprime mortgage troubles. The downward spiral continued through to 2008, and at the end of March 2008 the KOSPI was 18% below its end - October 2007 level.

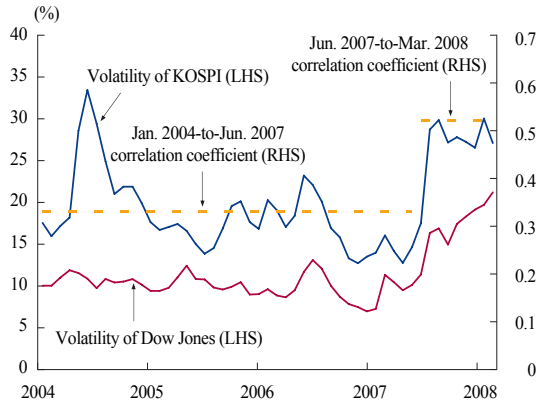
The volatility index (VIX)[11)] climbed steeply in late July and has remained in the same high range since then, suggesting an elevated degree of risk aversion among investors. The stock trading value fell from a daily average of 6.8 trillion won in July-December 2007 to 5.0 trillion won in January-March 2008, reflecting dampened investor confidence.

The HHR (Hui Heubel Ratio),[12)] an indicator of stock

11) The VIX for the KOSPI was calculated borrowing the method used at the CBOE. A high VIX implies a heightening degree of risk aversion in stock investment.
12) HHR={(highest price-lowest price)/lowest price}/(trading value /total market capitalization)

<Figure III-15>

Volatility of KOSPI and Dow Jones[1] and correlation coefficients[2]



Notes: 1) Calculated by the EWMA (Exponentially-Weighted Moving Average) method
2) Coefficient of correlation between previous day's US market volatility and same day volatility of Korean market
Sources: Korea Exchange, Bloomberg

<Table III- 2>

Changes in Korean stock prices on days of price rise (decline) in US[1]

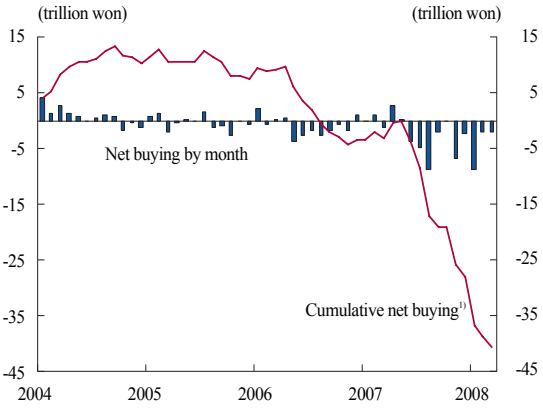
(period average, %, times)

	Jan. 2004 -Mar. 2008	Jan. 2004 -Oct. 2007	Nov. 2007 -Mar. 2008
Rate of Dow Jones decline (A)	-0.61	-0.53	-1.23
Rate of KOSPI decline (B)	-0.22	-0.14	-0.73
B/A	0.36	0.30	0.59
Rate of Dow Jones rise (C)	0.57	0.52	1.02
Rate of KOSPI rise (D)	0.35	0.34	0.38
D/C	0.61	0.65	0.37

Note : 1) Previous day basis for Dow Jones and same day basis for KOSPI
Sources: Korea Exchange, Bloomberg

<Figure III-16>

Foreigners' net buying of Korean stocks



Note: 1) 2004-to-date
Source: Korea Exchange

market liquidity as well as stock price volatility, has remained at a level above its long-term average since November 2007, suggesting that the stock market has become less resilient.

In the meantime, the linkage between domestic stock prices and stock prices in major economies has strengthened since November 2007. The influence of US stock price declines in particular seems to have become much more consequential than in the past. Between November 2007 and March 2008, the ratio of the rate of price decline in the Korean stock market compared to that in the US market[13] was 0.59 – significantly above the corresponding ratio relative to U.S. stock price increases (0.37). The contagious effects of stock price movements in major economies on Korean stock prices, increasing their volatility, is expected to worsen until the subprime-related uncertainties in the international financial markets are resolved.

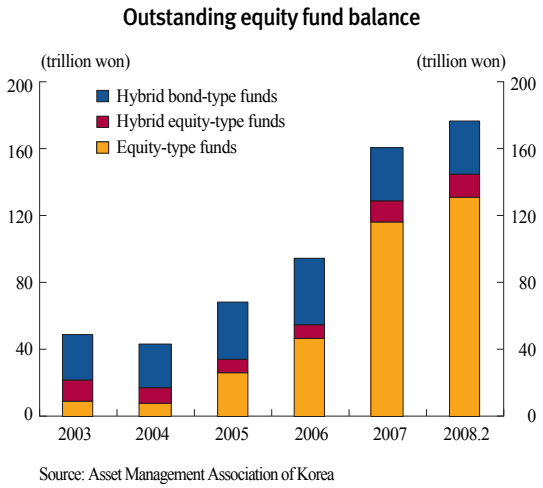
Foreign investors' net selling increases

Since the second half of 2007, foreigners' net selling of Korean stocks has grown sharply. Their net selling position (stock market basis), which averaged 0.5 trillion won monthly between January 2005 and June 2007, increased sharply to 4.1 trillion won per month between July 2007 and March 2008. A number of factors seem to have contributed to this phenomenon, namely, the need for dollar funds amid a dwindling of global liquidity, portfolio reallocations between

13) The average rate of price decline among Korean stocks relative to the corresponding rate among US stocks, on the day immediately following that on which US market prices fell.

countries, and an increasing preference for safe assets.[14] Given how the share of foreign-held stocks in Korea[15] is still quite high compared to emerging market countries, net selling by foreigners could possibly continue for some while into the future. The effect of this phenomenon can be generally disruptive for the stock market, as it can act to either limit price recovery or widen the scope of price decline.

<Figure III-17>



Source: Asset Management Association of Korea

Equity-type funds contain potential vulnerabilities

The amount invested in equity-type funds has increased steadily since 2005, to hit a monthly average capital inflow of 6 trillion won (based on standard equity-type funds) in 2007. Capital inflows to these funds have slowed noticeably in 2008, however, affected by the stock market decline.

The effect of the increased capital inflows into equity-type funds has been quite positive overall thus far, helping to expand the domestic institutional purchasing power and substitute for foreign investors' net selling. Following the rapid increase in capital inflows to them in a short period, however, equity-type funds appear to have certain latent structural vulnerabilities. As assets pooled by equity-type funds are invested in only a handful of countries,[16] the risk diversification effect appears to be minimal. Further, as a large number of

14) The State Street Investor Confidence Index, an indicator of investors' risk appetite, stood at 77.4 in March 2008 - substantially lower than the 2003-2007 average of 89.4. A drop in this index generally means that the ratio of stocks relative to safer assets in investors' portfolios has been reduced.

15) The ratio of foreign-held stocks to total market capitalization (stock market basis) tumbled from 42.0% at the end of 2005 to 30.6% at the end of March 2008. However, this is still well above the corresponding average among emerging market countries (about 25% in 2006).

16) Of all funds investing in overseas equities, 59.1% invest in Chinese stocks (as of end-2007).

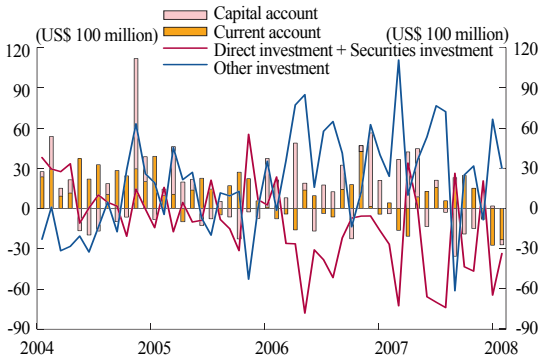
equity-type funds allowing frequent deposits and withdrawals, such as lump-sum contribution funds and ongoing contribution funds with flexible contribution options,[17] and as many asset management companies tend to pursue the same or similar investment strategies at any given time,[18] equity-type funds can contribute to increasing of stock price volatility.

17) Lump-sum contribution funds and ongoing contribution funds account for 56.5% and 43.5%, respectively, of the total balance of stock funds in Korea (as of end-Jan. 2008). Meanwhile, it is estimated that over 80% of ongoing contribution funds are funds with flexible contribution options.

18) By investment class, 70% of total stock funds in Korea are currently large-cap growth funds, 18% large-cap hybrid funds, and 6% large-cap value funds (as of Jan. 2008).

<Figure III-18>

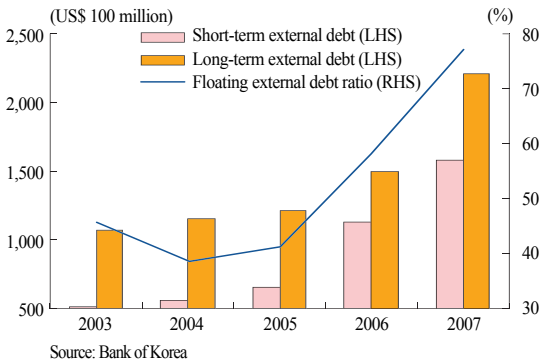
Balance of payments



Source: Bank of Korea

<Figure III-19>

Balance of foreign debt and floating external debt ratio



Source: Bank of Korea

<Table III- 3>

Spreads on short-term foreign borrowings by domestic banks[1)]

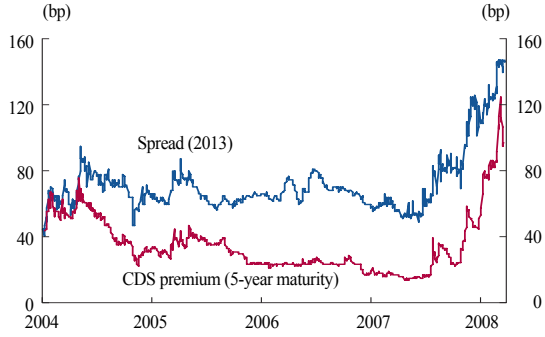
(bp)

Dec. 2006	Mar. 2007	Jun.	Sep.	Dec.	Mar. 2008
7	5	7	18	31	32

Note : 1) Spreads on LIBOR, period average basis; excluding Citibank Korea and SC First Bank
Source: Bank of Korea

<Figure III-20>

Spreads[1)] and CDS premiums on Foreign Exchange Stabilization Bonds



Note: 1) Spread on US Treasury bonds
Sources: KCIF, JP Morgan

4. Foreign exchange market

Foreign exchange demand increases

Demand for foreign exchange has surpassed supply, as both the current account and the capital account have swung into deficit.

The current account, after recording a surplus of US$ 5.95 billion in 2007, switched to a deficit of US$ 5.1 billion during January and February 2008. High raw materials prices took a toll on the goods account, pushing it into deficit, while the service account remained in deficit. Due to massive outflows of foreign capital from the stock market, meanwhile, the capital account recorded a US$ 200 million deficit during January and February, even despite the sharp growth in foreign currency borrowings by financial institutions.

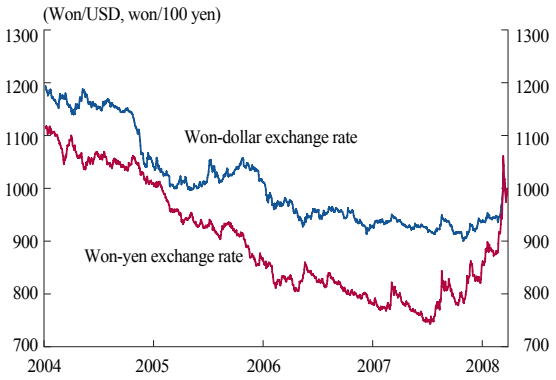
Meanwhile, the floating external debt ratio has risen steeply as a result of sharp growth in short-term foreign debt-driven by the continuous increase in foreign borrowings by banks adjusting their positions following large selling of forward exchange contracts by exporters, and by surging foreign investment in domestic bonds since the second half of 2007.[19)] If there is any further growth in the current account deficit foreign debt soundness as measured by the floating external debt ratio can weaken.

Borrowing conditions for Korean banks have worsened due to the credit crunch in the international financial

19) The ratio of floating external debt with one year or less to maturity to foreign exchange reserves also increased at a record rate, from 55.0% at the end of 2006 to 74.0% at end-2007.

<Figure III-21>

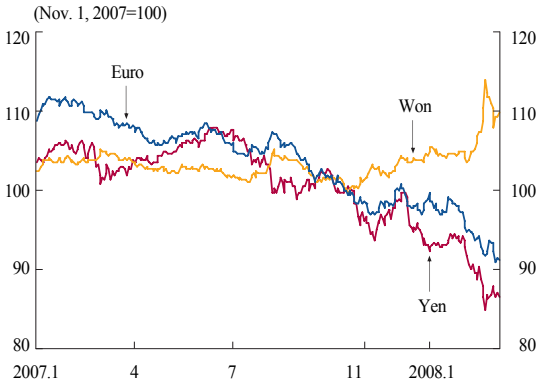
Won-dollar and won-yen exchange rates



Source: Bank of Korea

<Figure III-22>

US dollar cxchange rate versus Won, Yen and Euro[1)2)]

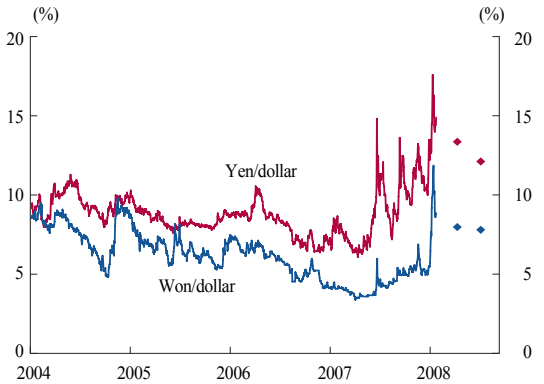


Note: 1) Indexed values of the US dollar against the respective currencies (Nov. 1, 2007=100)
2) The euro exchange rate is the euro/dollar rate rather than the usual dollar/euro.

Source: Bank of Korea

<Figure III-23>

Implied volatility of won-dollar and yen-dollar options[1)]



Note: 1) 3-month option basis (The "◆" symbols indicate the rates of volatility implied in 6-month and 12-month options).

Source: Bloomberg

markets. The premium on short-term foreign currency loans increased dramatically from 7bps in June 2007 to 32bps at March 2008. That on Foreign Exchange Stabilization Bonds (2013 maturity), which stood in the upper 50 bp range in the first half of 2007, began a steep upward spiral in August to reach 147 bps by end-March 2008. Korean banks have maintained net borrowing positions, as their overseas borrowings (new loans + loans rolled over) still exceed the volume of their maturing loans.[20)]

Won weakens

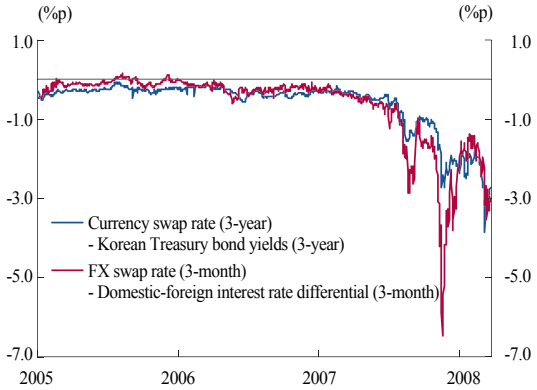
The US dollar continued to soften against the won in 2007, falling to a low level of 900.7 won at the end of October – down 3.2% from the end of 2006. Starting from mid-November, however, in contrast to most major currencies,[21)] the won began to weaken against the dollar. This was the consequence of a combination of factors, including the continuing large volume of net sales of stocks by foreign investors, increased net buying of non-deliverable forwards by non-residents, and the current account swinging into deficit. At the end of March 2008, one US dollar bought 990 won, a 9% increase from the end of October.

The Japanese yen, after resuming a steep upward trend against the won in late November 2007, has fluctuated at around the 990 won per 100 yen level since the end of March 2008. This phenomenon has been due to the yen's sharp gain against the dollar, benefiting from yen carry trade unwinding, while at the same time the won has lost ground vesus the dollar.

20) Between August 2007 and March 2008, the overseas loan roll-over rate [(new loans + rolled over loans)/maturing loans] surpassed 100%.
21) Between November 2007 and March 2008, the yen and the euro appreciated by 13% and 9%, respectively, against the dollar.

<Figure III-24>

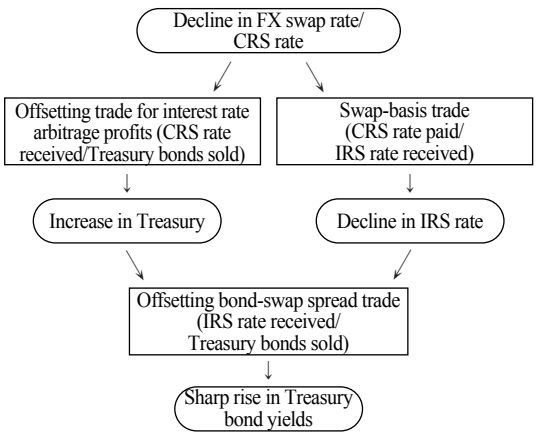
Interest rate swap and currency swap rates



Source: Bloomberg

<Figure III-25>

Swap-linked bond transactions and influence on bond yields



<Table III- 4>

Volume of swap trading among foreign exchange banks

(daily average, US$ 100 million)

	2004	2005	2006	2007
Swap-related transactions	7.9	12.9	26.7	49.0
Currency swaps	4.1	4.9	8.7	15.8
Interest rate swaps	3.8	8.0	18.0	33.2
Option-related transactions	4.5	5.7	9.6	13.9
Currency options	4.3	5.2	8.5	12.3
Interest rate options	0.2	0.5	1.1	1.6

Source: Bank of Korea

Exchange rate volatility has increased, fueled by the heightened uncertainty in capital flows, as worries persist in the international financial markets. The recent rise in volatility implied in won/dollar and yen/dollar options suggests growing exchange rate uncertainty.

Continuing swap market imbalances

From the 2nd half of 2007, FX swap and CRS rates[22] showed steady declines, under the influence of increased selling of forward exchange contracts by shipbuilders and investors with overseas assets, and fears of a global credit contraction. The rates have rebounded moderately in 2008 with the partial improvement in swap market supply conditions. The incentive for interest rate arbitrage, which reached a high point in the 2nd half of 2007, has also diminished somewhat as a result.

As FX swap rates fell below domestic-foreign interest rate differentials and CRS rates below Treasury bond yields, the volume of interest rate arbitrage trading increased in 2007, especially among international investors, and in the process drove up foreign debt and bond yield volatility. Growth in the volume of this type of transaction linking swap operations with the bond trade had the effect as well of strengthening correlation between the two markets,[23] for instance causing

22) The FX swap rate is the difference between the forward exchange and spot exchange rates, divided by the spot rate. The CRS rate is the won interest rate paid or received against receipt or payment of LIBOR.

23) There have been noticeable increases in transactions aimed at offsetting valuation losses on interest rate arbitrage positions (resulting from a decline in CRS rates) and in swap basis trades seeking to capitalize on an eventual rise in CRS rates. This has caused CRS rates and IRS rates to tumble and government bond yields to rise. That has triggered offsetting transactions again, this time to liquidate bond-swap spread trade positions, and thus driven Treasury bond yields up further.

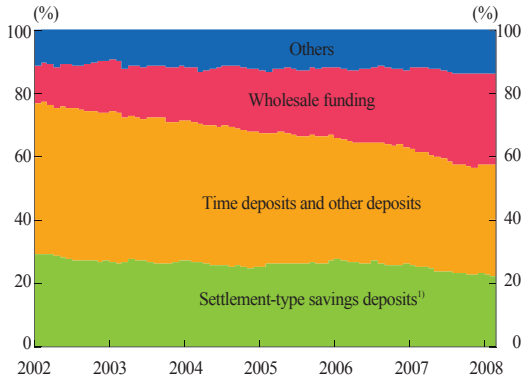
Treasury bond yields to spike sharply in November 2007.

The linkage between the won market and other currency markets is expected to strengthen further in the future, in line with the increase in swap market volume as well as worldwide financial market integration. This means a commensurate increase in the likelihood of trading behavior and negative developments in one market affecting and spilling over to the other financial markets, thus magnifying market volatility and uncertainty.

Ⅳ. Soundness of financial institutions

<Figure IV- 1>

Composition of commercial bank won-denominated liabilities by funding source



Note: 1) Demand deposits + settlement-type savings deposits
Sources: Banks' call reports

<Table IV- 1>

Composition of bank assets

(Year-end basis)

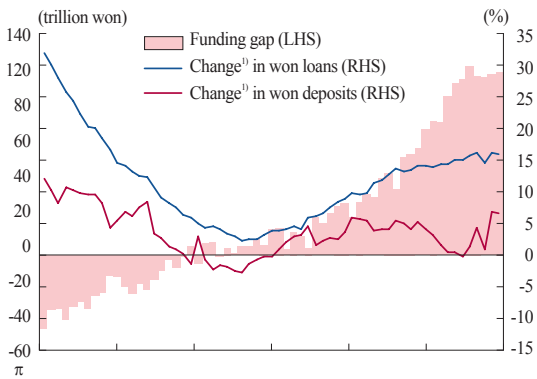
(%)

	2003	2004	2005	2006	2007
Loans	64.5	65.1	64.0	64.6	66.5
(Household)	33.7	35.4	35.8	36.0	33.7
(Corporate)	30.0	28.9	27.2	27.6	31.6
Securities	19.8	18.9	20.3	17.9	16.1
Others[1)]	15.7	15.9	15.7	17.5	17.5

Note: 1) Deposits, bills bought, and payments on loss compensation related to payment guarantees
Sources: Banks' call reports

<Figure IV- 2>

Commercial bank funding gap



Note: 1) Changes from the corresponding periods of the previous years
Sources: Banks' call reports

1. Soundness of banks

Sources and uses of funds

Share of wholesale funding jumps

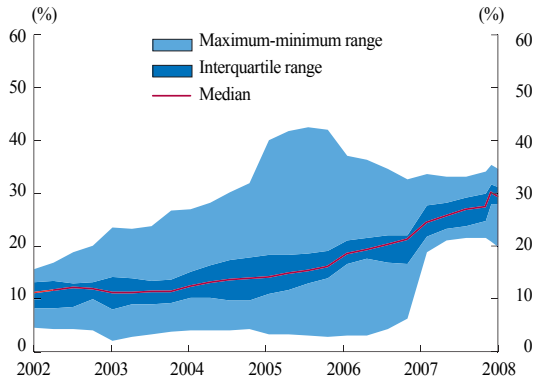
During 2007, reliance on wholesale funding[1)] by nationwide commercial and local banks increased sharply. The share of wholesale funding in banks' total won-denominated liabilities jumped 4.8% points, from 24.3% at the end of 2006 to 29.1% at end-2007, a rate far surpassing the corresponding increase during the previous one-year period (2.6% points). Meanwhile, the share of traditional deposits, including time deposits, shrank rapidly from 62.8% to 57.3% during the same period, as money moved toward higher - yielding financial products. Entering into 2008, the fund flight from banks decelerated somewhat, however, in part thanks to banks' active efforts to attract deposits, and in part on the back of the heightened stock price volatility at home and abroad, which caused the share of wholesale funding to decrease slightly.

