# Characteristics of international banks' claims on Korea and their implications for monetary policy

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## 1. Introduction

The activities of international banks have become an important component of financial globalisation since the mid-1990s. Facilitated by financial liberalisation, international banks have been one of the major financial sources for the development of emerging market economies in recent years. Their increased role in emerging market economies has raised questions about their impact on domestic economies and their implications for monetary policy.

International banks' capital inflows have potentially important implications for financial and macroeconomic stability in recipient countries, and arguments as to whether these implications are positive or negative have been made in both directions. On the one hand, it has been argued that foreign banks can contribute to rapid financial and economic development by efficiently allocating resources, playing a stabilising role in the supply of foreign exchange credit, and transferring valuable banking technology and expertise. On the other, it is claimed that international banks may suddenly expatriate funds from emerging markets and thereby increase financial risks in domestic economies. Moreover, international banks can be one of the main channels to transmit crises from advanced economies to the emerging markets, as evidenced by the recent global financial crisis of 2007–08. It has also been argued that the increasing role of international banks complicates the main transmission channels of monetary policy.

The structure of this note is as follows. Section 2 describes the characteristics of international banks' claims on Korea, followed by Section 3, which reviews their impacts on the domestic financial system and economic activities. Section 4 discusses the implications for monetary policy and the transmission mechanism of international banks' activities in Korea, and the last section briefly summarises the main implications and points out the challenges ahead.

## 2. Characteristics of international banks' claims on Korea

International banks' claims on Korea have been on the rise. Total outstanding claims of international banks on Korea (direct cross-border claims of head offices and indirect local claims of foreign branches and subsidiaries) increased from $47.8 billion at the end of 1993 to $76.8 billion at the end of 2000 and $368.7 billion at the end of 2010. Over the same years, the ratios of total foreign claims to Korea's GDP were 12.8%, 16.1%, and 36.3%, respectively, also showing an upward trend.

Some stylised facts on international banks' claims on Korea are as follows:

First, during the last 15 years, international banks' claims on Korea showed considerable volatility before and after the two financial crises: the Asian foreign currency crisis and the

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global financial crisis. In the 1990s, international banks' capital inflows to Korea increased mainly due to a rise in overseas direct investment used to offset the current account deficit, but they declined sharply after the Asian foreign currency crisis. Net capital flows in 1998 were –$27.6 billion, in contrast to a total of $43.2 billion between 1995 and 1997. In the same manner, in the mid-2000s, international bank inflows to Korea increased dramatically, encouraged by strengthened arbitrage incentives and the hedging demands of domestic companies in expectation of Korean won appreciation. They then showed a rapid decrease after the global financial crisis. While net capital flows between 2005 and 2007 totalled $214.8 billion, the figure in 2008 was –$74.8 billion. Although capital flows shifted back to an increase in 2009, the volume remains at a low level compared to the period before the crisis. Total outstanding foreign claims on Korea at the end of 2007 were greater than those at the end of September 2010, at $374.6 billion and $368.7 billion, respectively.

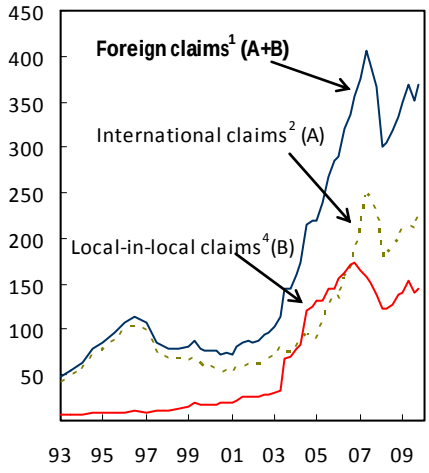
Second, dividing international banks' claims on Korea into cross-border and local claims, we find significant differences within time periods. In the 1990s, cross-border claims of head offices took up most of the foreign claims on Korea. Local claims of foreign branches started to increase in 2005, but cross-border claims again increased rapidly after restrictions were placed on fund-raising between head offices and their foreign branches in July 2007. Both types of claims decreased during the 2008 global financial crisis, but have turned to increasing trends since 2009 (Graph 1).