Despite the continuing fund outflows from their deposits, banks have maintained their bids to expand their asset scales, by notably increasing their volumes of lending to SMEs. To meet the growing need for loan funds, most banks have in the process massively

1) Includes bank bonds, CDs, RPs, cover bills, etc.

<Figure IV- 3>

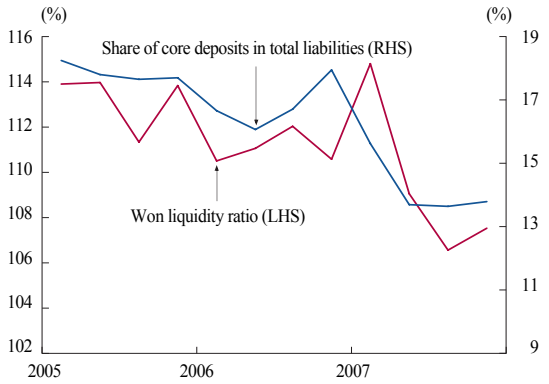
Commercial bank wholesale funding as a share of total liabilities



Sources: Banks' call reports

<Figure IV- 4>

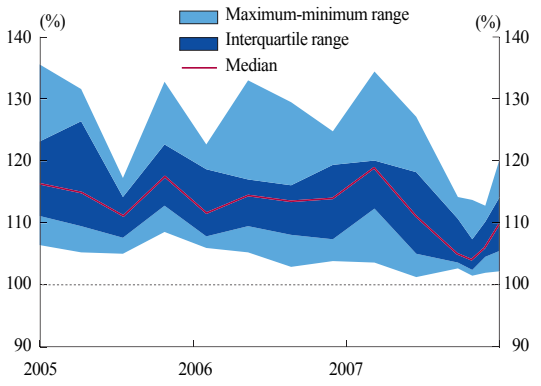
Commercial bank won liquidity ratio and share of core deposits[1)]



Note: 1) Core deposits / total liabilities
Sources: Banks' call reports

<Figure IV- 5>

Commercial bank won liquidity ratio



Sources: Banks' call reports

increased their issuances of CDs and bank bonds. This has resulted in a widening of the funding gap,[2)] an indicator of liquidity risk.

A greater reliance on wholesale funding, coupled with a diminished contribution from deposits as a funding source, means increased bank exposure to liquidity risk. A sharp increase in the share of wholesale funding in total liabilities in 2007 was also seen among local banks, whose reliance on this type of funding source has in the past been generally quite low. Should market conditions take a negative turn, some local banks with only moderate shock absorption capacities are likely to experience difficulties in liquidity management. This scenario was in fact already borne out during the fourth quarter of 2007, when unrest in domestic and overseas financial markets made it more difficult for most commercial banks to procure funds, placing them under tremendous liquidity pressures.

In the early 2000s, consolidated financial laws similar to 「Korea's Capital Market and Financial Investment Services Act」 were introduced in the UK and Australia. After the coming into effect of these laws, deposit money flew into new investment-type financial products in those countries. Banks' reliance on wholesale funding increased, as a result, in turn driving up the market sensitivity of their funding.[3)] With the 「Capital Market and Financial Investment Services Act」 coming into force in Korea early next year, therefore, should the share of wholesale funding in banks' total funding rise there is a likelihood of their funding structures being destabilized.

2) Funding gap = Won loans - Won deposits
3) For more information on this topic, see '<Box IV-1> Enactment of consolidated financial laws in the UK and Australia, and related risk factors'.

<Table IV- 2>

Commercial bank average asset and liability maturities

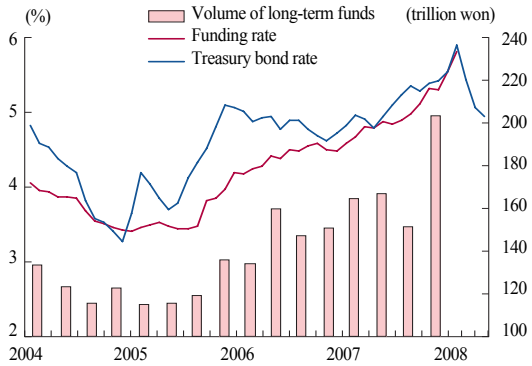
(number of months)

	Dec. 2005	Jun. 2006	Dec. 2006 (A)	Jun. 2007	Dec. 2007 (B)	B-A
Won-denominated assets	32.7	36.4	41.8	41.2	42.4	0.6
(home mortgage loans)	74.6	90.3	111.7	111.7	119.2	7.5
Won-denominated liabilities	18.6	18.4	19.4	18.0	17.8	-1.6
(deposits)	19.1	18.9	20.0	18.6	18.7	-1.3

Sources: Banks' call reports

<Figure IV- 6>

Commercial bank long-term funding rate[a] and volume



Note: 1) Time deposits + bank bonds
Sources: Banks' call reports

Liquidity ratio remaining stable

Banks' won liquidity ratio,[4] an indicator of their short - term liquidity, fell from 110.6% at the end of 2006 to 107.5% at end-2007. Between October and November 2007, when fund flows tightened sharply, the liquidity ratio of some banks declined to levels very close to the ratio (100%) recommended by the financial supervisory authority.

This fall in the won liquidity ratio was caused by growth in the volume of banks' short-term borrowings[5] such as call money, etc., coupled with a fund flight from core deposits (many of which are classified as long-term liabilities).[6] This drove up the proportion of banks' current liabilities (with maturities of 3 months or less), at a time when the share of their current assets had shrunken due to the increased volume of long-term installment-type home mortgage loans.

To shore up their declining liquidity ratios, banks issued CDs and bonds with longer maturities and offered high promotional rates on time deposits. These moves have negatively affected banks' profits, with the heightened funding costs eroding their net interest margins. Excessively large issues of bank bonds have also had crowding out effects in the bond market.

4) The liquidity ratio is calculated by dividing assets with maturities of 3 months or less by liabilities with maturities of 3 months or less. Effective September 2007, banks are required to report their liquidity ratios on a monthly rather than a quarterly basis.
5) During the second half of 2007, the volume of commercial banks' short-term borrowings increased massively from the corresponding period a year previously-from 15.4 trillion to 18 trillion won.
6) About 80-90% of all deposits without maturity (e.g. demand deposits, savings deposits and current corporate deposits) are classified as core deposits, and by regulation 85% of all core deposits, excluding those with maturities of 3 months or less, are treated as long-term liabilities with maturities of 3 years or longer.

The foreign currency liquidity ratio,[7] an indicator of capacity to repay short-term foreign currency debts, stabilized in the upper 90% level in 2007, comfortably above the 90% range recommended by the Financial Supervisory Service. This was thanks to banks' conservative management strategies for their foreign currency-denominated assets[8] and offset the effects of the worsened foreign currency borrowing conditions due to international financial market unrest.

7) Foreign currency liquidity ratio
(End-period basis)

(%)

Jun. 2006	2006	Jun. 2007	2007
97.2	99.3	97.2	98.7

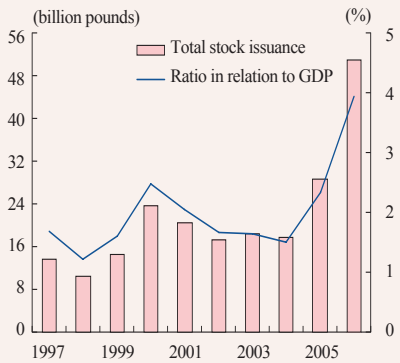
8) Effective August 2007, the Bank of Korea tightened the rules on lending in foreign currencies to residents, by limiting the usage of foreign currency loans to funds for overseas use and domestic facilities funds for manufacturers.

<Box IV-1>

Enactment of consolidated financial laws in the UK and Australia, and related risk factors

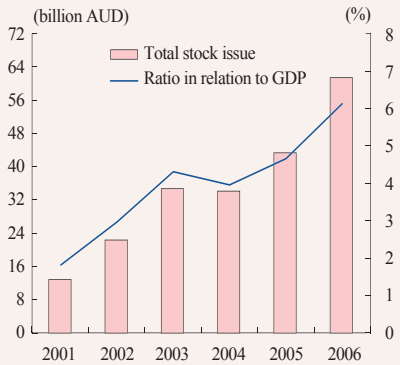
In the early 2000s, laws similar to the Korea's Capital Market and Financial Investment Services Act, which will introduce a new and more comprehensive definition of financial products and establish a functional regulatory framework, were enacted and implemented in the UK and Australia.[i] Since the implementations of these new laws, positive effects have been felt across the countries' financial industries, such as accelerated growth of their capital markets and increased financial sector contributions to their national economies.

Changes in volume of new stock issuance in UK



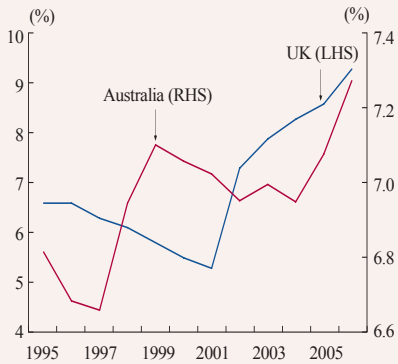
Source: IMF

Changes in volume of new stock issuance in Australia



Source: IMF

Financial service sector contributions to GDP in UK and Australia

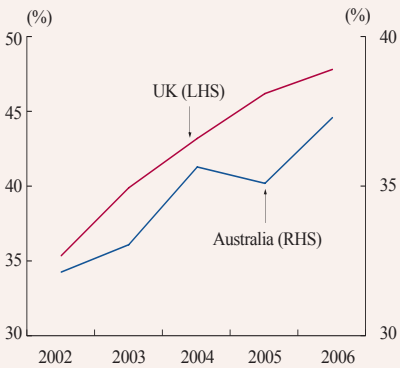


Sources: UK and Australian national statistical authorities

However, due to the extensive easing of regulations on financial products in regard to their design and sales as well as related investment, the UK and Australian financial sectors now have to contend with a variety of new risk factors, both latent and actual.

First, the degrees of liquidity risk that financial institutions face have increased. The host of new financial products hitting the markets since the entries into effect of the new laws have weakened banks' deposit funding bases and driven their reliance on wholesale funding up. As a result, the market sensitivity of banks' funding has been significantly heightened, making it more difficult for them to flexibly manage liquidity risks in line with market conditions. Just how dangerous such a situation can be is clearly demonstrated by the case of Northern Rock in the UK. With wholesale funding accounting for over 70% of its total funding, the UK bank was thrown into a severe liquidity crisis last fall,

Shares of wholesale funding in total funding of UK and Australian banks



Sources: Bank of England, Australian Prudential Regulation Authority

i) In the UK, the 2000 enactment of the Financial Services and Market Act repealed pre-existing banking, financial service and insurance laws. In Australia, the Financial Services Reform Act was passed in 2001, repealing and consolidating the Pension Industry Act, the Companies Act, and the Retirement Savings Accounts Act.

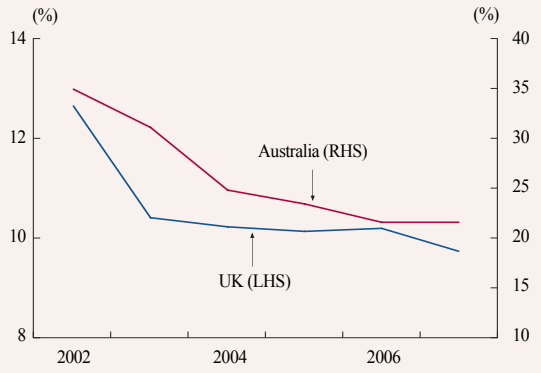
when the subprime mortgage turmoil in the US led to a capital market crunch worldwide. In spite of emergency liquidity assistance by the Bank of England, Northern Rock never fully recovered from the blow and was eventually nationalized.

Second, as capital market development drives the phenomenon of disintermediation, these laws have substantially weakened banks' financial intermediary functions. Entry into force of the consolidated laws has had dampening effects on banks; corporate lending, which is based on their production of information on and monitoring of borrowers, and comprises the core of their financial intermediary function. These effects are attributable to the fact that direct financing by corporations has been on the increase, while due to the complexity of securitization procedures for corporate loans banks have been reluctant to extend them. Meanwhile, the volumes of banks' mortgage loans to households have expanded at a gallop, as it has become easier for banks to control the related credit risks, and to tweak their books to meet capital requirements through securitization.

Third, the risk exposures of large complex financial institutions (LCFIs) have become more serious. Among the consequences of the rapidly-expanding capital markets has been mushrooming of high-risk financial products with complicated trading structures, such as structured bonds and credit derivatives, for which clear evaluation of the related investment risks is often difficult. As these products are primarily designed, sold and invested in by LCFIs,[ii] the level of concentration of risk in these firms has grown sharply.

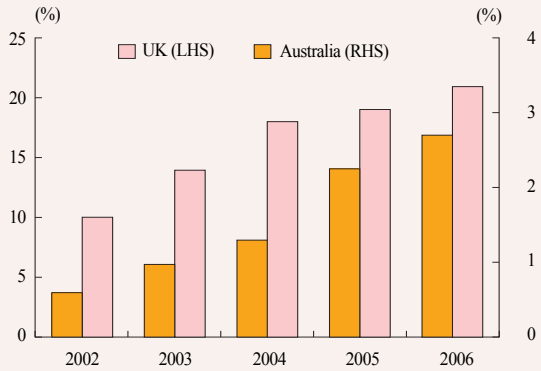
Finally, financial markets' sensitivities to changes in external conditions have also increased overall. As the globalization of capital markets progresses, LCFIs are foraying increasingly into foreign markets, and claiming growing

Shares of corporate loans in total lending in UK and Australian banks



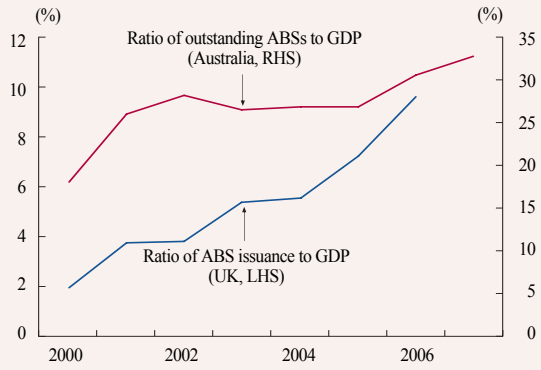
Sources: Bank of England, Reserve Bank of Australia

Global shares of UK and Australian hedge funds



Sources: IFSL, Hedge Fund Research Inc., Reserve Bank of Australia

ABS-to-GDP ratios in UK and Australia



Sources: IFSL, Australian Bureau of Statistics

ii) According to a Bank of England estimate, about 80% of all structured bonds are underwritten and sold by large financial groups (Financial Stability Report, Oct. 2007).

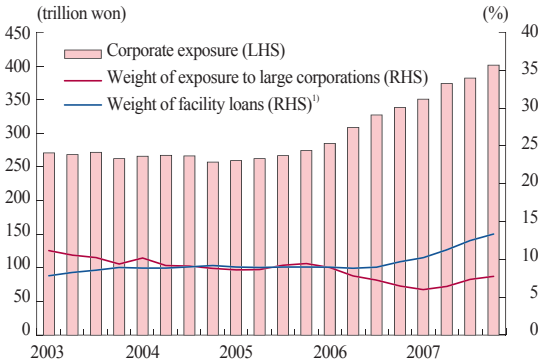
shares there. The interlinkages between financial firms[iii] at home and abroad have become tighter as a result, and external shocks are therefore more likely to trigger volatility in financial markets. The explosive growth of hedge funds as well, facilitated by financial deregulation, can also be a potential market destabilizing factor, as hedge fund operations are not limited by national borders or by any other geographical constraints.

iii) The Bank of England estimates that the coefficient of correlation between stock returns of British banks and those of large foreign financial institutions increased from 0.2 in 1986 to 0.5 in 2006, as a result of exposure of the former to the latter increasing to 2/3 of their equity capital (tier-1 capital basis) (Financial System Risks in the UK, Jul. 2006).

<Figure IV- 7>

Bank exposure to corporate sector

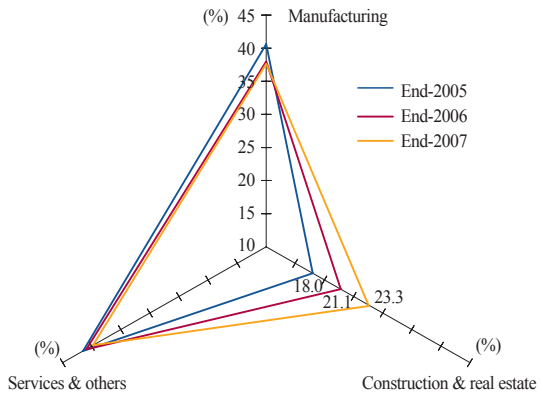
(end of period basis)



Note: 1) Weight of facility loans in total won corporate loans
Sources: Banks' call reports

<Figure IV- 8>

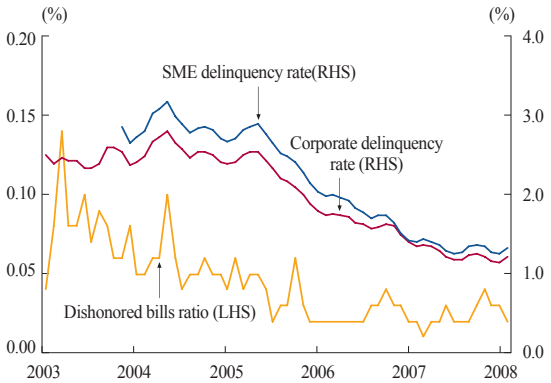
Exposure distribution by industry



Sources: Banks' call reports

<Figure IV- 9>

Dishonored bill ratio[1] and corporate delinquency rates[2]



Note: 1) Amount basis, including electronic-based payments
2) Three-month moving averages
Sources: Bank of Korea, banks' call reports

Credit risk

Credit risk on corporate sector remains low

During 2007, banks' exposure[1] to the corporate sector increased 18.6%, continuing the steep uptrend begun in 2006. This was mainly due to banks' active drives to expand their SME lending amid an upward business cycle and persistent application of tightened housing finance loan regulations including LTV and DTI requirements. Growth in facility loan demand in line with anticipations of business recovery also contributed to banks' increased corporate exposure.

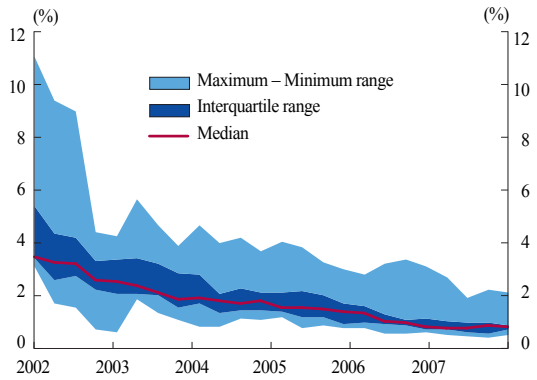
By industrial sector, exposure to the real estate sector increased most noticeably, as the volume of lending to construction and real estate businesses grew sharply. Banks' real estate exposure, which stood at about 18% of total exposure prior to 2005, and 21.1% at the end of 2006, reached 23.3% at end-2007. Exposure to the manufacturing sector also increased in 2007, led primarily by growth in facility loans affected by the upbeat business activity. The comparative share of manufacturing exposure declined, however, as real estate exposure grew at a faster rate.

Looking at soundness indicators related to corporate exposure, the delinquency rates and dishonored bill ratio remained at the lower 1% and 0.05% ranges, respectively. The ratio of substandard and below loans was also maintained at below 1%, while the inter -

1) The concept of "exposure" includes loans (won or foreign currency loans, advances for payment on loss compensation related to payment guarantees, foreign bills bought, credit card receivables, and private placement bonds), CP (including guaranteed notes), acceptances and guarantees outstanding, trust account loans, and merchant bank account loans.

<Figure IV-10>

Substandard and below corporate loan ratios



Sources: Banks' call reports

<Table IV- 3>

Ratio of substandard and below loans by industry

(end of period basis)

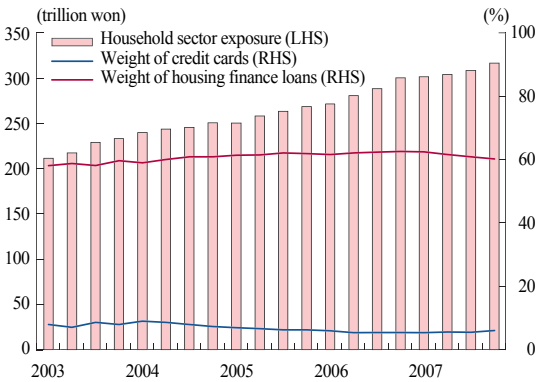
(%)

	2004	2005	2006	2007
Manufacturing	1.7	1.1	1.1	1.0
Construction & real estate	2.4	1.8	1.1	0.9
Services[1)]	2.2	1.7	0.9	0.7
(wholesale & retail)	1.9	1.3	0.7	0.6
(lodging & restaurants)	3.7	4.1	2.8	1.5
(personal services)	4.3	4.4	3.1	1.8
All industries	2.0	1.5	1.0	0.8

Note: 1) Excluding real estate
Sources: Banks' call reports

<Figure IV-11>

Bank exposure to household sector



Source: Banks' call reports

bank disparities in this ratio continued to narrow. In terms of industry, the ratio of substandard and below loans extended to the construction and real estate businesses fell to 0.9%. The ratio also continued to decline, albeit marginally, for loan to service sector(wholesale and retail, and lodging and restaurants, etc.) which is sensitive to business conditions. Considering this corporate exposure soundness and the healthy financial conditions of companies, credit risk on the corporate sector still seems quite low.

Notwithstanding this, growth in unsold new housing inventory,[2)] caused by the recent slowdown in housing markets outside of the capital area, is draining the cash flows of some small and medium-sized construction firms. Given the anticipated global economic slowdown and continued hikes in oil and raw material prices, the corporate profitability is predicted to worsen. There is hence a likelihood of such developments heightening the credit risks on SMEs, which are more sensitive to changes in business conditions.[3)]

Household exposure growth slows

The growth rate in banks' household exposure decelerated noticeably in 2007, dropping from 11.9%

2) At the end of 2007, the number of unsold new houses in regions outside of the capital area stood at 98,000, up 42% from the end of 2006.

Unsold new housing inventories

(10,000 houses)

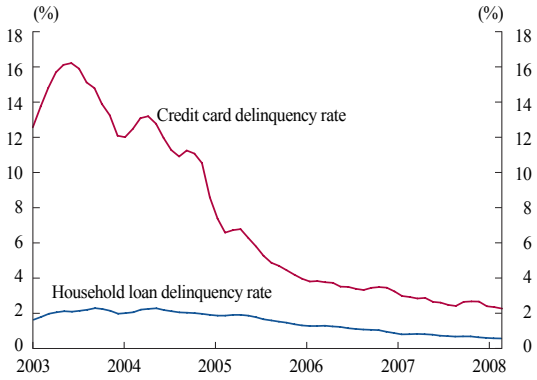
	Dec. 2004	Dec. 2005	Dec. 2006	Dec. 2007	Dec. 2007
Capital area	1.5	1.2	0.5	1.1	1.5
Outside capital area	5.4	4.5	6.9	9.1	9.8

Source: Ministry of Land, Transport and Maritime Affairs

3) A survey on the lending behavior of banks found that the index of credit risk in SME lending rose to 38 in the first quarter of 2008(compared to 9 in the fourth quarter of 2006), and then to 47 in the second quarter of 2008.

<Figure IV-12>

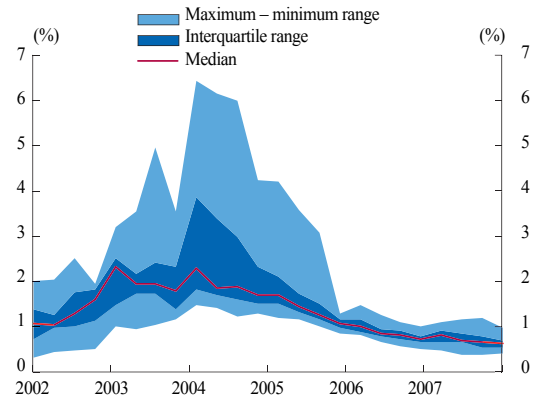
Household sector delinquency rates[1]



Note: 1) Three-month moving average
Sources: Banks' call reports

<Figure IV-13>

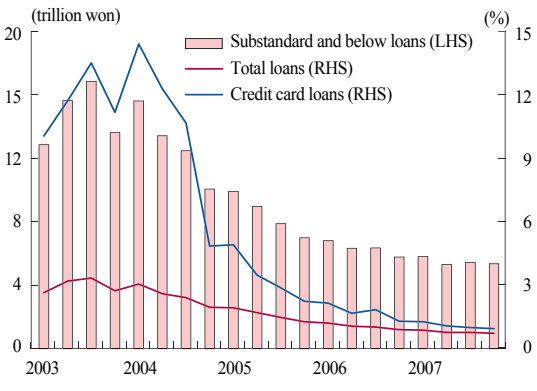
Substandard and below household loan ratios



Sources: Banks' call reports

<Figure IV-14>

Substandard and below loan ratios



Sources: Banks' call reports

in 2006 to 5.3%. As housing prices remained stable and lending regulations such as LTV requirements[4] were continuously imposed, the share of housing finance loans in total household exposure shrank moderately. Meanwhile, the share of credit card receivables widened slightly, as a result of banks' aggressive sales strategies.

Health indicators stayed at sound levels for household exposure, just as they did for corporate exposure. The delinquency rate on household loans stayed below 1%, and the ratio of substandard and below loans also remained stable, ranging from a low of 0.5% to a high of 1.0%. The delinquency rate on credit card receivables, meanwhile, has fallen steadily to the lower 2% range. Considering all of these factors, the credit risk of banks' household exposure is judged to be not high.

However, the weights in overall household lending of both the volume and the number of borrowers[5] of speculative-grade loans rose from their 2006 levels.[6] The repayment burdens of households with residential loans appeared to increase during the year as well, owing to the rise in interest rates. A sudden drop in housing

4) The share of housing finance loans in banks' overall household exposure decreased slightly, from 62.3% at the end of 2006 to 60.0% at end-2007.

5) Household borrowers are assigned one of ten grades, in line with their creditworthiness. Risky borrowers (grades 9 - 10) with high incidence of delinquency and medium-risky borrowers (grades 7 - 8) with relatively high incidence of delinquency are classified as 'speculative borrowers.'

6) Speculative-grade loans and borrowers

(end of period basis)

(trillion won, 10,000 borrowers, %)

	2005	2006	2007			
			1/4	2/4	3/4	4/4
Loan volume	41.7 (10.9)	41.8 (9.8)	44.7 (10.4)	45.1 (10.3)	45.8 (10.3)	46.7 (10.3)
Number of borrowers	144 (16.1)	138 (14.9)	143 (15.4)	145 (15.4)	146 (15.4)	148 (15.4)

Note: Figures in parentheses refer to the shares of speculative-grade loans in total loans and speculative-grade borrowers in total borrowers.

<Table IV- 4>

Increase/decrease in substandard and below loans

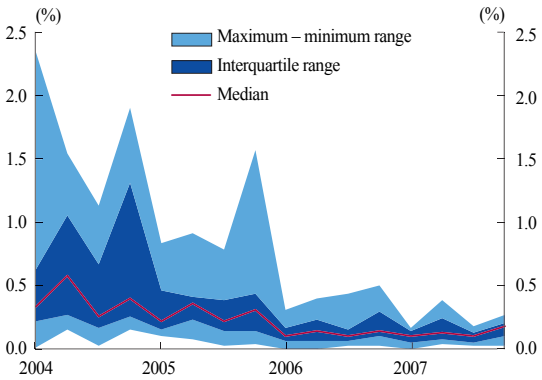
(trillion won)

	2004	2005	2006	2007
New loans	13.7	11.3	9.0	7.6
Disposed	19.4	14.3	10.2	8.0
(redemptions)	(5.0)	(5.5)	(4.1)	(3.0)
(write-offs)	(8.8)	(4.6)	(2.9)	(2.3)
(sales)	(3.2)	(3.3)	(1.3)	(1.3)
Net increase	-	-3.1	-1.2	-0.4
Term-end balance	10.1	7.0	5.8	5.4

Sources: Banks' call reports

<Figure IV-15>

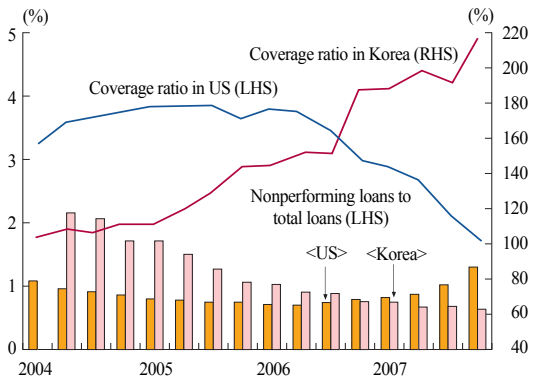
Ratio of bank loans written-off and sold[1)]



Note: 1) [(write offs + sales)/Balance of loans outstanding] × 100
Sources: Banks' call reports

<Figure IV-16>

Comparison of coverage ratios[1)] in Korea and the US



Note: 1) Coverage ratio = (loan loss provisions /nonperforming loans) × 100
Sources: Banks' call reports

prices or hike in interest rates can, therefore, result in a heightening of credit risk on household sector.

Banks' asset soundness improves

Banks' substandard and below loans decreased during 2007, in terms of both volume and their share in total lending, thus suggesting an overall improvement in banks' asset soundness.

Banks' total new bad loans fell by 1.4 trillion won, to 7.6 trillion won. Meanwhile, the volume of bad loans disposed of through redemptions, sales or write-offs totaled 8.0 trillion won, 0.4 trillion won more than that of new bad loans. The substandard and below loan ratio, consequently, dropped from 0.90% at end-2006 to 0.73% at end-2007. The ratio of bad loan written off and sold in banks' total loans also remained stable, at around the 0.2% range.

Meanwhile, there was an increase in the amount of loan loss provisions of 0.9 trillion won, from 9.2 trillion won at the end of 2006 to 10.1 trillion won at end-2007, affected by the rise in the minimum corporate loan loss provision ratio.[7)] As a result, banks' ratio of loan loss provisions to NPLs (the coverage ratio) increased by 28.4 percentage points – from 187.6% at the end of 2006 to 216.0% at end-2007.

Given how the coverage ratio in the Korean banking sector is significantly above the level among US commercial banks, and has been on steady rise, the banking sector's loss absorption capacity seems fairly improved.

7) Effective end-2007, the Financial Supervisory Service updated the minimum loan-loss provision ratio for corporate loans using the new method for expected loss estimation of Besel Ⅱ. Minimum ratios have been upward adjusted, and differentiation in accordance with industrial sector introduced.

Interest rate risk and market risk

Credit risk from corporate sector remains low

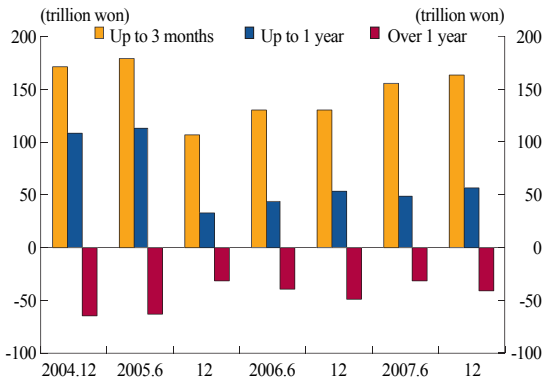
The difference between banks' interest rate sensitive assets and liabilities, as calculated by their rate repricing gaps,[16] had narrowed somewhat by the end of 2007. Compared to the end of 2006, the positive gap between short-term rate-sensitive assets and liabilities had widened, while the negative gap between long-term rate-sensitive assets and liabilities had decreased slightly. The positive gap stood at 164.1 trillion won for the up to 3-month repricing cycles, an increase of 32.8 trillion won compared to end-2006. For the over 1-year repricing cycles, meanwhile, the negative gap registered 40.3 trillion won, a decrease of 8.6 trillion won.

The growth of the positive gap between assets and liabilities with up to 3-month repricing cycles has been caused, on the one hand, by an increase in adjustable-rate loans with short interest rate repricing cycles, and on the other by massive outflows of funds from money market deposit accounts and into CMAs offered by securities firms. Meanwhile, the shrinkage in the negative gap between assets and liabilities with repricing cycles over one year has been due to the fact that the volume of long-term fixed-rate loans has risen, driven by small and medium-sized business loans, while at the same time bank issuance of bonds with long-term maturities has also risen.[17]

<Figure IV-17>

Repricing gap trends

(based on local currency)



Notes: 1) Assets and liabilities in the "up to 1 year" classification include those belonging to the "up to 3 months category."
2) Rate-sensitive assets - rate-sensitive liabilities
Sources: Banks' call reports

<Table IV- 5>

Repricing gap schedule

(as of end-June 2007; based on local currency)

(trillion won)

	0-3 months	3-6 months	6-12 months	Over 1 year
Interest-bearing assets (a)	499.9	77.1	77.9	125.6
Interest-bearing liabilities (b)	335.9	109.6	152.5	165.9
Repricing gap (a-b)	164.1(+) <32.8>	32.5(-) <15.1>	74.6(-) <15.2>	40.3(-) <-8.6>

Notes: 1) The + and - signs in ( ) indicate the directions of the gaps, with a (+) meaning an asset sensitive gap and a (-) a liability sensitive gap.
2) Figures in < > are the changes in repricing gaps since the end of Dec. 2006.
Source: Bank of Korea

16) Rate-sensitive assets minus rate-sensitive liabilities in each time bucket.
17) The volume of banks' won-denominated securities (those monitored for interest rate risk assessment only) decreased by 7.3% in 2007 compared to the end of 2006. However, the share of securities with over 1-year repricing cycles increased by 8.8%.

<Table IV- 6>

Banks' interest rate VaR

(trillion won)

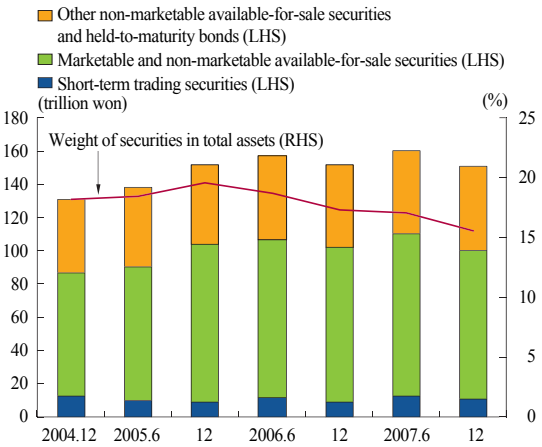
	Dec. 2005	Dec. 2006 (a)	Dec. 2007 (b)	b-a
VaR(A)[1)]	3.6	4.8	2.3	-2.5
BIS capital (B)	64.6	75.5	85.1	9.6
A/B(%,%p)	5.5	6.4	2.7	-3.7

Note: 1) Interest rate shocks calculated based on five-year observed values until end-2006, but 200bps applied for Dec. 2007
Source: Bank of Korea

Interest rate VaR,[18)] a measure of banks' interest rate risk, fell during 2007, despite the widened repricing gap between assets and liabilities with repricing cycles of up to 1 year-from 4.8 trillion won at the end of 2006 to 2.3 trillion won at end-2007. This owed to the decreased repricing gap between assets and liabilities with repricing cycles longer than one year, which are relatively more exposed to this risk, and moreover to the decrease in interest rate shock.[19)] As a result, the ratio of VaR to BIS capital also dropped 3.7% points from the year before, to 2.7%. This is well below the BIS recommended maximum (20%) and the VaR among large US banks (7.9%)[20)] as well.

<Figure IV-18>

Securities investment volume



Note: Bank accounts, based on closing balances
Sources: Banks' call reports

Increase in market risk of bond investment

At the end of the 2007, banks' investment in securities amounted to 150.7 trillion won, a decrease of 1.3 trillion won from end-2006, and the share of securities in total investment assets had fallen 1.8% points to 15.6%. Due to the conservative asset management strategies during the second half, in response to the increased financial market volatility, investment in short-term trading securities, and in marketable and non-marketable available-for-sale securities exposed to market risk, totaled 100.2 trillion won. This was 2.3 trillion won less than at the end of 2006.

<Table IV- 7>

VaR of won-denominated bonds held by commercial banks

(trillion won)

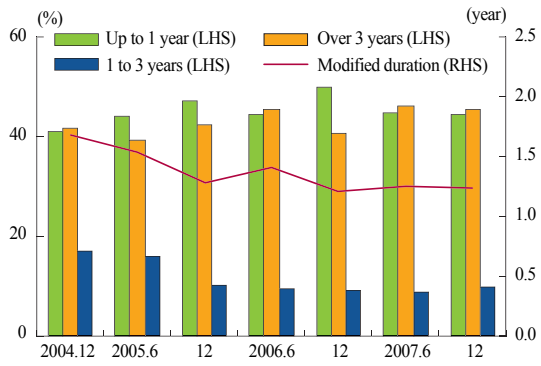
	End-2005	End-2006 (a)	End-2007 (b)	b-a
VaR[1)]	0.39	0.27	0.41	0.14
(exposure)	102.6	95.9	92.1	-3.8
(interest rate volatility)[2)]	5.6	3.5	6.6	3.1
(duration)	1.29	1.21	1.25	0.04

Note : 1) 10-day holding period, confidence level 99%
2) Treasury bonds (3-year), EWMA-based daily volatility (bp)
Source: Bank of Korea

18) Calculated using the standard VaR method proposed by the BIS (Bank for International Settlements)
19) The interest rate shock chosen is the more conservative (i.e., more severe) of the five-year observed value or 200bps. The VaR at the end of 2006 was calculated using the five-year observed value, as for this period it exceeded 200bps. However, the VaR at end-2007 was calculated using 200bps, as the observed value was lower during this period. When calculated applying the same interest rate shock as for end-2006, the end-2007 VaR would total 3.7 trillion won.
20) The five largest US commercial banks: BOA, JP Morgan Chase, Citibank, Wachovia and Wells Fargo

<Figure IV-19>

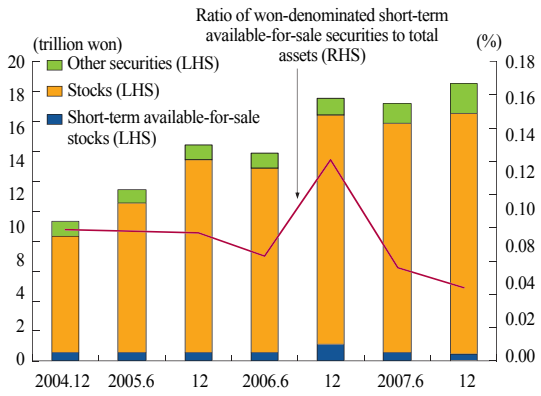
Duration and maturity distribution of won-denominated bonds



Sources: Bank of Korea, banks' call reports

<Figure IV-20>

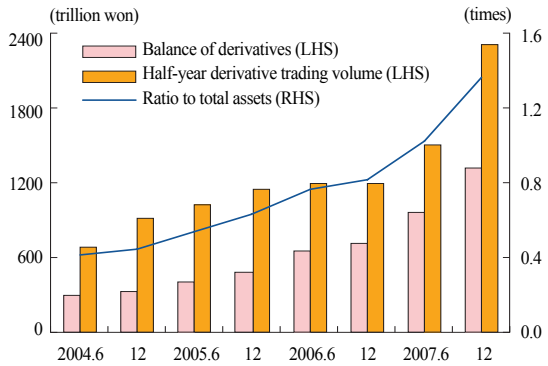
Stock investment trends



Sources: Banks' call reports

<Figure IV-21>

Trading volume of derivatives and their ratio to total assets[a)]



Note: 1) Bank accounts, end-of-month balance basis
Source: Bank of Korea, Banks' call reports

Meanwhile, there was an increase from the end of 2006 in the VaR of banks' won-denominated bonds, which reached 0.41 trillion won–up 0.14 trillion won for the year. Occurring despite the decline in risk exposure related to bond investment (due to expanded bond sales, especially of short-term bonds), this increase in VaR is explained by the lengthening in overall duration, and by the increase in interest rate volatility.

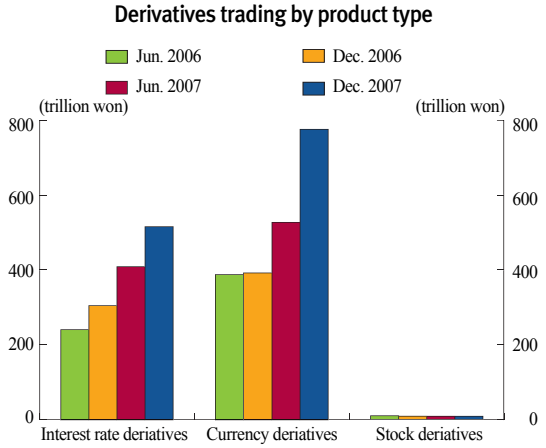
Stocks held for short-term trading comprise a mere 0.04% of banks' total investment assets. They amounted to 0.4 trillion won at the end of 2007, less than half their volume (1.1 trillion won) the year previous. Despite the high stock price volatility caused by the US subprime mortgage crisis, market risks associated with stock investment appear negligible, as the risk exposure related to stock investment remains small.

Derivatives trading on a sharp rise

Commercial banks' derivatives balance totaled 1,313 trillion won at the end of 2007, up 84.1% from one year earlier (713 trillion won). As a consequence, the proportion of banks' derivatives outstanding in their total assets had climbed sharply — from 0.82 at end-2006 to 1.36. This is, however, still far below the level among US commercial banks (16.8 at the end of 2007).

By type of trade, forward exchange trading with exporters and investors with overseas securities, and currency-related derivatives trading including currency swaps with foreign arbitrage traders, gained massively in volume. Trading in interest rate-related derivatives for the purpose of hedging interest rate risk also increased noticeably, with the recent growth in bank bond issue volume. However, the volume of trading in

<Figure IV- 22>



Sources: Banks' call reports

stock-related and credit derivatives, remains negligible.

The sudden and massive expansion of derivatives markets, facilitated by the accelerated financial sector opening and regulatory liberalization, has had the effect of strengthening the correlation between financial markets, including the bond and foreign exchange markets. As a result, the possibility of cross-border instability contagion between domestic and foreign financial markets is also growing.