Graph 1

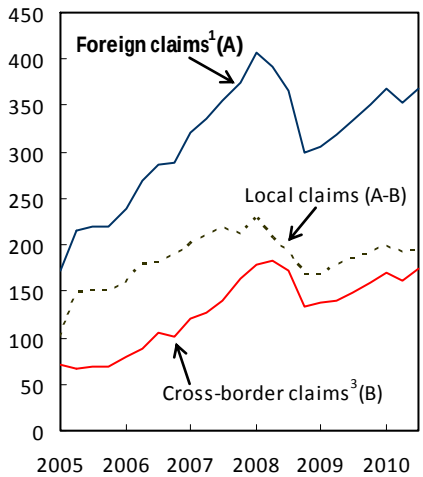
**International banks' claims on Korea**

In billions of US dollars

**Local currency versus foreign currency claims**




**Direct versus indirect claims**




[1] Foreign claims = international claims + local-in-local claims. [2] International claims = cross-border claims + local-in-foreign claims. [3] Cross-border claims = claims of international banks' head offices. [4] Local-in-local claims = local currency claims of foreign affiliates. [5] Local-in-foreign claims = foreign currency claims of foreign affiliates.

Source: BIS consolidated banking statistics.

Third, the ratio of international banks' claims on Korea to its nominal GDP was 36.3% at the end of 2010, a figure that is very high compared to other major emerging countries. The increasing trend of capital inflows has also been very strong compared to other emerging countries. Between 2004 and 2010, the ratio of foreign claims to GDP rose by 16.2 percentage points (Table 1).

Table 1

**International banks' claims on emerging market economies**

As a percentage of nominal GDP

| Country | 2004 (A) | 2005 | 2006 | 2007 | 2008 | 2009 | Sep 2010 (B) | B–A |
|---|---|---|---|---|---|---|---|---|
| Brazil | 16.3 | 17.4 | 19.6 | 20.5 | 21.3 | 21.4 | 22 | 5.7 |
| Peru | 18.5 | 19.3 | 16.7 | 22.6 | 26.7 | 23.9 | 24.7 | 6.2 |
| Thailand | 24.5 | 25.1 | 24.1 | 21.7 | 21.5 | 24.5 | 25.3 | 0.8 |
| Taiwan | 22 | 21.8 | 21 | 27.5 | 23.9 | 28.6 | 32.5 | 10.5 |
| Korea | 20 | 25.7 | 29.6 | 36 | 36.8 | 38.3 | 36.3 | 16.2 |
| Indonesia | 15.2 | 15.9 | 15.2 | 16 | 14.7 | 12.7 | 13.9 | –1.3 |

Source: BIS consolidated banking statistics.

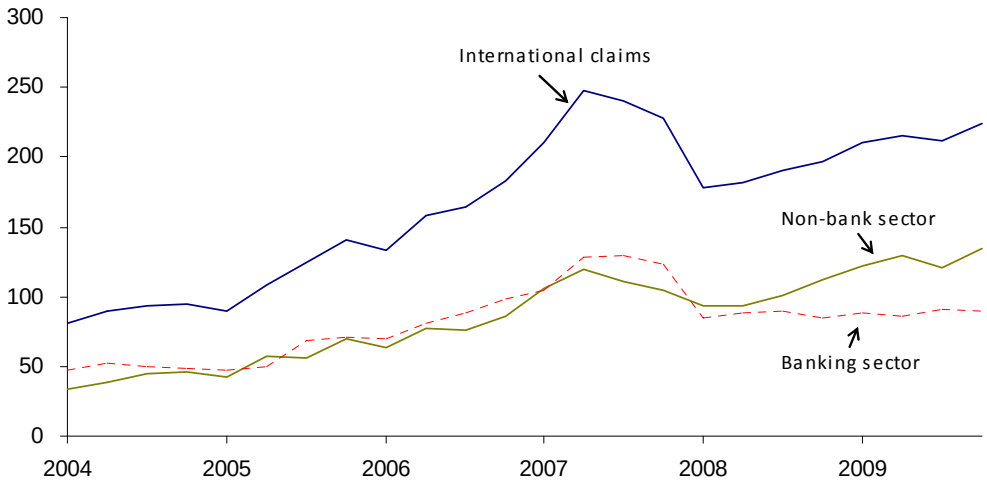
Fourth, until 2008, the volume of loans to the banking sector had been similar to that of loans to the non-banking sector, including the public sector and private companies. Since 2009, however, loans to the non-banking sector have rapidly recovered, while loans to banks have stagnated (Graph 2).