Profitability

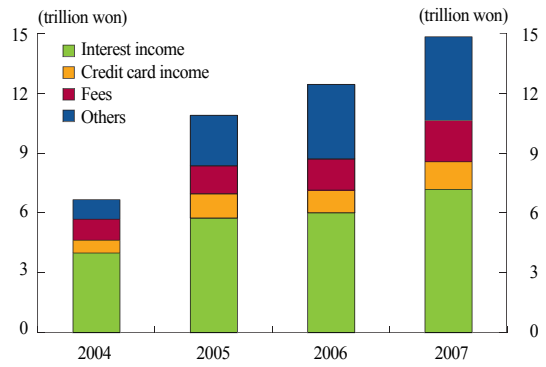
Net income increases

In 2007, commercial banks' net income before taxes hit an all-time high of 14.9 trillion won, up 20.2% from 12.4 trillion won a year earlier.[21] By sector of income, in spite of the narrowing spread between lending and deposit interest rates,[22] net interest income increased, thanks to the constant sharp expansion of interest-earning assets.[23] An increase was also seen in sales commission revenue from beneficiary certificates and bancassurance products. Investment-securities-related net income was boosted by massive profits made from sales of LG Card stocks, acquired through debt-to-equity conversion programs,[24] and net income expanded in the credit card sector as well.

Commercial banks' ROA ratio edged up only moderately to 1.08% from 1.05% a year earlier, due to a large expansion of total assets coinciding with that of net income during this period. Meanwhile, these ratios

<Figure IV-23>

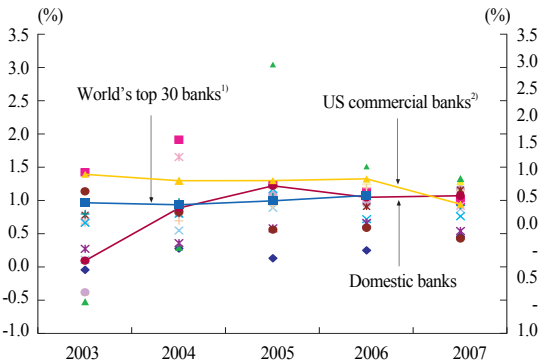
Changes in banks' net income before taxes



Sources: Banks' call reports

<Figure IV-24>

ROA trends of Korean and foreign commercial banks



Notes: 1) Simple average of ROA among the world's top 30 banks (based on size of tier-1 capital as of end-2006)
2) Assets more than US$ 10 billion
Sources: Banks' call reports, US FDIC, The Banker

21) The net income after taxes grew at a more moderate rate of 13.2%, owing to the increased corporate tax burden on some banks.

22) Spread between bank lending and deposit interest rates[1)]

(%)

	Dec. 2004	Dec.2005	Dec.2006	Dec.2007
Newly extended	2.02	1.54	1.51	1.17
Outstanding	2.35	2.46	1.98	1.93

Note : 1) Weighted average of interest rates on loans - weighted average of interest rates on saving deposits (excluding demand deposits and settlement-type savings deposits)
Source: The Bank of Korea

23) Changes in banks' interest-earning assets

(trillion won)

	2004	2005	2006	2007
Interest-earning assets[1)]	595.1	628.0	697.2	782.5
(Increase/Decrease)	(26.7)	(32.9)	(69.2)	(85.3)

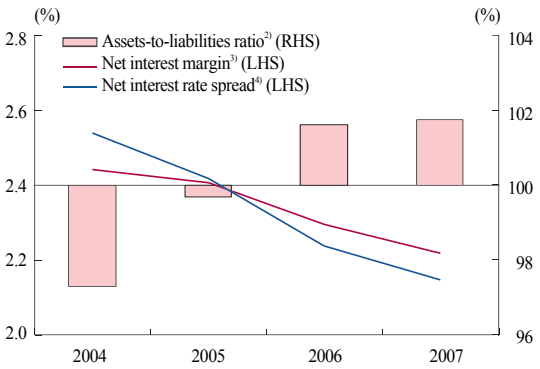
Note : 1) Excluding credit card loans (based on average annual balances)
Sources: Banks' call reports

24) During 2007, banks' investment-securities-related income, including proceeds from sales of stock acquired through debt-to-equity conversion programs, increased from 2.7 trillion won a year ago to 3.2 trillion won.

at commercial banks are close to the corresponding figures at large foreign banks, moving within a very sound range.

<Figure IV-25>

Net interest margin and net interest rate spread[1]



Notes: 1) Excluding credit card sector
2) Interest-earning assets / Interest-bearing liabilities
3) (Interest income - Interest expense) / Interest-earning assets
4) (Interest income / Interest-earning assets) - (Interest expense / Interest-bearing liabilities)
Sources: Banks' call reports

Nominal net interest margin shrinks

Commercial banks' nominal net interest margin on interest-earning assets declined 0.07 percentage points from the previous year to 2.22%, continuing its downtrend begun in 2003.[25] The net interest rate spread, corresponding to yield on interest-earning assets (interest income / interest-earning assets) minus interest expense rate (interest expense / interest-bearing liabilities), also narrowed. With the net interest rate spread remaining consistently smaller than the nominal net interest margin, the gap between the two widened from 0.05 percentage points a year earlier to 0.07 percentage points. What this suggests is that the effect of the shrinking nominal net interest margin, eroded by competitive lending rate reduction and competitive wholesale funding at high interest rates,[26] has been attenuated by an improvement in interest income driven by asset growth.

Profitability may possibly decline

As income from sales of investment-securities, including securities acquired in the context of corporate restructuring, is likely to continue to boost the income

25) On the other hand, the real net interest margin, which takes into account the ratio of overhead expenses for the interest income sector and the ratio of loan loss provisions to interest-earning assets, widened marginally, due to the decrease in the amount of loan loss provisions compared to 2006 when there was a sharp increase in loan loss provisioning against NPLs.

26) The share of low-cost deposits (demand deposits and settlement-type savings deposits) in commercial banks' total deposits has steadily declined, falling from 24.9% at the end of 2005 to 23.6% at the end of 2006 and 20.5% at the end of 2007.

of banks whose asset quality remains sound, their current high levels of net income are expected to continue for the foreseeable future.

However, in conditions where both banks' capacity to rapidly expand their assets and their capacity for further cutting loan loss provisions or operating expenses have declined, the potential for additional profit growth appears less than in the past. Also, should the current uncertainty in the international financial markets deepen, in the aftermath of the US subprime turmoil, this may well have a negative effect on the Korean markets as well, also damaging banks' profitability. Fortunately, however, the volume of domestic banks' investment in credit derivative-related structured financial products whose underlying assets consist of subprime mortgage loans is not excessively large. Hence, domestic commercial banks seem likely suffer only indirect negative effects on their profitability from the ramifications of the subprime meltdown.[27)]

27) Credit derivative-related structured products (CDOs and synthetic CDOs, etc.) account for only 0.66% of investment vehicles held by domestic commercial banks, and about 60% of related losses were already reflected in their 2007 earnings.

Capital adequacy

BIS capital ratio declines

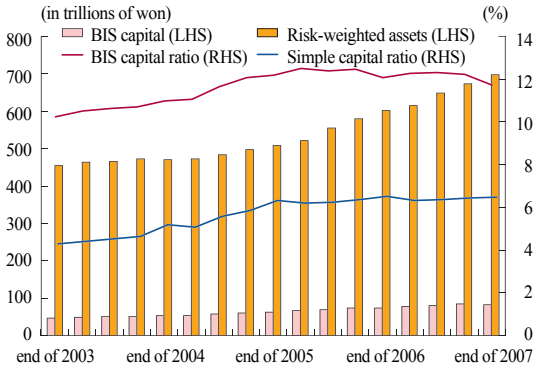
At the end of 2007, commercial banks' BIS capital ratio stood at 11.96%, down 0.36 percentage points from the end of the previous year. This decline, which occurred in spite of the all-time high in banks' net income during this period, is attributable to the rapid increase of risk-weighted assets, especially in the business loan segment, which outstripped the pace of income growth. However, compared with the corresponding ratio among US commercial banks and large overseas banks, Korean banks' BIS capital ratio still remains within a fairly healthy range.

With the New Basel Capital Accord going into effect in 2008, extending the scope of risk management to include operational risks and unused lines of credit, there may, nevertheless, be a further decline in Korean banks' BIS capital ratio.[28] Yet, as banks are expected to respond proactively to the new rules by increasing their capital, retaining profits[29] and expanding supplementary capital, and other such strategies, the erosion of the capital ratio is likely to be minor.

Meanwhile, a stress test recently conducted on Korean banks indicated that their BIS ratios would remain above an adequate level (8%) even under a massive external shock. The banking system's shock absorption

<Figure IV-26>

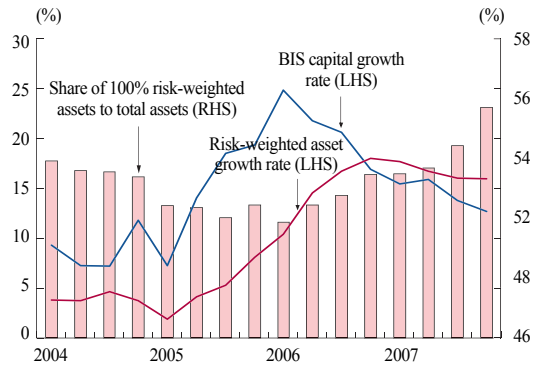
Commercial banks' BIS capital ratio



Sources: Banks' call reports

<Figure IV-27>

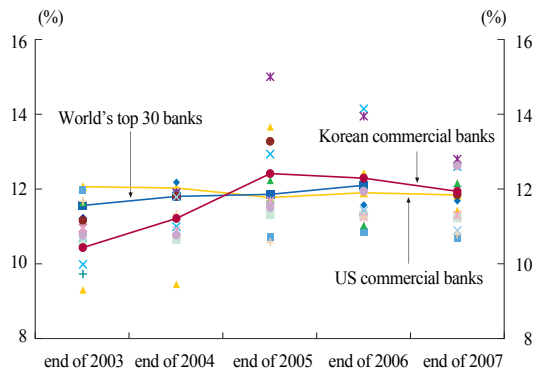
Changes in BIS capital and risk-weighted assets



Note: 1) Percentage change from the corresponding period of the previous year
Sources: Banks' call reports

<Figure IV-28>

BIS ratio trends of Korean and foreign commercial banks

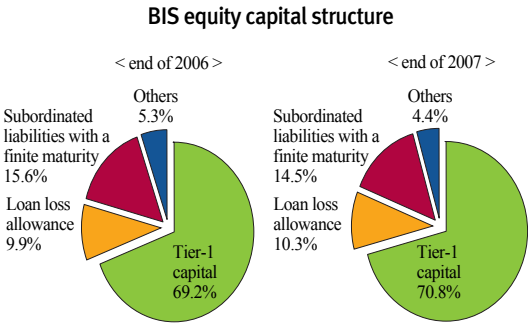


Notes: 1) Simple average of BIS ratios among the world'top 30 banks (based on the size of Tier-1 capital as of the end of 2006)
2) Banks with total assets more than US$ 10 billion
Sources: Banks' call reports, US FDIC, The Banker

28) The New Basel Capital Accord is projected to result in an approximately 1 percentage point decline in Korean banks' BIS capital ratio.

29) Commercial banks' dividend payout ratio (dividend paid/ net earnings) for the fiscal year 2007 is expected to average only 25%, substantially lower than the level a year earlier (36%). The total dividend payment is also forecasted to decrease from the previous year (3.2 trillion won) to 2.6 trillion won.

<Figure IV-29>



Sources: Banks' call reports

capacity, therefore, appears to be sound overall.[30)]

BIS capital structure improves

At the end of 2007, Tier-1 capital accounted for 70.8% of commercial banks' total capital based on BIS standards, up 1.6 percentage points from a year before. Two factors contributed to this improvement in the capital structure: a sharp surge in banks' net income during the period gave a significant boost to their Tier-1 capital, while a decrease in banks' issuance of subordinated debt, whose attractiveness as a capital instrument declined due to high interest rates, resulted in the reduction of the relative share of Tier-2 capital. Korean commercial banks' BIS Tier-1 capital ratio, currently estimated at 8.47%, is within a sound range, very near the corresponding ratio among large overseas banks.[31)]

30) For more details on this topic, see '<Box IV-2> Development of a financial system stress testing model (BOKST-07) and test results'.

31) Equity capital structure comparison of Korean and foreign commercial banks

(%)

	Korea (Dec. 2007)	US[1)] (Dec. 2007)	World's top 30 banks[2)] (Dec. 2006)
BIS Tier-1 capital ratio	8.47	8.67	8.82[3)]
BIS capital ratio	11.95	11.86	12.12[3)]
Tier-1 capital/equity capital	70.8	73.1	72.8[3)]

Notes : 1) Banks with total assets more than US$ 10 billion
2) Ranked by The Banker (based on the size of Tier-1 capital as of the end of 2006)
3) Simple average of relevant ratios of respective banks

Sources: Banks' call reports, US FDIC, Bankscope

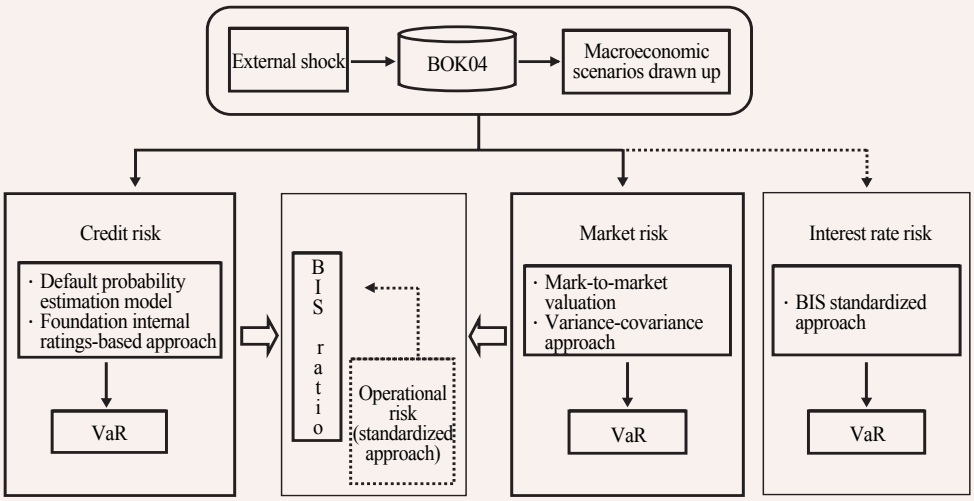
<Box Ⅳ-2>

Development of a financial system stress testing model (BOKST-07) and test results[i)]

To assess the effect of an exceptional but plausible shock, such as a sudden and sharp change in the situation of the financial markets or deterioration of macroeconomic conditions, on the stability of the Korean financial system, the Bank of Korea developed a financial system stress model (hereinafter "BOKST-07 model") and conducted a stress test based on this model.

The BOKST-07 model evaluates the stability of the financial system by estimating potential losses that may be sustained by financial institutions in the event of an external shock, ranging from a plunge in stock prices to an oil price hike or fall in property prices, and the resulting changes in their capital ratios based on the new BIS standards. The model uses BOK04, the macroeconometric model developed by the Bank of Korea to set up macroeconomic scenarios, and the risk measurement method proposed under the New Basel Capital Accord to measure the size of risk run by the financial system.

Structural diagram of BOKST-07



The stress test conducted on Korean banks' portfolios at the end of 2007, with regard to six different categories of shock; namely, interest rates, stock prices, exchange rates, oil prices and the global economy, found that their BIS ratio would decline by at least 0.53 percentage points and up to 2.22 percentage points from the baseline value (end of 2007). However, under all scenarios, banks' capital ratio remained at least 8%.

i) For more information on this subject, refer to Appendix 2 herein.

2. Soundness of non-bank institutions

Mutual savings banks

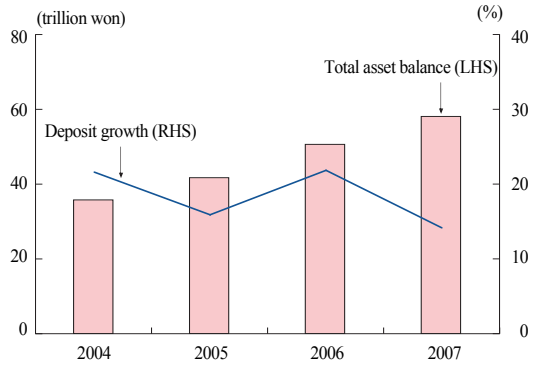
Asset growth continues

As of the end of 2007, the total assets of mutual savings banks (108 banks) amounted to 58.0 trillion won, a year-on-year increase of 14.2%. The high rate of asset growth was fueled by large inflows of deposit money to these institutions, which offer comparatively higher interest rates, enabling them to expand their securities investment and loan assets on a massive scale.

During 2007, the volume of securities held by mutual savings banks rose a whopping 1.2 trillion won, as they sharply expanded their stock investment to capitalize on the bullish market and also increased their holdings of government bonds eligible for inclusion in reserve assets. As a result, the share of securities in these institutions' total assets climbed 1.2%ps from a year earlier, to 8.3%. Boosted by a large increase in real estate-related lending, meanwhile, the volume of loans extended by mutual savings banks jumped 4.4 trillion won, up 10.4% from end-2006. However, the share of loans in their total assets fell by 2.7%ps, due on the one hand to the stiffening of rules on PF loans[32] and, on the other, to the massive increase in their securities investment.

<Figure IV-30>

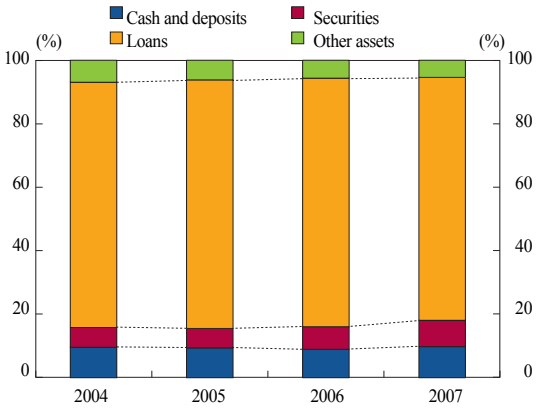
Mutual savings bank total assets



Source: Financial Supervisory Service

<Figure IV-31>

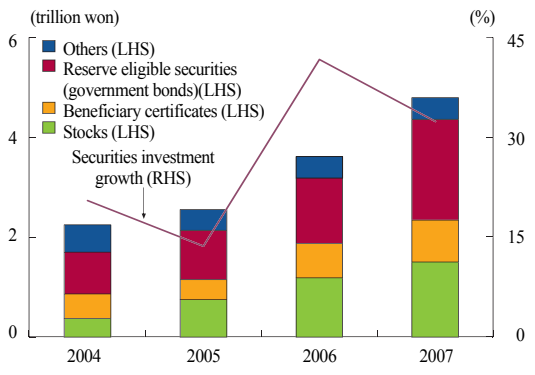
Asset portfolio distribution



Source: Financial Supervisory Service

<Figure IV-32>

Securities investment

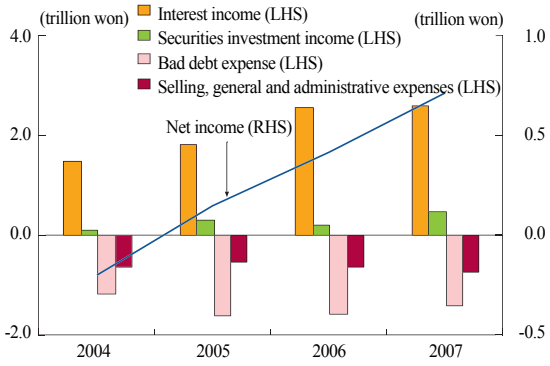


Source: Financial Supervisory Service

32) The Financial Supervisory Service raised the minimum loan-loss provision rate on PF loans extended by mutual savings banks twice in 2007, on April 6 and May 27 (regular loans: 0.5% → 0.5-3%, doubtful loans: 2% → 7-10%, substandard loans: 20% → 30%).

<Figure IV-33>

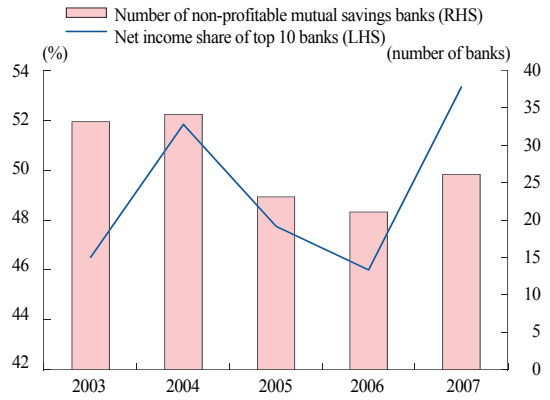
Changes in net income



Source: Financial Supervisory Service

<Figure IV-34>

Net income share of top 10 mutual savings banks, and number of non-profitable savings banks



Source: Financial Supervisory Service

<Table IV- 8>

Asset health and capital adequacy

(%)

	End-2004	End-2005	End-2006	End-2007
Loan delinquency rate	22.8	20.1	16.2	14.7
Substandard and below loan ratio	6.5	7.2	5.3	4.9
BIS capital ratio	7.0	7.9	9.0	9.7

Source: Financial Supervisory Service

Profitability upswing and improved asset quality

Mutual savings banks' net income for calendar year 2007 totaled 715.5 billion won, an increase of 70.6% from the year before (422.3 billion won). This earnings jump was the combined effect of an increase in securities investment income of 255.1 billion won, on the back of the stock price boom, and a reduction in required loan-loss provisions of 181.7 billion won, thanks to a noticeable improvement in asset quality. In the meantime, in spite of the steep uptrend in mutual savings banks' net income, the phenomenon of earnings polarization among individual banks only worsened. The share of total net income accounted for by the top ten banks[33] grew from 46.0% in 2006 to 53.3%, while the number of banks posting losses increased from 21 to 25 over the same period.

The quality of mutual savings banks' assets continued to improve, thanks to their active efforts to liquidate bad loans coupled with the expansions in their loan assets. The ratios of late payments and substandard and below loans fell 1.5%ps and 0.4%ps respectively from the end of 2006 – to 14.7% and 4.9% at end-2007. However, the ratio of late payments on PF loans, whose volume has expanded greatly recently, climbed rather steeply from the second half of 2007.[34] As continuing growth in unsold new apartment inventories in the regional markets outside the capital area, or a persistent slump in the overall housing sector may drive up PF loan delinquencies and defaults, mutual savings banks may in the future have to contend with the negative financial or operational consequences of

33) In terms of net income

34) According to monitored data, the ratio of late payments on PF loans issued by mutual savings banks rose from the mid-10% range in the first half of 2007 to the 20% range in the second half.

<Table IV- 9>

Savings bank group statistics

(number of banks/groups, trillion won, %)

	End-June 1998	End-June 1999	End-June 2000	End-June 2006	End-Sep. 2007
Number of groups	2	3	6	8	8
Number of affiliated banks	4	6	12	19	20
Total assets	0.9	1.2	3.0	17.6	22.3
Affiliated savings bank share in total assets	2.6	3.9	12.3	38.0	40.6

Source: Financial Supervisory Service

such developments.

Since 1998, a growing number of mutual savings banks have been merging into larger operations, in bids to expand their presences geographically and boost their competitiveness. Savings banks operating as affiliates belonging to large groups have greater financial and operational resources at their disposal, but are also more exposed to external variables such as real estate and securities market conditions, due to their high volumes of PF loans and stock investment.[35)]

35) For more information on this subject, see 'Mergers and affiliations among mutual savings banks, and their implications' in <Box IV-3> herein.

<Box IV-3>

Mergers and affiliations among mutual savings banks, and their implications

Mutual savings bank groups first appeared in Korea in January 1998. The number of mutual savings bank groups, which totaled six at the end of 2000, had increased to 20 by end-2007, the result of a series of acquisitions of small unsound banks by larger savings banks in the intervening years. Savings banks operating as banking groups enjoy advantages over their non-affiliated peers, in terms both of funding and of asset management. They are exerting increasing influence on overall financial system stability, as they are quickly catching up in asset size with the regional commercial banks.

(Funding and asset management among group-affiliated mutual savings banks)

Mutual savings banks become larger operations by merging with other banks, and can, in the process, gain greater market awareness. Thanks to their steadily expanding networks of branches, larger staffs of trained manpower and abilities to offer comparatively higher interest rates, the deposit volume at group-affiliated mutual saving banks is currently growing at a rate about twice that at their non-affiliated counterparts.

Deposit growth

(Changes from corresponding periods of perious years)

(%)

	June 2004	June 2007
Group-affiliated	34.4 <5.96>	18.9 <5.45>
Stand-alone	18.0 <5.71>	9.9 <5.33>

Note: Figures inside < > are the weighted average interest rates.

The 20 group-affiliated savings banks, having twice as many banking offices on average (4.2) as non-affiliated, standalone savings banks(2.1), are also equipped with better operational infrastructures. Their high-risk, high-return asset management strategies, centered around real estate development PF loans and securities investment, also distinguish them from standalone mutual savings banks with traditional business models focused on loans to households and self-employed small business owners.[i] Group-affiliated mutual savings

Asset portfolio distribution and volatility

(%)

		End -June 2005	End-June 2006	End-Sep. 2007	Return volatility[3]
Group-affiliated	Securities	5.8	11.1	12.2	4.04
	Stocks, beneficiary certificates[2]	41.4	46.0	64.1	-
	Loans	82.7	77.1	78.5	1.57
Stand-alone	Securities	6.9	7.1	5.4	3.09
	Stocks, beneficiary certificates[2]	27.7	27.6	38.0	-
	Loans	80.7	80.9	83.7	1.44

Notes: 1) % share of total assets
2) % share of total securities holding
3) Average standard deviation of returns on securities and weighted loan interest rates for the period 2002-2006 (fiscal year basis)

i) The decline in the volume of household loans observed since 2002 has been sharper among group-affiliated than non-affiliated banks. Between end-June 2003 and end-June 2007, the share of household loans in group-affiliated savings banks' total assets tumbled from 25.9% to 7.8%.

banks, most of which are bold securities investors, have stepped up their investments in stocks and beneficiary certificates to capitalize on the recent stock price inflation, with the result that the share of these assets in overall securities holdings rose to 64.1% at end-Sep. 2007, from 41.4% at end-June 2006. The share of securities in the overall asset portfolio for this group has thus increased massively, from 5.8% at the end of June 2005 to 12.2% at end-September 2007. This has thus also driven up the volatility of return for these banks; at 4.04 currently, it is well above the level for their standalone counterparts (3.09).

(Operating conditions among group-affiliated savings banks)

Despite their generally bold business approaches, in terms of operating conditions group-affiliated mutual savings banks compare fairly well with their non-affiliated counterparts, with their profitability, asset quality and capital adequacy all remaining within healthy ranges. In terms of profitability, group-affiliated savings banks' ROA improved dramatically between 2003 and 2006, from-0.28% to 2.03%, boosted by a sharp increase in disposition and valuation gains on securities thanks to successful portfolio diversification efforts, coupled with growth in loan interest income driven by their expanding PF loan volumes. Among standalone savings banks not affiliated to banking groups, ROA improved only moderately over the same period – from 0.24% to 0.83%.

Concerning asset quality, the ratio of substandard and below loans among group-affiliated mutual savings banks stood at 3.59% at the end of June 2007, significantly lower than the level among their standalone counterparts (6.35%). This owed not only to groups' liquidations of the non-performing assets of banks they absorbed with help from the Deposit Insurance Fund,[ii] but also to their drastic cutting of nonperforming household loans, with a particularly large reduction in small consumer loans. In terms of capital adequacy, meanwhile, with their enhanced market awareness, group-affiliated savings banks successfully increased their share capitals through rounds of capital increases[iii] and realized sizeable net earnings, boosting their BIS ratio to 10.2% – 1 to 2%ps higher than the average among standalone savings banks.

Performance indicators of group-affiliated and stand-alone savings banks

(100 million won, %)

	End-June 2004			End-June 2007		
	Group-affiliated (A)	Stand-alone (B)	Difference (A-B)	Group-affiliated[1] (C)	Stand-alone (D)	Difference (C-D)
Ratio of substandard and below loans	5.88	6.23	-0.35	3.59	6.35	-2.76
BIS ratio	7.73	8.48	-0.75	10.21	8.26	1.95
ROA[2]	-0.28	0.24	-0.52	2.03	0.83	1.20
Net income[2]	-283	477	-760	4,032	2,528	1,504

Notes: 1) Twenty savings banks affiliated with banking groups as of the end of September 2007
2) Fiscal year basis (July 2003 - June 2004, July 2006- June 2007)

ii) Before the sale of an insolvent savings bank, the Deposit Insurance Corporation covers any shortfall in its net assets and contributes into its capital account to raise its BIS ratio to the required 8% level.

iii) Currently five out of the eight publicly-traded savings banks belong to banking groups. Between June 2004 and September 2007, funds raised through capital increases totaled 439.9 billion won among group-affiliated savings banks(20 banks), far exceeding the corresponding amount of 204.6 billion won among standalone savings banks (88 banks).

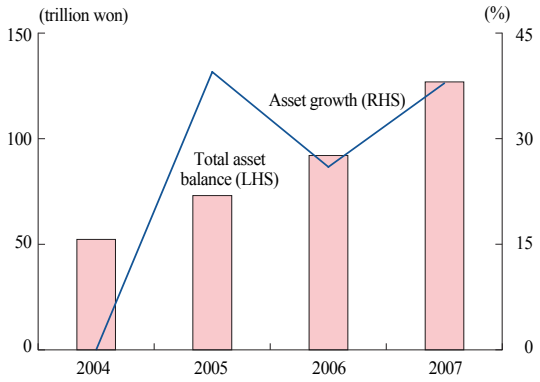
(Assessment)

Merging into groups has enabled mutual savings banks to gain greater visibility and market awareness, and to exchange manpower and share customer credit information with other group members, as well as helping them improve their asset quality and profitability through diversification of their assets. Through their takeovers of unsound savings banks, the restructuring of those banks essential to return them to viability has also been accelerated. However, the phenomenon is not without negative ramifications. Due to their high-risk, high-return asset strategies focused on real estate PF loans and securities, group-affiliated savings banks face potentially higher concentration and market risks. Also problematic is the straying of these organizations away from the original purpose of mutual savings banks, in their tendencies to shun lending to low-income borrowers or self-employed small business owners who, although less creditworthy than customers banking with commercial banks, nevertheless satisfy the minimum loan credit standards.

To gain greater competitiveness in the future, group affiliated savings banks will need persistent efforts to improve their asset health, for example by setting up more efficient risk management systems, adopting advanced loan review techniques enabling analysis of borrowers' future repayment capacities, etc.

<Figure IV-35>

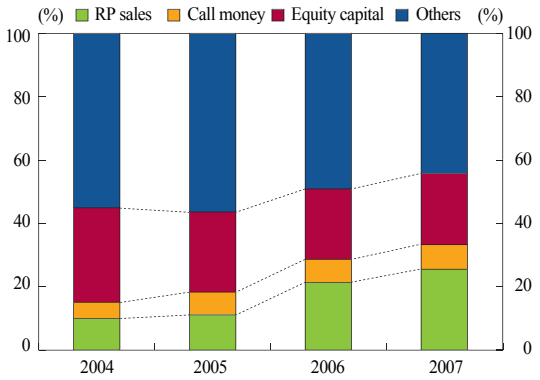
Securities company total assets



Source: Financial Supervisory Service

<Figure IV-36>

Funding sources



Source: Financial Supervisory Service

<Table IV-10>

Asset portfolio distribution

(trillion won)

	End-2004	End-2005	End- 2006	End-2007
Cash and deposits	15.8	21.7	18.9	23.3
Securities	22.4	32.6	51.2	72.7
(stocks, beneficiary certificates)	5.1	5.7	6.7	10.1
(government bonds)	9.9	15.4	26.2	41.7
(non-traditional securities)	3.2	7.6	11.6	12.1
Loans	5.2	8.0	10.8	18.2
(brokers' loans)	1.3	4.0	4.8	10.6
Other assets	9.0	10.8	12.0	12.7
Total	52.4	73.1	92.9	126.9

Source: Financial Supervisory Service

Securities companies

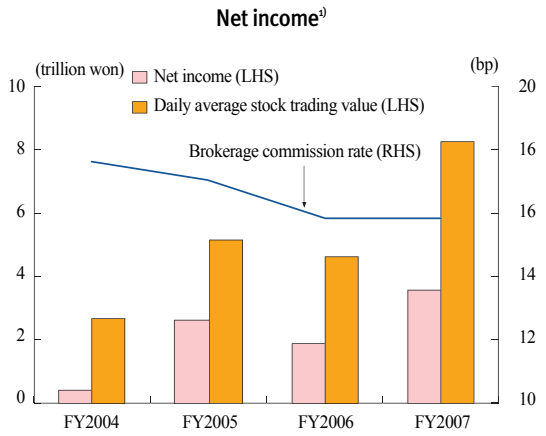
Assets surge

At the end of 2007, securities companies' total assets stood at 126.9 trillion won, up a staggering 36.7% (34.1 trillion won) from a year earlier. This exponential asset growth was driven by a massive increase in deposit flows into CMAs,[36] resulting in a commensurate increase in securities holdings and brokers' loans. This raised the ratio of securities companies' total assets to those of commercial banks from 10.6% at end-2006 to 13.1%. Given the expansionary drives under way among securities companies, ahead of entry into force of the Capital Market Consolidation Act, accelerated asset growth seems likely to continue for the foreseeable future.

The share of stocks in securities companies' total assets edged up 1.7%ps to 57.3% by the end of 2007. There was increased investment in RP-type CMAs on the one hand, and on the other, amid stock price buoyancy, growth in government bond holdings (15.5 trillion won, 59.2%) and in holdings of stocks and beneficiary certificates for proprietary trading (3.4 trillion won, 51.6%). Meanwhile, the expanded share of short-term funding among securities companies, more particularly funding through RP-type CMAs, has made these companies potentially more vulnerable to liquidity risk, as it magnifies their exposure to market conditions. The

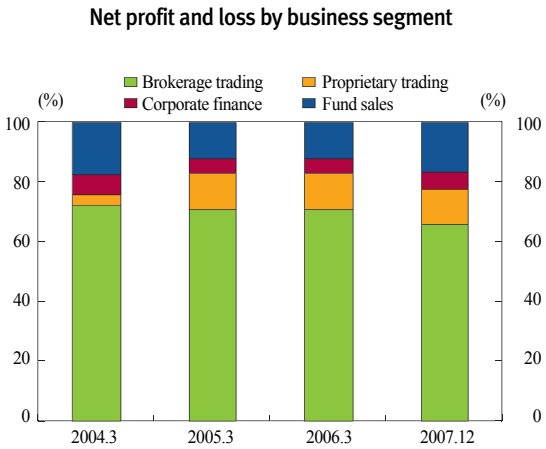
36) While allowing unlimited withdrawals and deposits just like a current account, CMAs offer significantly higher interest rates than those (0.68%, as of Dec. 2007) on savings accounts at deposit banks – ranging typically from 4.20% to 5.55%. At the end of January 2008, the balance in CMAs totaled 27.4 trillion won, up 18.7 trillion won (216.1%) from the end of 2006.

<Figure IV-37>



Note: 1) Based on the first three quarters of each fiscal year
Sources: Financial Supervisory Service, Korea Securities Research Institute

<Figure IV-38>



volume of brokers' loans[37] rose sharply on the back of surging stock prices during the year, lifting their share in securities companies' total assets from 5.2% the year before to 7.9% at end-2007.

Robust profitability

During April to December 2007, securities companies' net earnings jumped 92.7% (1.7 trillion won) from the corresponding period the previous year to 3.6 trillion won, their highest level since 2000. Their net income soared as the stock price inflation during this period pushed up both securities companies' brokerage fee incomes, by boosting their daily average trading volumes, and their proprietary trading incomes.

Despite competitive slashing of brokerage fees, brokerage income represented an overwhelming share in securities companies' total income in 2007, in the range of 60%, thanks to increased trading volume driven by the bullish stock market. If securities companies maintain their current brokerage fee-centered revenue models, their profitability is unlikely to improve significantly in the future. Uncertainties in the international financial markets are expected to have a dampening effect on stock prices, while the entry into effect of 「the Capital Market Consolidation Act」 will intensify competition. The share of fund sales commissions in total income rose 4.5%ps–from 12.1% at the end of 2006 to 16.6% at end-2007, bolstered by

37) The volume of brokers' loans increased sharply with the financial supervisory authority's de facto ban in February 2007 of investors' delay of settlements without receiving prior credit commitment from brokers) in favor of margin trading. It soared to 12.2 trillion won by the end of June. However, with the subsequent imposition of maximum caps on margin trading in accordance with the size of the securities companies involved, to prevent continuation of the drastic increase in lending, the volume decreased to 10.6 trillion won at end-2007.

brisk sales of stock funds. In the meantime, the share of income from proprietary trading remained in the stable range of 11-12%. The share in total income of corporate financing and other investment banking income inched up from 4.9% at end-2006 to 5.6% at end-2007, which is however still far below the corresponding average among large US investment banks.[38)]

Securities companies' net working capital ratio,[39)] an indicator of their capital adequacy, stood at 599.7% at the end of 2007, up 47.8%ps from the end of 2006 (551.9%). This is well above the Financial Supervisory Service-recommended ratio of 150%.

38) In 2006, the investment banking segment accounted for a 19.3% share of total income at Merrill Lynch, a 14.9% share at Goldman Sachs and a 17.6% share at Morgan Stanley.

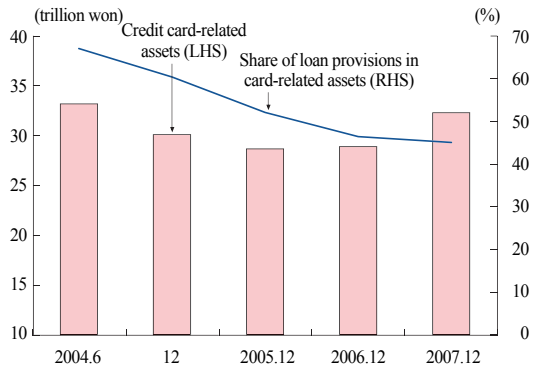
39) Net working capital (equity capital + fixed assets + subordinated loans) divided by risk-weighted (for market and credit concentration risks, etc.) assets.

Credit card companies

Credit card loans expand, asset health improves

<Figure IV-39>

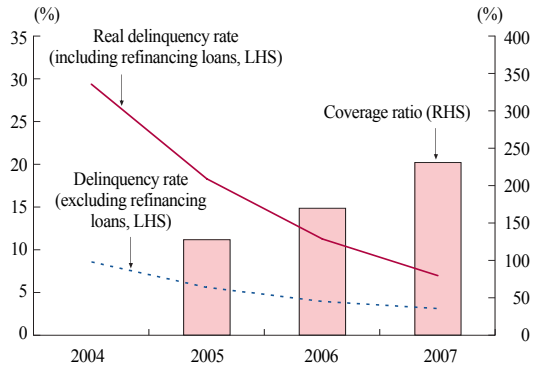
Credit card loan volume[1)2)]



Note: 1) Five specialized credit card companies; managed asset basis
2) Data for periods prior to 2005 reflect the loan balance of Choheung Bank, since then absorbed by Shinhan Card.
Source: Financial Supervisory Service

<Figure IV-40>

Credit card company asset health indicators



Source: Financial Supervisory Service

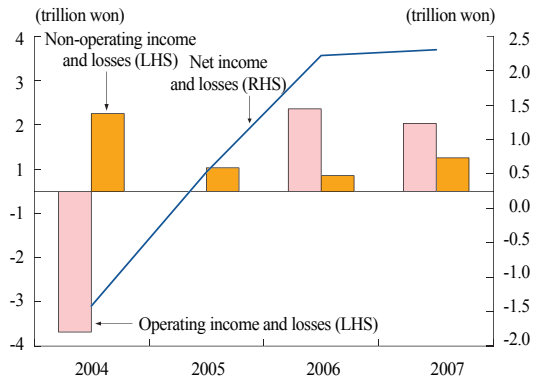
The volume of credit card loans outstanding of Korean credit card companies[40)] totaled 32.3 trillion won(managed asset basis[41)]) at end-2007. It expanded 11.7% during the year, a significantly faster rate than in the past. The improving consumer sentiment and the success of cardholder reward programs like the advance reward point program[42)] contributed to this strong performance, along with the acceptance of credit card payments by local tax authorities. As for loan provisions (cash advance service + card loans), their share in total credit card-related assets (credit purchases + loans provisions) fell 1.3% points from the previous year's level, to 45.1%.

The real rate of delinquency[43)] on loans extended by credit card companies declined to 7.0% at the end of 2007, continuing the downtrend begun in 2004. Contributory factors were the improvement in households' credit status and the sizeable reduction in refinancing loans, a loan segment with high probability of delinquency. Credit card companies' coverage ratio, an indicator of loss absorption capacity measured through the relative volume of the allowance for losses on substandard and below loans, increased noticeably – from 158.9% at the end of 2006 to 230.7% at end-2007. This was thanks to companies' enhanced asset

40) Five specialized credit card companies, namely Shinhan (which absorbed LG Card), Samsung, Hyundai, BC and Lotte
41) Total working assets with actual impact on profits and losses, corresponding to the sum of on-book B/S assets and off-book securitized assets
42) A program consisting in discounting a portion of the purchase price of a good paid for by credit card, corresponding to the value of reward points accumulated in the future
43) The rate of delinquency including late payments on refinancing loans

<Figure IV-41>

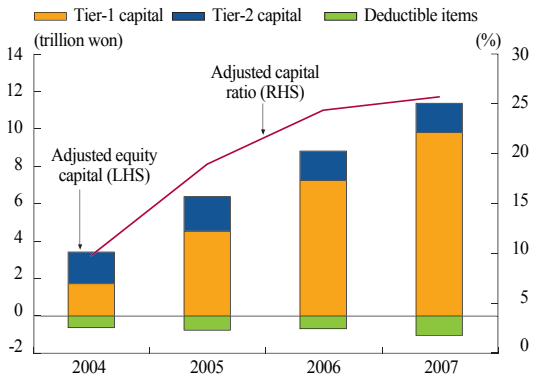
Credit card company income and losses



Source: Financial Supervisory Service

<Figure IV-42>

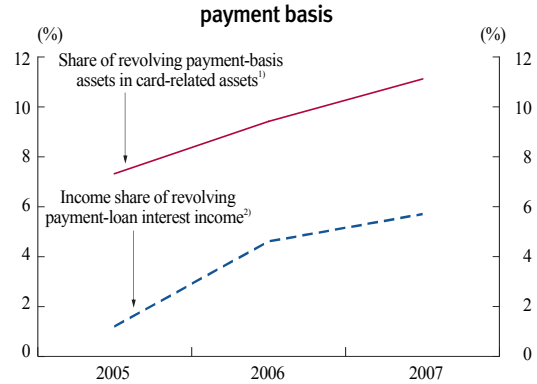
Credit card company adjusted capital ratio



Source: Financial Supervisory Service

<Figure IV-43>

Loans and credit card loans extended on revolving payment basis



Note: 1) Specialized credit card companies and credit card-issuing banks
2) Specialized credit card companies only
Source: Financial Supervisory Service

quality, coupled with stricter minimum allowance requirements imposed by the financial supervisory authority.

Enhanced capital adequacy amid continuing profitability

Credit card companies posted a huge profit for the second consecutive year in 2007, with their combined net income amounting to 2.3 trillion won. By income segment, operating income dropped marginally, as companies' stepped-up business activities boosted their selling, general and administrative expenses. Non-operating income surged sharply, on the other hand, thanks to corporate tax reductions due to carried-over deficits. The massive increase in net earnings lifted credit card companies' average adjusted capital ratio[44] from 24.4% at the end of 2006 to 25.7% by end-2007.