Lastly, the volume of local claims in foreign currency and in Korean won together is larger than that of cross-border claims. As of September 2010, the local claims-to-GDP ratio was 19.1%, whereas the cross-border claims-to-GDP ratio was 15.7%. However, the trend of increase in cross-border claims is stronger than that in local claims. Between 2004 and September 2010, their claims-to-GDP ratios rose by 8.6 and 6.7 percentage points, respectively. The ratio of local claims in Korean won to Korea's nominal GDP was 14.2% at the end of September 2010, very high compared to the 4.9% ratio of local claims in foreign currency to GDP (Table 2).

Graph 2

**International banks' claims, by sector**

In billions of US dollars




Source: BIS consolidated banking statistics.

Table 2

**International banks' claims on emerging market economies, by type**

As a percentage of nominal GDP

| Country | 2004 (A) | 2005 | 2006 | 2007 | 2008 | 2009 | Sep 2010 (B) | B–A |
|---|---|---|---|---|---|---|---|---|
| **Cross-border claims** | | | | | | | | |
| Brazil | 4.9 | 5.3 | 6.1 | 6.8 | 7.7 | 8.0 | 8.4 | 3.5 |
| Peru | 3.8 | 8.5 | 4.0 | 6.3 | 6.7 | 4.6 | 5.7 | 2.0 |
| Thailand | 5.3 | 5.6 | 6.3 | 5.5 | 5.7 | 6.2 | 5.3 | 0.0 |
| Taiwan | 7.3 | 6.9 | 7.0 | 8.4 | 4.7 | 10.0 | 12.6 | 5.3 |
| Korea | 7.1 | 7.4 | 9.2 | 14.0 | 14.8 | 15.5 | 15.7 | 8.6 |
| Indonesia | 5.0 | 4.8 | 4.8 | 6.4 | 5.8 | 4.7 | 5.9 | 0.9 |
| **Local-in-foreign claims** | | | | | | | | |
| Brazil | 0.4 | 0.9 | 0.8 | 0.4 | 0.3 | 0.3 | 0.5 | 0.1 |
| Peru | 6.7 | 5.2 | 9.0 | 8.6 | 12.0 | 10.9 | 10.1 | 3.4 |
| Thailand | 3.9 | 4.9 | 2.4 | 1.4 | 1.7 | 1.9 | 1.7 | -2.2 |
| Taiwan | 2.0 | 3.2 | 2.5 | 2.2 | 2.6 | 3.1 | 4.6 | 2.7 |
| Korea | 2.4 | 2.4 | 3.4 | 4.3 | 5.5 | 5.6 | 4.9 | 2.5 |
| Indonesia | 4.1 | 3.6 | 3.0 | 2.7 | 3.0 | 2.2 | 1.9 | -2.3 |
| **Local-in-local claims** | | | | | | | | |
| Brazil | 9.1 | 10.9 | 12.3 | 13.1 | 13.1 | 12.8 | 13.0 | 3.9 |
| Peru | 4.8 | 4.8 | 3.3 | 6.7 | 7.0 | 7.6 | 7.7 | 2.9 |
| Thailand | 12.8 | 12.8 | 13.8 | 13.6 | 13.0 | 15.5 | 17.0 | 4.2 |
| Taiwan | 9.8 | 10.0 | 10.5 | 16.5 | 16.3 | 14.8 | 14.1 | 4.3 |
| Korea | 10.0 | 15.3 | 15.9 | 15.8 | 15.0 | 15.4 | 14.2 | 4.2 |
| Indonesia | 2.9 | 4.0 | 4.3 | 4.1 | 3.6 | 3.8 | 4.0 | 1.1 |

Source: BIS consolidated banking statistics.

# 3. Effects of capital inflows from international banks

## 3.1 Positive effects

International banks have contributed to economic growth both directly, by stimulating investment through the supply of foreign capital, and indirectly, by inducing development in financial industries and improving macroeconomic policy discipline (Kose et al (2006)).

Many empirical studies, including Dages et al (2000), EBRD (2009), and Herrmann and Mihaljek (2010), confirm that the supply of funds to emerging economies by international banks has a positive impact on financial and macroeconomic stability.