Revolving payment plan poses potential risk

In a bid to diversify their revenue sources, credit card companies have stepped up marketing of revolving payment plans,[45] and this new method of payment is quickly gaining popularity. At the end of 2007, credit card loans extended on a revolving payment basis stood at 6.7 trillion won, a 34.0% increase from the end of the previous year. Their share in credit card-related assets loans also climbed to 11.1%. While revolving payment plans can bring in extra income for credit card companies, in the form for example of additional

44) Adjusted capital ratio = Adjusted capital / Adjusted total assets.
45) A long-term installment payment plan (5% - 100%) whereby a cardholder is required to pay only a portion of the total balance at a pre-agreed rate, with the payment deadline on the remainder of the balance being automatically extended.

interest income, they also run the risk of leading to significantly larger unpaid loan balances, should the economy slow and weaken consumers' debt servicing capacities. Such a development would have undesirable consequences for credit card companies' asset quality, as well as their liquidity management. For the time being, however, revolving payment plans are offered mostly to customers of good credit standing, and the share of revolving payments is being maintained at a stable level. Nevertheless, a further increase in revolving payment volume would leave credit card companies more sensitive to economic conditions.

Asset management companies

Profitability improves greatly

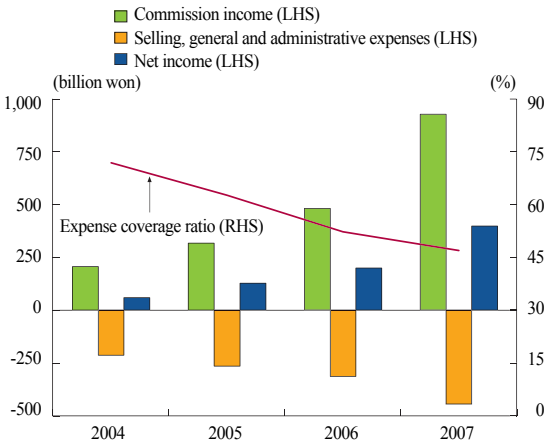
As of the end of 2007, total proprietary assets of asset management companies (51 companies) stood at 2.5 trillion won, up 22.6% (0.5 trillion won) from the end of 2006. Asset management companies' net earnings for April to December 2007 were a whopping 100.9% higher than during the corresponding period of the year previous (198.4 billion won), reaching a historic high of 398.6 billion won. Their net income more than doubled, as booming sales of stock funds (with the rate of operation fee more than six times the average for bond funds) gave a huge boost to their commission income, erasing the effect of the continuous rise in selling, general and administrative expenses. As a result, the expense coverage ratio,[46] an indicator of operating efficiency, also improved substantially – from 52.6% to 46.9%. Meanwhile, along with enhancement in profitability, the equity to risk ratio climbed to 493.8%, more than three times the recommended minimum level (of 150%). Improvement was also seen in the fixed asset to capital ratio,[47] suggesting a good level of capital adequacy and liquidity.

Managed stock fund assets surge

At the end of 2007, the balance of asset management companies' managed fund assets totaled 297.7 trillion

<Figure IV-44>

Asset management company net income



Note: Based on income and expense data for April to December of the respective years
Source: Asset Management Association of Korea

<Table IV-11>

Rate of operation fee by fund type

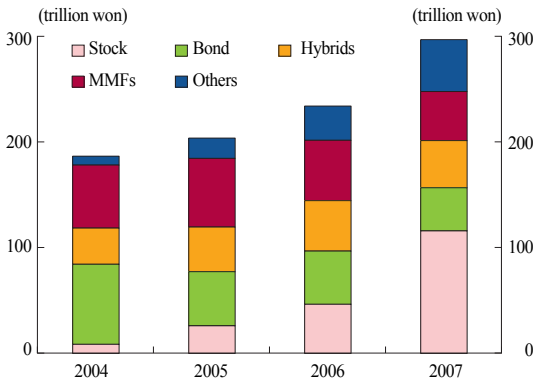
(bp)

	2005	2006	2007
Stock	58.4	65.2	74.8
Bond	13.1	11.9	11.0
MMFs	9.6	11.4	10.4

Source: Asset Management Association of Korea

<Figure IV-45>

Net inflows of money to investment funds



Source: Asset Management Association of Korea

46) The higher the expense coverage ratio [selling, general and administrative expenses / (selling, general and administrative expenses + operating income) × 100], the higher the operational efficiency.

47) The lower the fixed asset to capital ratio [fixed assets (tangible assets + lease deposits) / capital (equity capital - intangible assets) × 100], the higher the level of liquidity.

won, a 26.9% increase from the end of the previous year (234.6 trillion won). By fund type, entrustment to bond funds and MMFs declined, affected by the weakness of the bond market, by interest rate hikes, and by introduction of the next-day MMF redemption regulation.[48] In contrast, the balance of asset entrustment to stock funds increased sharply. Two factors contributed to this phenomenon. First was the appearance of a host of new domestic stock funds (most particularly regular installment funds), as the trend in personal wealth management shifted from a savings and deposit-centered to an investment and fund-centered model.[49] Second was the massive increase also seen in overseas stock funds, as a new tax law extended special treatment to the related capital gains.[50] As a result, the share of managed stock fund in overall managed fund assets jumped from 19.8% at the end of 2006 to 39.1% at end-2007, to surpass the share of bond funds (21.5% at end-2006 → 13.7% at end-2007) for the first time. Assets managed by special-type funds investing in financial derivatives, real estate and other special-category assets also grew significantly, from 32.5 trillion won at end-2006 to 49.1 trillion won by end-2007.

The recent steep growth in funds' managed assets has mostly benefited the handful of large asset management companies that claim an overwhelming

48) This regulation requires an asset management company to buy back fund shares upon investor request, by paying their ending price on the day of the request and no later than on the day immediately following. The regulation went into effect from November 21, 2005 for corporate customers, and from March 22, 2007 for individual customers.

49) By type of financial institution, the inflow of new money increased the most in 2007 among funds (by 63.1 trillion won), followed by banks (26.3 trillion won), life insurance companies (19.0 trillion won) and securities companies (14.0 trillion won).

50) The law temporarily waives taxation on capital gains from investment in overseas stock funds, from June 1, 2007 to 2009.

portion of overall cash inflows. Further, the accelerating outflows of deposit money toward these investment vehicles is increasing banks' reliance on wholesale funding, which ultimately heightens overall financial market volatility. Also worrisome is the heavy concentration in certain categories of stocks in funds' investment portfolios. This can lead to excessive price adjustments in the stock market in the case of any major external shock causing financial unrest.[51)]

51) For further information on this topic, see 'Structural changes in the fund market and potential risk factors' in <Box IV-4>.

<Box IV-4>

Structural changes in the fund market and potential risk factors

1. Current status and characteristics

Securities investment fund products are the mainstay of Korea's indirect investment market, as well as one of its principal growth drivers. Starting from 2005, in spite of a noticeable decline in bond funds, the overall fund market expanded massively, thanks to the upswing in stock funds and non-traditional funds like derivative funds. In stock funds, unlike during the so-called 'Buy-Korea' boom period(Nov. 1998-Dec. 1999) led by domestic stock funds, growth is mostly driven by overseas stock funds. The rapid growth of stock funds was accompanied by the diversification of investment destinations, a widening of the indirect investor base helped by the popularity of installment funds, and development in the size of individual funds. As a result, the funds industry made sizeable progress in terms of quality.

In 2007, stocks edged out bonds in the share of total managed fund assets, pointing to a clear shift away from the bond-centered asset management model that prevailed in the past. Another notable change is the globalized investment destinations. Stock booms in China and other emerging markets, together with overseas investment-friendly tax rules,[i] lifted the share of overseas investment funds in total funds to 25%.

Asset under management(AUM) by type of fund[3]

(trillion won, %)

	2003	2004	2005	2006	2007
Stock	9.4	8.5(4.5)	26.2	46.5	116.3(39.1)
Hybrid	39.2	34.6(18.5)	42.5	48.0	44.7(15.0)
Stock hybrid	12.1	8.6(4.6)	8.4	8.9	12.9(4.3)
Bond hybrid	27.1	25.9(13.9)	34.1	39.1	31.8(10.7)
Stock-related subtotal	48.6	43.1(23.0)	68.7	94.5	161.0(54.1)
Bond	54.4	75.9(40.6)	51.4	50.4	40.9(13.7)
MMFs	42.0	59.8(32.0)	64.8	57.2	46.7(15.7)
Others[2]	-	8.2(4.4)	19.4	32.5	49.1(16.5)
Total	145.0	187.0(100)	204.3	234.6	297.7(100)

Notes: 1) End period basis (excluding offshore funds); 2) Special asset funds, derivative funds, real estate funds, etc.
3) Figures in parenthesis are the percentage shares of the respective fund types
Source: Asset Management Association of Korea

Also, since 2005, thanks to the popularity of installment funds,[ii] funds have become a familiar investment vehicle for retail investors. Currently, individual investors make up 87% of all stock fund investments. In terms of fund size, there are at present several large stock funds exceeding 1 trillion won in size, even if these are still quite small compared to jumbo foreign funds.[iii]

However, there are also some structural vulnerabilities in the stock fund market that warrant caution. The upward trend of concentration in the fund market, the lopsided investment of assets in a small number of funds

i) Effective from June 2007 to the end of 2009, the government extended a temporary waiver on capital gains tax on investment income from Korean funds investing in overseas stocks (excludes offshore funds and funds of funds (FoF)).

ii) As of the end of 2007, the combined size of installment funds amounted to 58 trillion won, corresponding to 19.6% of all funds. Meanwhile, the number of installment fund accounts rose from 2.3 million in March 2005 to 14.8 million at the end of 2007.

iii) According to a survey by the US ICI (Investment Company Institute), released in May 2007, the average size of mutual funds at the end of 2006 was 1.192 trillion won in the US, 384 billion won in the UK, 264 billion won in Germany, and 195 billion won in Japan, greatly surpassing the corresponding figure in Korea (33 billion won at the end of 2007).

and the tendency to convergence in their asset management style are other factors that raise concern.

The phenomenon of the concentration of stock fund assets in large asset management firms has been worsening in recent years, with the Herfindahl-Hirschman Index(HHI) climbing steeply between the end of 2004 and the end of 2007, rising from 847 to 1,407. The combined market share (CR3) of the top three firms also surged from 41.3% to 51.3% over the same period.

Further, the overriding priority of high return translates into a large-cap growth stock-centered asset portfolio. The regional concentration of overseas investment funds is rapidly rising owing to the supersized investment flows to China or into China-related assets. Meanwhile, although the flow of money into installment funds remains rather steady, the funding structure is not entirely stable in that most of them are funds with flexible contribution options.

Fund market concentration

(end period basis)

	2004	2005	2006	2007
HHI	629	529	489	574
Stock	847	960	1,330	1,407
CR1(%)	11.9	10.2	9.2	16.7
Stock	18.5	25.2	32.3	33.3
CR3(%)	34.5	29.4	26.2	30.8
Stock	41.3	41.7	49.1	51.3

Source: Calculation based on Asset Management Association of Korea statistics

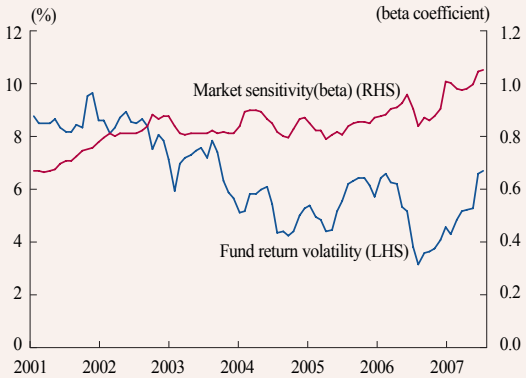
2. Potential risk factors

It seems that there are potential risk factors to financial stability. For instance, there is a possibility that the accelerated inflow of cash into stock funds accompanied by large portfolio shift between financial institutions and a lopsided concentration of money in a few large funds can destabilize financial markets. There is also a possibility of a massive sell-off in the event of a stock market downturn.

(Risk factors arising from intra-financial sector money movement)

The growth of the fund industry is likely to positively affect the capital market by increasing market liquidity and creating a diversified base of investors with different degrees of risk appetite. However, an excessively rapid reallocation of assets, in this case, from deposits to investment, can have unpredictable consequences on the flow of funds among financial sectors and fund supply within it, increasing volatility over a short term. Large outflows from banks' deposit money to stock funds, at a time when long-term home mortgage loans have sharply expanded at commercial banks, can make it particularly hard for banks to manage liquidity and it further increases their dependence on wholesale funding, through instruments like CDs and financial debentures.

Market sensitivity of stock funds



Source: Korea Fund Ratings

(Risk factors arising from the investment concentration in fund market)

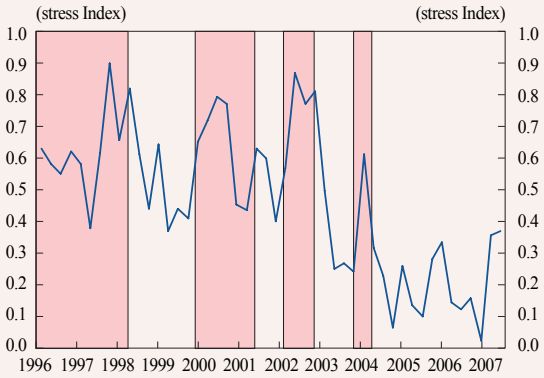
Returns on domestic stock funds can be highly volatile depending on stock market conditions, as the stock investment ratio exceeds 90% in most large stock funds. Their beta (β) coefficient[iv] with respect to the composite stock index has been steadily rising in recent months, indicating heightened price sensitivity. The high concentration in large-cap growth stocks is another factor that increases the potential volatility of their portfolio yields. On the other hand, the likelihood of investment concentration causing turmoil in the domestic market has been significantly reduced, as the boom in overseas investment funds has helped globalize investment destinations. Meanwhile, overseas stock funds, in turn, invest heavily in China and a handful of other emerging market countries, and as a result, their exposure to country risk and exchange rate risks is high. The tendency of synchronicity between global equity markets could magnify the global propagation effect of financial shocks.

(Massive fund sell-off and liquidity risk)

Given the current moderate level of stress in the stock market, which is below the level during periods of stock price decline, and the trend of net capital inflows to stock-related funds, unabated even amid the market downturn during the 2nd half of 2007, owing to the boom for the installment funds, a sudden fund run appears less likely than in the past. However, as lump-sumcontribution funds or installment funds with flexible contribution options account for the vast majority of them, the inflow of cash remains less than stable or steady. This, coupled with the relatively small share of short-term current assets in most of them, makes stock funds rather vulnerable to liquidity risks that may arise from a sudden, massive sell-off triggered by a deterioration of market conditions in Korea and abroad.

Stock market stress index[1] trends

(quarterly average basis)



Note: 1) The index, based on four indicators (including the KOSPI and change in trading volume and volatility), is assigned a standardized score between 0 and 1. The closer the value is to 1, the stronger the level of stress is
2) Shaded areas are periods of stock price decline.
Source: Bank of Korea

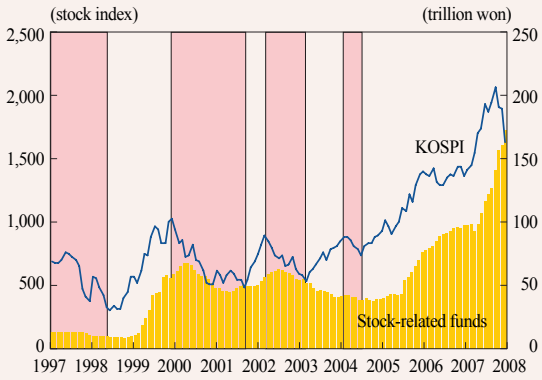
3. Implications

A vigorous indirect investment market, whilst an essential condition for the sound development of the capital market, can nevertheless have a destabilizing effect on the financial system, when its expansion is excessively rapid or is accompanied by a heavy concentration in a few high-return assets. Such an environment is likely to

iv) The beta coefficient is an indicator of the sensitivity of fund yields to changes in benchmark yields. When β, is less than 1, the fund is considered stable, the yield being less sensitive than market yields. A β coefficient greater than 1 indicates a high sensitivity of yield, suggesting, therefore, that the fund is rather risky.

trigger a boom and bust episode, shaking the entire financial system by unexpected external shocks. Hence, it would be of paramount importance for the stability of the market, to strengthen investor protection arrangements and to raise the level of transparency in fund investment, for instance, by enhancing fund rating and disclosure systems to help investors clearly understand risk factors and the process of funding and asset management. In addition, investors must be encouraged to make investment decisions in favor of the long-term and put money into funds at their own responsibility.

Stock index and stock-related funds[1]



Notes: 1) Stock-related funds = stock funds + hybrid funds
2) Shaded areas are periods of stock price decline
Source: Asset Management Association of Korea

Ⅴ. Changes in the financial infrastructure

1. Payment and settlement systems

Payment and settlement trends

Payments and settlements made via the Korean won payment systems increased in 2007, in terms of both volume and value.

Large-value interbank Korean won settlements made through BOK-Wire averaged 149.1 trillion won daily, up 15.8% over 2006. While the volume of call transaction settlements fell moderately from its 2006 level, settlement volume increased overall, mainly due to the sharp growth seen in foreign currency settlements and customer-requested interbank funds transfers.

In value terms, settlement via the retail payment systems jumped 17.7% to 39.4 trillion won, buoyed by an increase in the volume of bill issuance related to interbank call transactions and by accelerating growth in internet banking and other forms of electronic payment.

Foreign currency settlements via the CLS (Continuous Linked Settlement) system also rose over the year before-by a whopping 59.3%.

In spite of a slight drop in the volume of bond transaction settlements, the volume of securities transaction settlements grew and the value of settlements made via the securities settlement systems increased 9.7%.

<Table V- 1>

Payment system settlement volume

(daily average)

(thousand transactions, trillion won, %)

		2005	2006 (A)	2007 (B)	Change (B-A)/A
Volume	BOK-Wire	7.9	8.4	9.1	8.6
	Retail payment systems	14,089	15,150	16,273	7.4
	Bill Clearing System	3,283	3,267	3,260	-0.2
	Giro System	3,753	4,008	4,342	8.3
	Interbank Shared Network System	7,053	7,875	8,671	10.1
	Total	14,097	15,159	16,282	7.4
Value	BOK-Wire	120.7	128.7	149.1	15.8
	Retail payment systems	29.7	33.5	39.4	17.7
	Bill Clearing System	14.4	15.2	17.8	17.3
	Giro System	0.5	0.5	0.6	10.7
	Interbank Shared Network System	14.8	17.8	21.1	18.3
	Total	150.4	162.2	188.5	16.2

Source: Bank of Korea

<Table V- 2>

CLS settlement volume

(daily average)

(thousand transactions, billion dollars, %)

	2005	2006 (A)	2007 (B)	Change (B-A)/A
Volume	289.8 (1.2)	930.1 (3.8)	1,039.1 (4.2)	11.7
Value	952.4 (3.8)	2,502.8 (10.1)	3,987.2 (16.7)	59.3

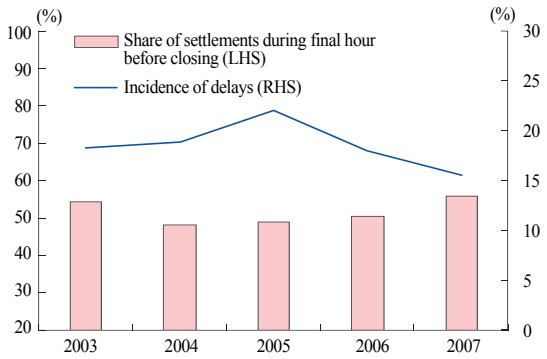
Source: Bank of Korea

Settlement risk trends

<Figure V- 1>

BOK-Wire settlement volume during final hour before closing[1], and incidence of delays

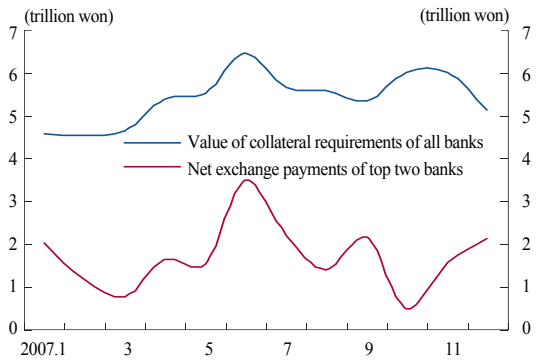
(value basis)



Note: 1) 4:00~5:00PM
Source: Bank of Korea

<Figure V- 2>

Settlement obligations of top two banks[1], and total settlement collateral of all banks



Note: 1) The two banks with the highest values of net exchange payments on the day with the highest overall net exchange payment amount during the reference month for morning net settlement
Source: Bank of Korea

Despite the significant increase in transaction volume, the payment and settlement systems operated stably in 2007, and settlement risks were also managed appropriately.

There were no incidences of settlement delays due to BOK-Wire system error or failure. Meanwhile, queuing incidents due to fund shortages fell from 17.8% of total transactions in 2006 to 15.0%. The problem of the closing-time bottleneck worsened, however, as the percentage of settlements made after 4:00PM rose from 50.4% in 2006 to 55.8%. This phenomenon owed, on the one hand, to the expanding volume of foreign currency settlements by domestic branches of foreign banks, where settlements are typically conducted at around closing time, and on the other to the increased inflows of funds into asset management firms, another category of institutions known for heavy concentrations of late afternoon settlement.

As of end-2007, institutions participating in the retail payment systems operated by Korea Financial Telecommunications & Clearings Institute (KFTC) had deposited 5.8 trillion won in securities with the Bank of Korea, as collateral to guarantee net settlement performance. This amount is more than enough to meet all settlement needs (4.3 trillion won at the annual peak), even if the two banks with the largest settlement obligations fail to perform their obligations simultaneously. It thus fully satisfies the international best practice suggested by the BIS (Bank for International Settlements).

The volume of settlement via the DVP (Delivery

<Table V- 3>

Payment and settlement systems appraised

Category			System-operatingorganization
Systemically important payment and settlement systems	BOK-Wire		Bank of Korea
	Bill Clearing System		KFTC
	Interbank Shared Network System	Interbank Funds Transfer System	
		Electronic Banking	
	OTC Bond Market Settlement System		Korea Securities Depository
	Securities Market Settlement System		Korea Exchange
	KOSDAQ Market Settlement System		
	Futures Market Settlement System		
General payment and settlement systems	Giro System		KFTC
	Interbank Shared Network System	CD	
		CMS	
		B2C Electronic Commerce Payment System	
		B2B Electronic Commerce Payment System	
		K-CASH System	
		Electronic Funds Transfer at the Point of Sale System	
		Local Bank Shared System	
	BC Card Settlement System		BC Card
	Foreign Currency Funds Transfer System		Korea Exchange Bank, Kookmin Bank
	Community financial institution federation payment and ettlement systems		National Agricultural Cooperative Federation, National Federation of Fisheries Cooperatives, Korea Federation of Savings Banks, Korean Federation of Community Credit Cooperatives, National Credit Union Federation of Korea

Source: Bank of Korea

versus Payment) system, operated jointly by the Bank of Korea and the Korea Securities Depository, grew steadily in 2007 as well, resulting in a significant reduction in risk arising from delivery of securities before payment. The share in total foreign currency transactions of settlements made through the CLS system also increased, cutting the risks associated with settlement time mismatches between currencies bought and sold.

Payment and settlement system appraisals

In 2007, the Bank of Korea conducted appraisals of six systemically important payment and settlement systems,[1] including three retail payment systems (the Bill Clearing System, Interbank Funds Transfer System and Interbank Electronic Banking Network) operated by KFTC, and three securities settlement systems (the Securities Market Settlement System, KOSDAQ Market Settlement System and Futures Market Settlement System) operated by the Korea Exchange. This was the first-ever appraisal of the Futures Market Settlement System since its designation as a systemically important system in Aug. 2006. The Foreign Currency Funds Transfer System, a general payment and settlement system[2] operated by the Korea Exchange Bank, was also appraised for the first time during the year.

1) Systemically important systems are payment and settlement systems whose malfunctions could have repercussions on other financial systems in and outside Korea, or might result in failures or collapses thereof. These systems are appraised by the Bank of Korea, with regard to their safety and efficiency, every other year.
2) General payment and settlement systems are all systems not designated as systemically important ones. These systems are only appraised as deemed necessary by the governor of the Bank of Korea, for example in the event of important changes occurring that affect their safety and efficiency.

The systems appraised all proved to satisfy international standards for safety and efficiency. To further enhance payment and settlement system security and efficiency, however, the Bank of Korea issued recommendations for corrective actions in certain areas where it deemed improvements necessary. The results of appraisal of the Korea Exchange's securities settlement systems were also forwarded to the Ministry of Finance and Economy, the Financial Supervisory Commission, the Financial Supervisory Service and other relevant government authorities.

Improvement of payment and settlement systems

Safety of payment and settlement systems strengthened

In the context of legislation of the 「Capital Market and Financial Investment Services Act」, the Bank of Korea, in consultation with the government, designed measures in 2007 to prevent any negative consequences on payment and settlement system safety that the new law's authorization of payment and settlement transaction handling by financial investment companies may have. One highlight of these measures is having a designated settlement bank conduct net settlements on behalf of financial investment companies participating directly in the retail payment systems. The new law also includes clauses conferring upon the Bank of Korea the right, as necessary for carrying out its payment and settlement surveillance duties, to demand information from and perform joint examinations on financial investment companies. In order to manage settlement risk, finally, financial investment companies will be given net debt limits and required to provide collateral to their designated

<Table V- 4>

Check truncation system project - phase II

Category	Type of payment instruction	Time of implementation
Bills, checks	Bills, checks	Apr. 2008, Seoul (pilot implementation)
Giro slips	KFTC and other remittance slips	Dec. 2004
	National and local taxes	Implementation by tax administrators

Source: Bank of Korea

settlement banks.

Meanwhile, concerning the authorization for cashier's check issuance granted to community financial institutions such as the Korean Federation of Community Credit Cooperatives, mutual savings banks and credit unions, a series of settlement risk management-related measures have been prepared to secure payment and settlement system safety, including one requiring the institutions concerned to participate in the bill clearing system through their designated settlement banks. The second phase of the check truncation project also finally kicked off in 2007, as amendments of the「Bills Act」and the「Checks Act」to allow electronic exchanges of data for bill and check clearing and settlement were completed, providing the project with the legal approval it needed.

Further, to relieve BOK-Wire settlement overload during the afternoon hours, the deadlines for net settlement of bills of exchange and for repayment of one-day and longer call money at the Seoul Clearing House were moved from 2:30PM to 11:30AM, effective January 2008. The one-hour limit imposed on transaction queuing was lifted as well, to encourage participant institutions to place their funds transfer instructions earlier in the day.

Efficiency of payment and settlement systems enhanced

The project to implement a next-generation BOK-Wire system progressed smoothly in 2007, according to plan. Scheduled for operation from the first half of

<Table V- 5>

Name of new BOK-Wire system

Official Name	Informal Name
New Bank of Korea Financial Wire Network	BOK-Wire+

Source: Bank of Korea

<Table V- 6>

After closing BOK-Wire fee schedule

(Korean won per transaction)

Category		Before (A)	After (B)	Change (B-A)
Transactions via BOK-Wire	Domestic currency fund transfers (except DVP)	600	4,000[1)]	3,400
	Foreign currency fund transfers (except CLS)			
	Government and public bond transactions			
	Delivery versus payment	450	4,000[1)]	3,550
	Continuous linked settlement	4,300	4,300	0
	Cancellations of request	800	4,000	3,200
Manual transactions	Foreign currency fund transfers (except CLS)	2,000	4,000	2,000
	Continuous linked settlement	5,000	4,300	△700
	Other transactions	5,000	4,000	△1,000

Note: 1) Before closing time fees applied when operation hours prolonged due to a Bank of Korea or Korea Securities Depository system failure

Source: Bank of Korea

2009, the new system is designed to reduce the settlement fund requirements for participant institutions and relieve the settlement bottleneck now occurring at around closing time. The detailed structure of the planned hybrid settlement system was determined, and concrete methods were selected for interconnection between the Bank of Korea and BOK-Wire participant institutions. The official name "New Bank of Korea Financial Wire Network (BOK-Wire+)" was chosen for the system.

A notable change toward greater efficiency during this period was the making of pre-arranged fund transfers (used by BOK-Wire participants for procuring additional funds needed for afternoon net settlement) available for morning net settlement as well, effective from April 2007. Further, as BOK-Wire closing time was being extended frequently and the fee schedule varied in accordance with the processing method, starting from December 2007 it was required that each extension request be accompanied by a clear statement of the reason for extension and that it also follow a stricter procedure. To introduce consistency in the processing of fees on after-hour funds transfers, meanwhile, the fee schedule was overhauled so that a uniform rate is charged on all after-hour transfers, irrespective of the processing method.

In an effort to gauge the level of satisfaction with Korean payment and settlement systems and identify areas that may need improvement, between September and October 2007 the Bank of Korea surveyed individuals, corporations and institutions participating in BOK-Wire. The results revealed satisfaction with the payment and settlement systems to be quite high. An overwhelming majority of respondents indicated that they were satisfied, with less than five percent

expressing dissatisfaction. The Bank of Korea plans to continue to monitor user opinions on a regular basis and actively seek to remedy complaints and reflect feedback received through this survey.

2. Domestic financial systems

Monetary policy overhaul

The Bank of Korea finalized its 'Reform of the Bank of Korea's Monetary Policy Framework' project on November 30, 2007. The relevant amended and newly-enacted regulations came into effect from March 2008.

In the aftermath of the 1997 foreign currency crisis, the Bank of Korea shifted its operational framework from a monetary aggregate-oriented to an interest rate-oriented framework. Since then, a monthly call rate target had been set by the Monetary Policy Committee. Call rate targeting is generally considered to have made important contributions to the stability of Korea's macro-economy and financial markets. At the same time, however, the system had also drawn criticism – for restricting the short-term financial markets by tying the call rate to the target level, irrespective of fund supply conditions, and for slowing down the market-wide propagation of monetary policy. To address these issues and bring call rates more into line with market realities, the Bank of Korea has now changed its policy rate and overhauled the related systems such as its lending system and reserve requirement scheme.

First, the policy rate set monthly by the Monetary Policy Committee has been changed from the overnight call rate target to 'the Bank of Korea Base Rate', which will serve as the reference interest rate in transactions between the BOK and financial institutions such as repurchase agreements (RPs), use of the Bank's lending and deposit facilities, etc.

<Table V- 7>

Highlights of monetary policy reform

Category	Description
1. Policy rate	
Change of policy rate	- Overnight call rate target → Bank of Korea Base Rate
Relationship between call rate and Base rate	- The overnight call rate, as the market interest rate trigger in the monetary policy propagation mechanism, will be kept as close as possible to the Base Rate.
2. Reserve requirements	
Fully lagged reserve maintenance period	- 7-day lag for each half-month maintenance period → More than one month lag for each half-month maintenance period
Period during which vault cash regarded as reserves	- reserve maintenance period → reserve calculation period
Reserve maintenance period	- Date basis → Day-of-the week basis
3. Open market operations	
Regular scheduling of open market operations	- Sales of 7-day RPs held every Thursday, for short-term liquidity management. - When the day of the MPC policy rate decision is not a Thursday, or Thursday is a holiday, the days on which RP transactions are undertaken and their maturities are adjusted accordingly. - Exceptionally, during large amount call rate fluctuations, one-day or other short-term RP transactions may be conducted.
Change of RP operation method	- Base Rate applied as fixed bid rate for 7-day reverse RPs and as minimum bid rate for 7-day RPs. - One-day and all other short-term RPs sold through fixed rate auction using the Base Rate.
4. Loans and Deposits	
Introduction of Standing Facilities	- Launch of liquidity adjustment loans and deposits which reserve depository institutions can access without restriction on either frequency or scale of use. - Loan and deposit rates of ± 100bp from the Base Rate - Premium of ± 50bp applied on final day of reserve maintenance period, to prevent abrupt call rate movements. - In the event of financial market instability (caused, for instance, by system failure), the interest rates, maturities and collateral for adjustment loans and deposits are adjusted accordingly.
Current lending facilities	- 'Aggregate Credit Ceiling Loans' and 'Intraday Overdrafts' remain in place. - 'Loans to Meet Temporary Shortages of Funds' and the old 'Liquidity Adjustment Loans' have been abolished.

Second, with regard to banks' reserve requirements, the lag between the required reserve calculation and subsequent maintenance periods, has been changed, from a seven-day lag for each half-month maintenance period to a lag of more than one month. Further, the period during which vault cash is regarded as reserves has also been changed – from the reserve maintenance period to the reserve calculation period. The reserve maintenance period will in addition now be determined on a day-of-the week basis, rather than a date basis.

Third, open market operations will from now on be performed in accordance with a set schedule. Open market operations for adjustment of short-term liquidity will be conducted once a week, on every Thursday, with sales of seven-day RP their principal means. Further, to link the policy base rate to the rate applied to RP transactions, the Base Rate is now used as the fixed bid rate for reverse RPs and as the minimum bid rate for RPs.

Finally, the Bank has introduced new standing facilities, consisting of liquidity adjustment loans and deposits. Through use of these facilities, depository institutions can access liquidity adjustment loans and deposits without restrictions on their amount or frequency. Similar programs previously in place, such as 'Loans to Meet Temporary Shortages of Funds' and the former 'Liquidity Adjustment Loans', have been abolished.

<Table V- 8>

Highlights of financial supervisory organization reform

	Before	After
Financial Supervisory System	• 3-tier Structure: (Ministry of Finance and Economy) - Financial policies and programs - Financial legislation - Supervision of foreign exchange transactions (Financial Supervisory Commission) - Enactment and amendment of regulations on financial institution supervision - Licensing of financial institutions and other authorization processes - Audit and inspection of financial institutions - Management and supervision of securities and derivatives markets - Supervision of the Financial Supervisory Service (Financial Supervisory Service) - Financial supervision activities	• 2-tier Structure (Financial Services Commission) - Financial policies and programs - Supervision, audit and inspection of financial institutions - Licensing of financial institutions and other authorization processes - Management, supervision and surveillance of capital markets - Financial hub development - Enactment and amendment of financial laws and regulations - International cooperation in financial market supervision - Supervision and monitoring of banks handling foreign exchange transactions - Supervision of the Financial Supervisory Servic (Financial Supervisory Service) - Financial supervision activities
Composition of commission	(Financial Supervisory Commission) - Permanent members (3): Chair, Deputy-chair and one person nominated by Chair - Non-elected members (3): Deputy Minister of Finance and Economy, Senior Deputy Governor of Bank of Korea, Chairman & President of Korea Deposit Insurance Corporation - Non-permanent private-sector members (3): Nominated separately by Minister of Finance and Economy, Minister of Justice, and Chairman of Korea Chamber of Commerce and Industry	(Financial Services Commission) - Permanent members (4): Chair, Deputy-chair and two persons nominated by Chair - Non-elected members (4): Deputy Minister of Strategy and Finance, Senior Deputy Governor of Bank of Korea, Chairman & President of Korea Deposit Insurance Corporation, Governor of Financial Supervisory Service - Non-permanent private-sector member (1): Nominated by Chairman of Korea Chamber of Commerce and Industry
Executive Officials of Financial Supervisory Service	- Governor: Concurrently Chair of Financial Supervisory Commission - Deputy Governor and Assistant Governor: Appointed by Financial Supervisory Commission, upon recommendation of Governor - Auditor: Appointed by President of Republic of Korea, upon recommendation of Financial Supervisory Commission	- Governor and Auditor: Appointed by President of Republic of Korea, upon recommendation of Chairman of FSC following pre-approval by Commission - Deputy Governor: Appointed by FSC, upon recommendation of Governor - Assistant Governor: Appointed by Governor

Restructuring of financial supervisory organizations

On February 26, 2008, the Korean legislature passed amendments to the Act on the Establishment of Financial Supervisory Organizations. This move was intended as a means of enabling proactive financial industry responses to the changing environment and promoting the financial industry's modernization (proclaimed and enacted February 29, 2008).

Under the amended law, the previous three-tier supervisory system, involving the Ministry of Finance and Economy (renamed the "Ministry of Strategy and Finance" following the recent government restructuring), the Financial Supervisory Commission, and the Financial Supervisory Service, has been downsized to a two-tier system revolving around the Financial Services Commission and the Financial Supervisory Service.

The newly-established Financial Services Commission, a collegial body reporting to the Office of the Prime Minister, has been put in charge of financial policy-related duties previously performed by the Ministry of Finance and Economy, and supervision and surveillance activities carried out in the past by the Financial Supervisory Commission. While comprising a nine-member panel like its predecessor the Financial Supervisory Commission, the Financial Services Commission has more permanent members (the chair and deputy chair of the Commission and two other persons nominated by the chair) and more non-elected members (the Deputy Minister of Strategy and Finance, Senior Deputy Governor of the Bank of Korea, Governor of the Financial Supervisory Service, and Chairman & President of the Korea Deposit Insurance Corporation). Non-permanent private-sector

representation has been reduced to one member (nominated by the Chairman of the Korea Chamber of Commerce and Industry).

As for the Financial Supervisory Service, it will continue to carry out supervisory duties as a private public-interest organization. To guarantee the organization's independence, the position of Governor, assumed in the past by the chair of the Financial Supervisory Commission, will be filled from now on by a person approved by the Financial Services Commission, nominated by its chair and appointed by the President of the Republic of Korea.

Rules on securities transactions by foreign investors eased

To enhance the securities investment environment for foreign investors, amendments to the Regulation on Supervision of Securities Business were officially approved by the Financial Supervisory Commission on December 21, 2007 (before then taking effect on January 1, 2008).

The newly amended rules include easing of restrictions on off-exchange securities trading and exempting foreign securities depositories from Korea Securities Depository custodian rule, so that foreign securities depositories are no longer required to place the securities of overseas-listed Korean companies in KSD custody. Concerning listed domestic companies having caps on foreign share acquisition, the amended rule provides that, for block on-exchange trades between foreign investors, determination of whether foreign share acquisition has reached the cap will be made at the time of order execution, rather than at the time of the bid.

<Table V- 9>

Highlights of credit card company loan-loss provisioning

(1) New provisioning rates for normal and precautionary assets

Category	Before	After
Normal	1%	1.5%
Precautionary	12%	15%

(2) Change of provisioning for total undrawn lines of credit

	Provision-required credit	Provision ratio
Before	(cash advance limits of cardholders active within most recent six months x 75%) - (Unused cash advance loan balances)	0.5%
After	Undrawn lines of credit given to credit card customers x credit conversion ratio[1)]	Provision ratios based upon debt quality (1.5%~100%)

Note: 1) Ratios differentiated in accordance with Regulation on Supervision of Banking Business (20% or 50%)

Strengthening of supervision for credit card company soundness

On February 1, 2008, the Financial Supervisory Commission announced that the Regulation on Supervision of Credit-specialized Financial Business has been revised, to introduce stricter financial soundness standards for credit card companies (effective February 11, 2008).

The provisioning rates applicable to credit card companies have been adjusted upward for assets classified both normal and precautionary – from their former 1% and 12% to 1.5% and 15%, respectively.

Provisioning against undrawn cash advances has been extended to cover total undrawn lines of credit, and the undrawn line of credit amount considered in the loan-loss provisioning calculation now includes the unused purchased limit amount as well, and not just the cash advance limits. The former 0.5% provisioning rate for undrawn credit lines has also been changed, and ranges now from 1.5% to 100% depending upon the asset quality (five levels, based upon borrower credit ratings, repayment abilities, etc.). Credit card companies will be given extensions until the end of 2008 for complying with the new provisions on undrawn lines of credit.

Introduction of direct FSS examination of private money lenders

In an effort to strengthen consumer protection, the government amended the Private Money Lending Business Registration and Borrower Protection Act and the Enforcement Decree thereto, to confer upon the Governor of the Financial Supervisory Service the right

to perform direct examination of private money lenders (with effect from March 22, 2008).

The FSS could previously conduct examination of a lender at the request of the appropriate authority of the city or province in which that lender was registered. Due to insufficient knowledge as well as lack of manpower, however, municipalities and provinces had seldom if ever audited or inspected private money lenders within their jurisdictions, or requested audits of them by the FSS. The amendments give the FSS the right now to conduct direct examinations of private money lenders above a certain size or that are otherwise difficult for a city or province to audit.

<Appendix 1>

Overview of the Korean financial stability map

1. Background

Starting since the April 2007 issue, the IMF's Global Financial Stability Report has included a global financial stability map (GFSM), a new tool for assessing the global financial system.[1] The GFSM presents a succinct visual representation assessing how changes in underlying conditions and risk factors bear on global financial stability in the period ahead.

The Bank of Korea's assessment of Korean financial system stability, provided in its biannual Financial Stability Report, has thus far consisted mostly of verbal description, and this has been one factor lessening the degree of completeness of the description. To make the financial stability information presented easier for the general public to understand, and to take analytical procedures to the next level of precision, the Bank of Korea has decided to follow the IMF's lead and include a financial stability map in its Financial Stability Report, starting from this issue (April 2008).

2. Method of constructing the map

The first step in drawing up a financial stability map was selecting sectors liable to affect Korean financial system stability. By closely taking into account the assessment system used in the Financial Stability Report, two sectors making up the financial system itself were selected, along with four sectors surrounding it, which constitute the environment for financial stability. The financial system consists of the financial markets and the banking sector. The environment for financial stability, meanwhile, comprises the global economy, the domestic economy, the debt servicing capacity of the household sector, and the debt servicing capacity of the business sector.

To assess each of these six sectors, three to four detailed items relevant to each of them were determined. For assessment of these detailed items, moreover, one to three analytical indicators were adopted for each. The analytical indicators chosen were those commonly used for assessment of financial system stability that is deemed most representative and objective.

To assess the degree of stability in the six sectors indicated, available time series data were collected for each indicator. All time series data were a priori quarterly data, but in some exceptional cases half-yearly or annual data were also used. For daily statistics such as stock price or exchange rate data, whose cycles are shorter than quarterly, quarterly average data were used. The range of time series data extends back to the year 1995 for all indicators, so as to permit comparison with the situation during the currency crisis. With regard to certain indicators for which time series data are not available back to 1995, analysis was

1) For more information on the GFSM, see *Global Financial Stability Report, April & October 2007, the IMF.*

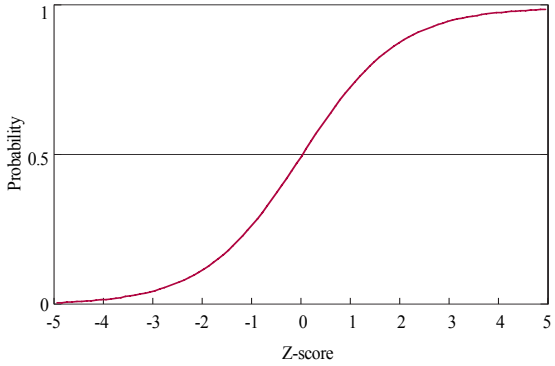
conducted from the earliest available year.

To enable easier comparison, the indicators were then standardized using the formula ($z_{ij,t}=\frac{y_{ij,t}-\overline{y_{ij}}}{\sigma_{ij}}$), based upon the time of assessment (t) and using the average ($\overline{y_{ij}}$) and standard deviation (σ_{ij}) of the time series data. For indicators whose benchmark ratios are known (e.g. BIS capital ratios, current ratios, etc.), benchmark ratios were used instead of the averages.