### *3.1.1 Stable supply of foreign capital*

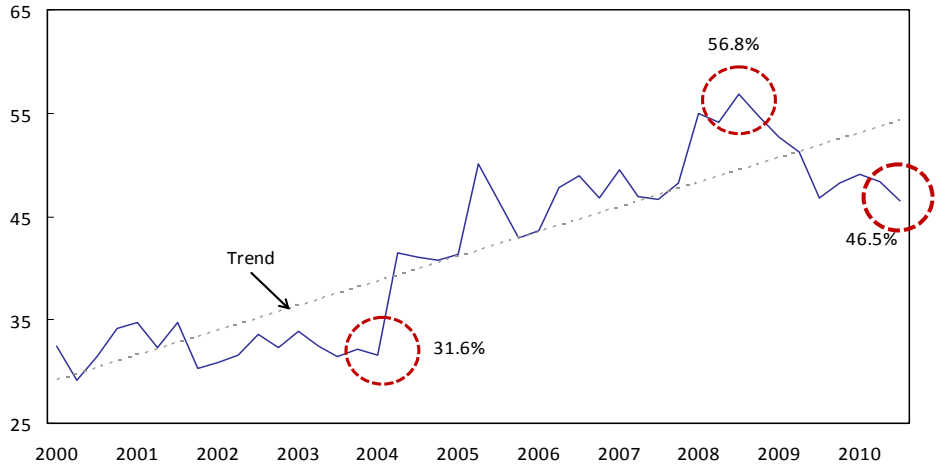
International banks have functioned as a stable supplier of low-cost foreign capital to Korea. The ratio of international bank claims to Korea's total international investment position (IIP) liabilities rose from 31.6% in 2004 to 46.5% at the end of 2010 (Graph 3).

Since the mid-2000s, Korea has been very active in raising foreign currency funds, especially through foreign bank branches. The share of total foreign debt that was financed by foreign bank branches increased from 32% at the end of 2004 to 39% in 2010 (Graph 4). Foreign bank branches have provided relatively inexpensive foreign capital, as they have brought the funds from their own countries, paying a low cost (Graph 5).

Graph 3

**Ratio of international bank claims to IIP liabilities**

In per cent

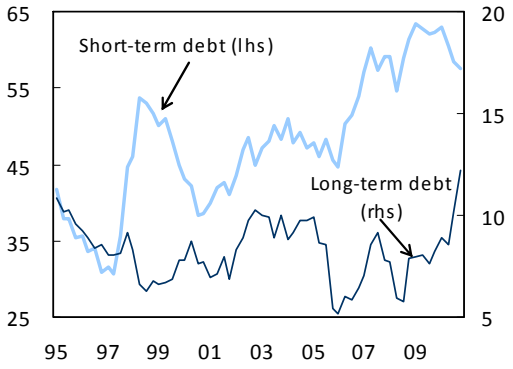



Sources: Bank of Korea; BIS.

Graph 4

**Ratio of foreign debt from foreign bank branches to total foreign debt**

In per cent

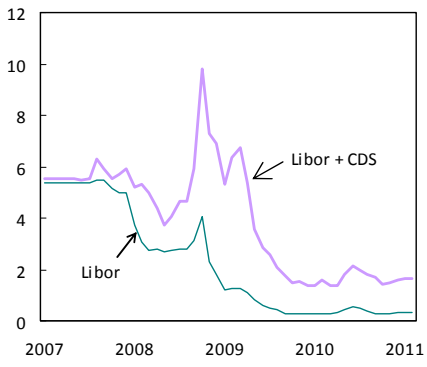



Source: Bank of Korea.

Graph 5

**Domestic banks' borrowing conditions**[1]

In per cent




[1] Average of Kookmin, Shinhan, Hana and Woori Banks.

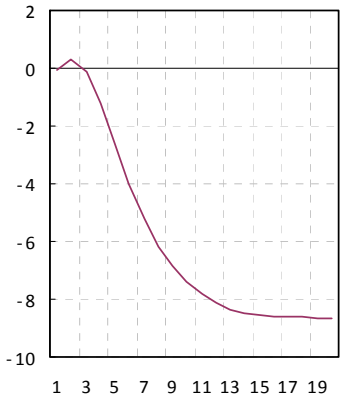
Source: Bloomberg.

### *3.1.2 Contributing to deepening of financial markets*

Capital inflows from international banks are accompanied by the collateral benefits of domestic financial industry development: they expand competition for domestic banks, propagate management techniques and strengthen surveillance. In Korea, empirical analysis suggests that a 1% increase in capital inflows from international banks reduces domestic banks' bid-ask interest rate spread by 0.08 percentage points over 12 quarters (Graph 6).

Graph 6

**Changes in interest rate spread following 1% increase in international claims**[1]

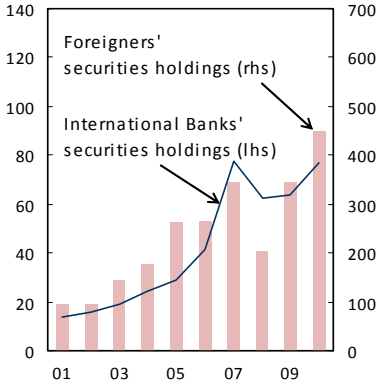



[1] In basis points. Derived from VAR model composed of six variables (foreign real interest rates, exchange rates, increase in international banks' claims, increase in domestic banks' claims, domestic real interest rates and interest rate spread (loan rate-deposit rate).

Source: Author's calculations.

Graph 7

**Securities holdings of foreigners and international banks**

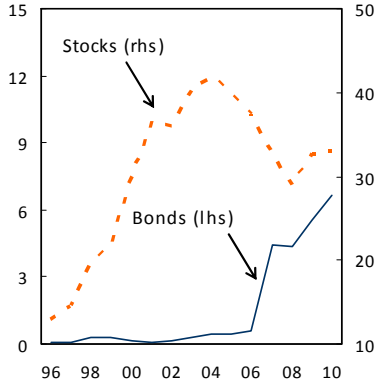



[1] In trillions of Korean won. [2] In billions of US dollars.
Sources: Korea's Financial Supervisory Service (FSS); BIS.

Graph 8

**Foreigners' securities ownership**

In per cent




Source: FSS.

International banks also contribute to expansion of the demand base in the domestic capital market. The share of foreigners' investments, mainly those of international banks, in Korea's domestic stock and fixed income markets has increased consistently (Graph 7). Since the mid-2000s, the pattern of international banks' investment in securities has changed, similarly to that of the investment behaviour of foreigners as a whole in securities. In the fixed income market, the share of bonds owned by foreigners has risen from 0.5% at the end of 2004 to 6.6% as of February 2011. In the stock market, meanwhile, the share of stocks owned by foreigners rose to 42% in 2004, then fell to 29% at the end of 2008, and has now increased again to 32% as of February 2011 (Graph 8).

## 3.2 Negative effects

### *3.2.1 Increase in financial system risks*

The fund management behaviour of international banks is very closely associated with financial system stability in emerging market countries. When there is a large difference between a financial institution's foreign currency assets and foreign currency debts (currency

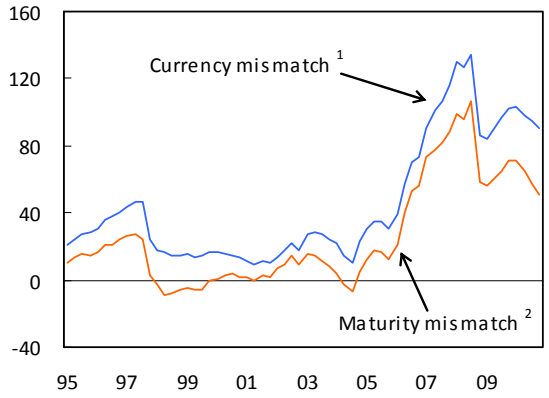
mismatch), or between its short-term foreign currency assets and short-term foreign currency debts (maturity mismatch), the risk of experiencing a foreign currency liquidity crisis is high.

Korean banks' currency and maturity mismatches have increased greatly since the mid-2000s. They have abated somewhat in the wake of the global financial crisis, but remain elevated (Graph 9). As banks' short-term debts, mainly those of foreign bank branches, increased sharply during 2006 and 2007, the external debt structure of Korea weakened and the amount of net external assets in debt instruments decreased rapidly (Table 3). This aggravated the foreign exchange market's instability during the global financial crisis, because unease about the capability of Korea to redeem its foreign debts spread among foreign investors.

Graph 9

**Banks' currency and maturity mismatches**

In billions of US dollars




[1] Banks' net external debt. [2] Banks' short-term debt –short-term assets.