Comparison is possible using the standardized indicators, as the data is converted into a normal distribution with the average of 0 and standard deviation of 1. Meanwhile, to remedy the difficulty of determining the degree of stability, the standardized (z_{ij}) data were converted into scores between 0 and 100, using a logistic function ($r_{ij,t}=\frac{1}{1+\exp(-z_{ij,t})}\times 100$).[2] Next, by averaging the scores of each set of the indicators, scores were calculated for the detailed items of which they are the measure. These item scores were again averaged to calculate each sector score. The sector scores were then converted into deciles, which were finalized through review by an internal panel of financial stability experts who combined their discretionary judgment with consideration of cross-section data and market data. To complete the map, finally, the deciles were placed in appropriate locations inside a hexagonal chart.

2) The logistic function is a function whereby, when the dependent variable (Y) can have only one of the two values, 0 and 1; the greater the value of the independent variable (X), the closer the expected value of Y converges on 1. The logistic function can be used, for example, in determining the relationship between a person's monthly income and his or her car ownership status (owns a car = 1, does not own a car = 0; the probability of a person earning x in monthly income owning a car is Px).

Cumulative probability distribution of logistic function



Sectors, detailed items and analytical indicators

Sector	Detailed items	Analytical indicators
Stability of financial markets	Bond market	Government bond yield volatility
		Corporate bond credit spreads
	Stock market	Stock price volatility
		Trading value/market capitalization
	Foreign exchange market	Exchange rate volatility
		Short-term foreign debt/foreign reserves
		Premium on Foreign Exchange Stabilization Fund bonds
Soundness of banks	Credit risk	Rate of delinquency
		Ratio of substandard and below loans
	Profitability	NIM, ROA
	Capital adequacy	BIS capital ratio
	Stability of funding	Funding gap/total assets
Global economy	Economic growth	Economic growth rate
	Price stability	CPI inflation rate
	Credit risk	US corporate bond credit spreads
		TED spread
Domestic economy	Economic growth	Economic growth rate
	Price stability	CPI inflation rate
	Real estate prices	Apartment sales price index
Debt servicing capacity of the household sector	Liquidity	Financial liabilities-to-financial assets ratio
	Principal repayment capacity	Debt-to-income ratio
	Interest payment burden	Interest payments-to-disposable income ratio
Debt servicing capacity of the business sector	Profitability	Operating income-to-sales ratio
	Capital adequacy	Stockholders' equity-to-total assets ratio
	Liquidity	Current ratio
		Share of companies with net interest coverage ratios below 100

3. Interpretation of the map

The farther away from the center of the map a sector's level of risk is, in other words, the higher its decile value is, the more unstable the sector is. For comparison, the level of stability at the immediately preceding assessment point is displayed alongside that at the current evaluation point.

In some cases, incremental changes in scores of detailed items are mutually offset, so that the overall score for the sector remains unchanged. In such cases, the level of risk in the sector concerned could be interpreted as unchanged and so, to compensate for this shortcoming, a table allowing more precise understanding of the stability status of each sector, and describing changes affecting the detailed items ('Changes in risks and conditions since October 2007 Financial Stability Report'), has also been provided.

4. Limitation, and directions for improvement

The significance of the financial stability map presented herein resides in the fact that it lays the groundwork for concise visual representation of Korean financial system stability, providing a quick snapshot of relevant factors and trends. However, this map is also somewhat limited as a comprehensive tool for measuring overall financial system stability, as it is based solely on indicators used in the Bank of Korea's Financial Stability Report. This is unlike the case the IMF's GFSM, which tracks a much broader variety of indicators. The evaluation accuracy is also dubious, given the use of simple averages for the calculation of the item and sector scores. Simple averaging assigns the same weights to all indicators, irrespective of their differences in relative importance.

Just as efforts to fine-tune the GFSM are ongoing at the IMF, continuous improvements in the Korean financial stability map will be made in the future. To enhance map completeness and accuracy, analytical methods employed by the IMF and other international organizations, as well as by other central banks, will be carefully considered for inclusion in the methodology, and related new developments will be closely monitored.

Changes in risk and conditions since October 2007 Financial Stability Report

Sector and item	Change		Sector and item	Change	
	Current status (deciles)	Change from previous period		Current status (deciles)	Change from previous period
Ⅰ. Financial markets	6	+1	Ⅳ. Domestic economy	6	+1
▶ Bond market	5	+1	▶ Economic growth	6	+1
▶ Stock market	7	+2	▶ Price stability	6	+1
▶ Foreign exchange market	6	+1	▶ Stability of the real estate market	5	0
Ⅱ. Soundness of banks	4	0	Ⅴ. Debt servicing capacity of the household sector	6	+1
▶ Credit risk	3	0	▶ Liquidity	6	0
▶ Profitability	5	0	▶ Principal repayment capacity	7	+1
▶ Capital adequacy	1	0	▶ Interest payment burden	6	+1
▶ Funding stability	9	+1			
Ⅲ. Global economy	8	+2	Ⅵ. Debt servicing capacity of the business sector	5	0
▶ Economic growth	6	+2	▶ Profitability	6	0
▶ Price stability	6	+2	▶ Capital adequacy	4	-1
▶ Credit risk	9	+3	▶ Liquidity	2	0
			▶ Net interest coverage ratio	8	0

<Appendix 2>

Development of a financial system stress test model (BOKST-07) and test results

1. Relevance of stress testing

The term 'financial system stress test' refers to any type of analytical procedure used in order to measure potential vulnerabilities within a financial system to exceptional but plausible events.

Stress tests were first introduced by large investment banks during the 1990s, to measure and manage the risk of interruption of operations that might arise due to extreme deterioration of economic conditions. 'Financial system stress testing' is a concept that consists of extending test procedures originally intended for individual financial institutions for application to the financial system as a whole.

Stress testing was used as a core quantitative evaluation tool in the FSAP (Financial Sector Assessment Programme), a joint effort by the IMF and the World Bank to assess financial system stabilities in the aftermath of the Asian financial crisis. Since then, it has become popular among many central banks as a diagnostic tool for assessing a national financial system's structural vulnerabilities as well as its capacity to absorb external shocks and return to a normal state of operations.

2. Stress testing procedures

Testing approaches

Two different financial system stress testing approaches may be distinguished, depending upon the agent conducting the test: the bottom-up approach and the top-down approach. In the bottom-up approach, testing is conducted by individual financial institutions in line with a scenario provided by the central bank, which then gathers the results to formulate a global assessment. In the top-down approach, a central bank develops a stress testing model and directly assesses the aggregate impacts of potential shocks on the overall financial system, in accordance with a number of likely scenarios.

While the bottom-up approach makes possible a detailed assessment, reflecting the characteristics of individual financial institutions' portfolios, the diversity of stress testing models used by the testing institutions makes cross-comparison of their results difficult. Another disadvantage is maintenance of consistency, which is more difficult using this approach. Under the top-down approach, on the other hand, results are more consistent, as the testing model and standards are identical for all institutions evaluated. However, this approach comes with the offsetting disadvantage of difficulty in reflecting the

particularities of individual financial institution portfolios.

In recent years, a hybrid approach combining the bottom-up and top-down approaches is increasingly used.

Analytical techniques

Popular stress testing techniques include scenario analysis and sensitivity analysis, while other techniques like the maximum loss approach and extreme value theory are also at times employed. Scenario analysis is a process of analyzing possible future changes in the value of a portfolio resulting from simultaneous changes in risk factors, based upon alternative scenarios. These scenarios may be either historical or hypothetical.

Sensitivity analysis is a procedure for determining how a certain risk factor affects the value of a portfolio at different levels of risk. Supposing the risk factor in question is the exchange rate, the value of the portfolio is calculated at varying levels of exchange rate volatility, for instance from ±2% to ±4% and ±6%, etc.

With the maximum loss approach, the combination of risk factors likely to result in the biggest possible losses is identified, as well as the size of losses liable to occur under such a set of circumstances. The extreme value theory is a technique for analyzing possible changes in the value of a portfolio under a situation of stress, based upon the movement of the tail of a probability distribution.

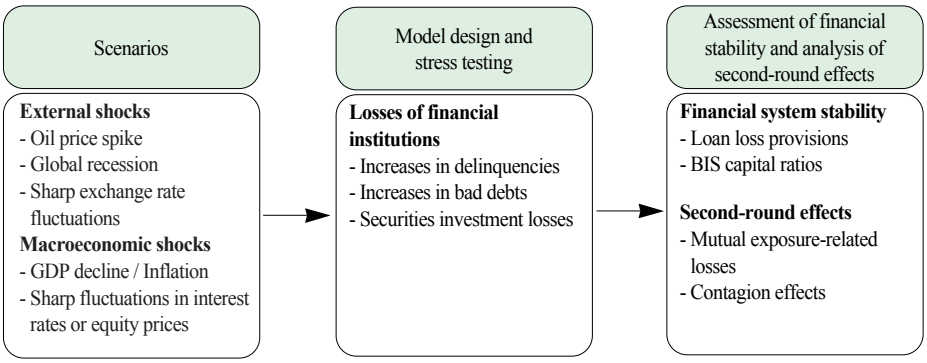
Testing procedures

The procedures involved in financial system testing consist of three steps: generation of scenarios, the stress test and assessment of system stability.

To generate scenarios, relevant historical examples are consulted to determine the types and sizes of initial shocks likely to result in extreme losses for a financial system. It is important that the initial shock envisioned be sizeable enough, even if not excessively large, so that the resulting stress scenario is probable and internally consistent.

Next, a quantitative model for measuring the impacts of external shocks on the financial system is developed. Using this model, the impacts on the

<Figure 1> **Financial system stress testing procedure**



financial statuses of individual institutions are then estimated.

The volume of potential losses obtained from this measurement is then compared with the size of banking sector capitalization to estimate the vulnerability and resilience of the financial system. Additional analysis may be conducted, as necessary, to estimate the second-round effects of the vulnerability of an individual institution to a shock on the overall financial system and the macro-economy.

3. Financial system stress test model of the Bank of Korea (BOKST-07)

The Bank of Korea's financial system stress test model (BOKST-07) assesses the stability of the financial system by comparing changes in the levels of risk faced by financial institutions following a shock (estimated through quantitative measurement models for credit, market and interest rate risks) with changes in their BASEL Ⅱ BIS capital ratios.[1)]

Credit risk stress testing model

The credit risk stress testing model consists of (1) a probability of default (PD) estimation model, for determining the relationship between macroeconomic variables and the PD, and (2) a credit risk estimation model, employing the FIRB (Foundation Internal Ratings Based) approach of BASEL Ⅱ and using the estimated PDs as input variables.

(PD estimation models)

PD estimation models were separately developed for the corporate, SME corporation, and retail segments, given the fact that the PD related to an external shock varies significantly depending upon the nature and type of exposure.

The PD estimation model defines the relationship between the macroeconomic variables and the probability of default (a determinant of the value of credit assets). It was estimated using default data from the period Q4 2000 to Q4 2006, classified by bank and by exposure, to set up an unbalanced panel model.[2)]

(Credit risk estimation model)

Changes in credit risk occurring in situations of stress were measured employing the risk weight functions[3)] used under the FIRB approach in BASEL Ⅱ. The input variables used for measurement were the default probabilities calculated through the above-described PD estimation model.

Market risk stress testing model

Using the market risk stress testing model, changes in mark-to-market asset value in response

1) The stability of the BOKST-07 model was tested using the results of analyses of portfolios at the end of 2006, conducted through a combination of the bottom-up and top-down approaches.

2) The panel model was estimated as a fixed-effects model, and the stationarity of the model was tested using econometric procedures such as a panel unit root and a panel cointegration test.

3) In applying risk weight functions, the weight functions were varied in line with the type of exposure, different maturities were used depending upon the type of transaction, and different relationships between the size of an SME business and its retail exposure were considered in accordance with the type of transaction - all in order to reflect the details of the BASEL Ⅱ accord to the maximum extent.

PD estimation model

Corporate model

$$\ln\left(\frac{PD_{i,t}}{1-PD_{i,t}}\right) = -4.71 - 6.95GDP_{t-2} + 6.79RCB_{t-1} + 3.25ULC_t - 1.89NBTT_{t-1}, \quad R^2 = 0.69$$

SME corp. model

$$\ln\left(\frac{PD_{i,t}}{1-PD_{i,t}}\right) = -3.45 - 4.18GDP_{t-3} + 9.78RCB_{t-2} + 5.91ULC_t - 7.77Lf_t, \quad R^2 = 0.93$$

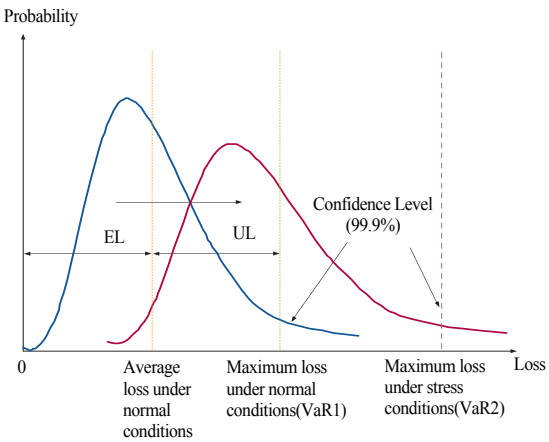
Retail model

$$\ln\left(\frac{PD_{i,t}}{1-PD_{i,t}}\right) = -3.68 + 5.09(UR + CPI - GDP)_{t-3} + 13.72RCB_{t-3} - 3.30WE_{t-2}, \quad R^2 = 0.75$$

Notes: 1) All estimated coefficients were statistically significant at 90% confidence or more.
2) Percentage changes in macroeconomic variables, exclusive of rates of return on corporate bonds and unemployment rates, from the corresponding periods of the previous years

* Variable List
PD : Probability of default; GDP : Gross domestic product; RCB : Rate of return on corporate bonds; ULC : Unit labor cost
NBTT : Net barter terms of trade; UR : Unemployment rate; CPI : Consumer price index; WE : Total household assets
Lf : Liquidity of financial institutions

<Figure 2> **Credit VaR and stress test**



to the different scenarios were calculated for each asset type. The corresponding market VaR for each stress scenario was also calculated, to estimate the capital requirements.

Market $VaR = W\Gamma\sigma\sqrt{\tau}$

Note: W : exposure, Γ : confidence level (99%)
σ : volatility, τ : holding period (10 days)

4. Results of financial system stress testing using BOKST-07 model

Test summary

A financial system stress test was conducted on the portfolios of Korean banks[4] at the end of 2007, using the BOKST-07 model.

The types of risk considered were credit and market risks, with additional analysis conducted on interest rate risk. Concerning operational risk, although operational risk weighted assets (calculated using the standard calculation method)

4) Excluding the Korea Development Bank and the Export-Import Bank of Korea

were taken into account in calculation of the BIS capital ratio, given the absence of an appropriate stress testing methodology for this risk category no scenario-by-scenario stress test was performed.

Initial shocks and macroeconomic scenarios

Based upon current macroeconomic conditions, six types of initial shocks pertaining to the financial, foreign and asset sectors, that may represent potential threats to future financial system stability, were selected-namely, interest rate, equity price, exchange rate, property price, oil price and global economy-related shocks.

The sizes of the shocks related to the six risk factors were distinguished into two levels, moderate and severe, for a total of 12 initial shocks.[5] These initial shocks were then assigned to BOK04, the BOK's macroeconometric model, to generate stress scenarios.

<Table 1> **Types and sizes of initial shocks**

Type	Size	
	moderate	severe
1. Financial Shocks		
① Interest rate rise	300bp	500bp
② Equity price decline	-30%	-50%
③ Exchange rate decline	-20%	-40%
2. Foreign shocks		
④ Oil price spike	100%	150%
⑤ Global recession	Global trade growth at one-half the long-term average rate	0% growth
3. Asset shocks		
⑥ Property price decline	-30%	-50%

5) The sizes of the shocks were determined referring to historically observed values and related precedents from stress tests conducted by other central banks and commercial banks.

Stress test results

(Results of scenario analysis)

Top-down stress testing on Korean banks' portfolios as of the end of 2007, using the 12 macroeconomic stress scenarios, revealed that in a situation of severe stress the BIS ratio for the banking sector as a whole would drop by between 0.53%p and 2.22%p from the baseline value, but still remain 8% or higher under all scenarios. The results further indicated that, even if an external shock caused the rate of defaults to rise, the values of banks' profitability indicators such as ROA and ROE would remain positive, suggesting that the Korean banking system has sufficient capacity to absorb losses due to unforeseen external shocks.

<Table 2> **BIS ratios under different scenarios**

(%, %p)

Scenario	BIS Ratio[1)]
Baseline	10.93
Interest rate shock	8.71 (-2.22)
Stock price shock	10.24 (-0.69)
Exchange rate shock	10.40 (-0.53)
Property price shock	9.00 (-1.93)
Oil price shock	9.52 (-1.41)
Global economic shock	9.78 (-1.15)

Notes: 1) Results under severe shock scenarios
2) Values in parentheses are the differences from the baseline values, in %p.

By scenario, the potential loss for the Korean banking system increased the most upon a hypothetical call rate rise of 500bp-a sign of a high level of vulnerability to interest rates. After that, Korean banks were most vulnerable to property price shocks, oil price shocks and global economic shocks, in that order.

The results of estimating changes in potential loss by exposure under the twelve scenarios (done to assess per-exposure vulnerability to external shocks) showed corporate exposure to be most vulnerable to oil price spikes; small and medium-sized business exposure to interest rate hikes; and retail exposure to a property price decline.

<Table 3> **Changes in potential loss by exposure**

(%)

Scenaio	Corporate	SME Corp	Retail
Interest rates	15.5	25.6	32.0
Stock prices	2.0	1.8	20.6
Exchange rates	3.4	11.8	-3.8
Property prices	6.4	4.6	64.3
Oil prices	15.9	9.7	22.5
Global economy	12.9	11.2	12.7

Note : Results under severe scenarios

Results of sensitivity test

(Analysis of PD sensitivity)

The results of a credit risk sensitivity analysis, assuming a 10% rise of the default rate for all exposures, indicated that the rate of potential loss would increase far more substantially for SME corp. exposure than it would for corporate or retail exposure.

<Table 4> **Changes in potential loss rate due to PD increase**

(%, %p)

	Rate of potential loss[1]		
	Corporate	SME Corp.	Retail
10% increase in default rate	6.4 (0.3)	11.5 (0.4)	4.4 (0.2)
Baseline	6.1	11.1	4.2

Notes : 1) Rate of potential loss = Potential loss / Exposure
2) Values in parentheses are the differences from the baseline values, in %p.

What this finding suggests is that a rise in the default rate triggered by an economic recession is likely to shrink credit supply to SME corporations more than it will to other portfolio segments.

(Interest rate sensitivity analysis)

Analysis of sensitivity to interest rate risk was measured by analyzing changes occurring in the interest rate VaRs[6] of interest rate-sensitive assets and liabilities in response to changes in the yield curve.

$$\text{Interest rate } VaR = \Sigma_i [GAP_i \times D_i \times \triangle R_i]$$

- GAP_i : Interest rate gap in the ith maturity
- D_i : Modified duration for the ith maturity
- $\triangle R_i$: Interest rate shock

Three types of changes in the yield curve were envisioned: upward sloping, downward sloping and humped. The rate of bond yields was assumed to rise regardless of the type of change.

<Table 5> **Hypothetical shocks for interest rate sensitivity analysis**

Type of shock	Upward sloping	Downward sloping	Humped
Short term (1 year or less)	200bp rise	500bp rise	200bp rise
Medium term (Over 1 year but no longer than 3 years)	300bp rise	300bp rise	400bp rise
Long term (Over 3 years)	500bp rise	200bp rise	200bp rise

The results of analysis revealed that interest rate-sensitive Korean Won currency (KRW) assets and liabilities were most sensitive to an upward-sloping yield curve shock. When the yield curve slopes upward, this raises the ratio of the interest rate VaR to the BIS capital ratio to 5.60%. KRW interest rate risk among Korean banks does not appear high, however, as this ratio is still well within the BIS recommended standard (less than 20%).

6) Measured using the standard method suggested by the Basel Committee

5. Overall assessment and implications

The stress test conducted on the Korean banking system, using BOKST-07, found that even under stress Korean banks' BIS capital ratio would not fall below 8%, with most profitability indicators retaining positive values. The Korean banking system's capacity of internal loss absorption in the event of an external shock therefore appeared sound.

This result owed, in great part, to the improved capital adequacy and profitability of Korean banks following restructuring since the financial crisis. Asset quality improvements as a consequence of enhanced loan review and stronger risk management capacities also seem to have contributed to increased banking system stability.

However, the possibility cannot be ruled out that the actual losses sustained by financial institutions might exceed those estimated in this stress test (using single stress scenarios), especially if more than one external shock occurred simultaneously or if an initial shock resulted in second-round effects. To anticipate scenarios in which a combination of shocks-such as an interest rate rise concurrent with a property price decline and a global recession-destabilizes the banking system, it may therefore be necessary during the portfolio adjustment process to step up monitoring of the movements of interest rates and property prices (which according to the results of this test have more severe impacts than other risk factors), as well as the paths of propagation of the related shocks.[7)]

Meanwhile, the entry into force in 2008 of BASEL Ⅱ, which is more sensitive to borrower creditworthiness and credit risk, is likely to incite banks facing stress to either reduce their supplies of credit to firms with lower credit ratings (as the risk capital requirement on loans to these firms is significantly larger), or widen the ranges of their interest rate differentiation in lending. One possible consequence of this, which needs to be closely watched, is a further increase in the credit risks of firms with low credit standings, which would in turn worsen the problem of shrinking credit supply.

The significance of the BOKST-07 model resides in the fact that it is a tool for quantitative evaluation of the stability of a financial system faced with an exceptional but plausible shock.

To increase the model's precision and practical relevance, however, it is necessary to (1) further strengthen its robustness through continuous accumulation and management of data; (2) refine its analytical techniques to achieve more accurate measurement of risk levels, by taking into account the characteristics of individual financial products including derivatives; and (3) consider complex financial crisis situations, involving several types of shocks simultaneously, as well as the second-round effects of a crisis such as inter-institution contamination and the interaction between the financial and real sectors.

7) It is also possible that the actual volume of losses could turn out to be smaller than estimated under this stress test, as the test assumes neither adjustment of portfolios on the parts of the financial institutions nor intervention by the government in the face of a stress situation.

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