Source: Bank of Korea.

Table 3

**Companies' forward exchange net sales, and banks' foreign debts**

In billions of US dollars

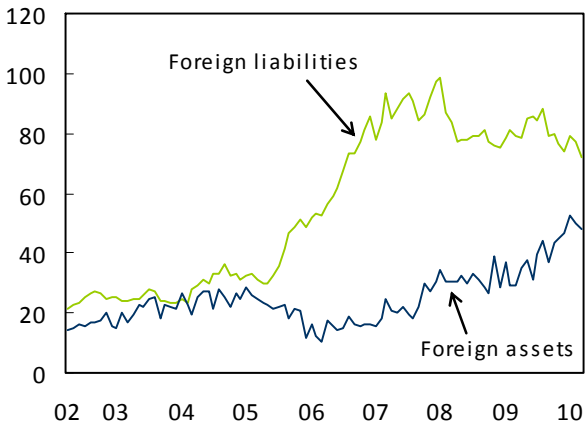
| | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| Forward exchange net sales | 29.2 | 49.3 | 71.8 | 62 |
| (Shipbuilders) | 6.8 | 35.3 | 53.3 | 40.9 |
| Banks' foreign debts | 8.9 | 5.1 | 56.3 | –23.5 |
| (Branches of foreign banks) | 1.1 | 29.4 | 29.5 | –11.5 |

Source: Bank of Korea.

Graph 10

**Currency mismatches of foreign bank branches**

In billions of US dollars

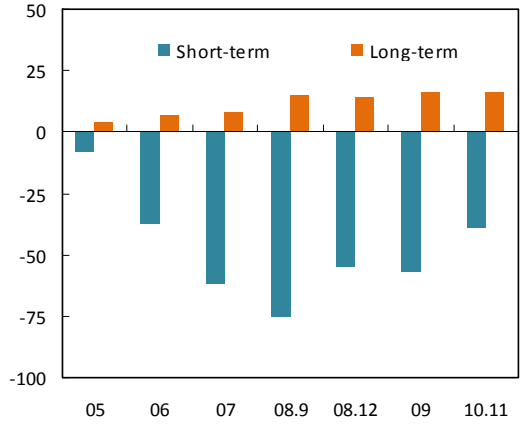



Source: Bank of Korea.

Graph 11

**Maturity mismatches of foreign bank branches**

In billions of US dollars




Source: Bank of Korea.

Since 2005, the currency and maturity mismatch problems of the banking sector have come to the fore mainly at foreign bank branches. Foreign bank branches' currency mismatches reached a peak of –$73.7 billion at the end of March 2008, 11 times greater than the domestic banks' contemporary currency mismatches of –$6.7 billion (Graph 10). Meanwhile, foreign bank branches' maturity mismatches at the end of September 2008 amounted to –$60 billion, six times those of domestic banks (Graph 11).

### *3.2.2 Expansion of cyclical fluctuations*

Foreign capital inflows to Korea are procyclical. This is most apparent for foreign debts and borrowings, and arises because the funding cost of capital for foreign borrowing becomes cheaper as the sovereign risk premium is reduced during economic booms, while the opposite occurs during economic downturns (Table 4).

Table 4

**Ratio of net foreign capital inflows to GDP**

| | Total flow | FDI | Equity | Debt | Borrowing | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Short | Long | Bank | Short | Long |
| Boom | 3.75* | 0.65 | 0.47 | 1.83** | 0.81* | 1.19** | –0.38 | 1.14* | 1.19** | –0.05 |
| Downturn | 0.76* | 0.81 | 1.13 | 0.37** | –1.57* | –2.02** | 0.45 | –1.19* | –1.63** | 0.44 |

Analysis between Q1 1998 and Q4 2010. The economic booms and downturns are distinguished by comparison between year-on-year real GDP growth rates and year-on-year long-term trend rates.

* and ** imply statistical significance at the 10% and 5% levels, respectively, during the booms and downturns.

Granger causality tests between foreign capital inflows and GDP suggest that long- and short-term foreign borrowing clearly Granger-causes GDP, while it is hard to find statistically significant causality between other forms of foreign capital inflows and GDP. As for short-term borrowing, unidirectional causality from foreign borrowing to GDP exists, along with bidirectional causality between long-term borrowing and GDP (Table 5).

In the process, the foreign exchange rate acts as a financial accelerator. For example, during economic booms the expectation of currency appreciation brings about banks' foreign capital inflows, while during downturns the reverse happens: the procyclicality of capital inflows expands through the exchange rate. Generally, there is a positive correlation between currency value and economic growth, as shown in Graph 12. In the case of Korea, when it showed around 5% annual GDP growth in 2005–07, foreign capital inflows increased as the expectations of currency appreciation caused a rise in the swap rate and a positive arbitrage condition level (Graph 13).

Table 5

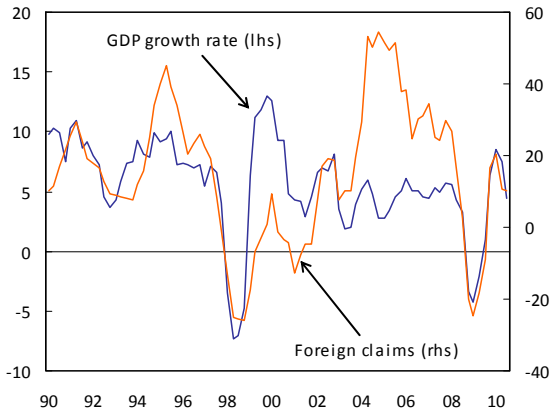
**Granger causality tests between foreign capital flows and GDP**

| Null hypothesis | | | *k* = 1 | *k* = 2 | *k* = 3 | *k* = 4 |
|---|---|---|---|---|---|---|
| Total | ⇏ | GDP | 2.24 | 0.83 | 0.53 | 0.63 |
| Total | ⇍ | GDP | 1.8 | 2.12 | 1.87 | 1.3 |
| FDI | ⇏ | GDP | 1.29 | 0.7 | 0.47 | 0.71 |
| FDI | ⇍ | GDP | 0.19 | 0.15 | 0.59 | 0.45 |
| Equity | ⇏ | GDP | 0.78 | 0.41 | 0.31 | 0.26 |
| Equity | ⇍ | GDP | 0.03 | 0.01 | 0.16 | 0.13 |
| Debt | ⇏ | GDP | 0.89 | 0.25 | 0.77 | 0.49 |
| Debt | ⇍ | GDP | 1.08 | 1.72 | 1.54 | 1.19 |
| Borrowing | ⇏ | GDP | 2.2 | 1.08 | 0.4 | 0.31 |
| Borrowing | ⇍ | GDP | 0.18 | 1.45 | 1.58 | 1.18 |
| Short-term | ⇏ | GDP | 1.03 | 1.58 | 1.1 | 0.87 |
| Short-term | ⇍ | GDP | 20.42*** | 8.55*** | 5.31*** | 3.77** |
| Long-term | ⇏ | GDP | 0.94 | 9.35*** | 2.45* | 0.98 |
| Long-term | ⇍ | GDP | 51.05*** | 15.24*** | 8.35*** | 6.06*** |
| Total | ⇏ | GDP | 2.24 | 0.83 | 0.53 | 0.63 |

*, ** and *** imply statistical significance at the 10%, 5% and 1% levels, respectively, during the booms and downturns.

Graph 12

**GDP growth rate and changes in foreign claims**

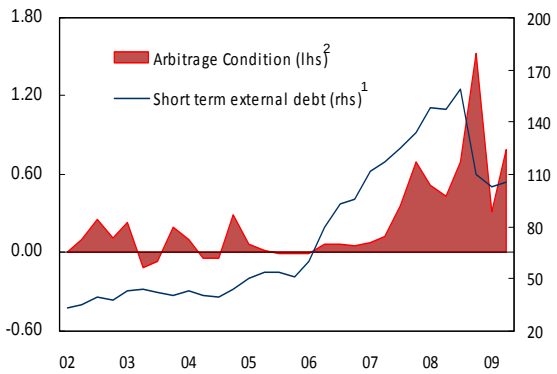



[1] Year on year, in per cent.

Sources: Bank of Korea; BIS.

Graph 13

**Arbitrage condition and short-term external debt**




[1] In billions of US dollars. [2] In per cent.

Sources: Bank of Korea; Bloomberg; author's calculations.

## 4. Implications for monetary policy

The increasing role of international banks affects the transmission of monetary policy through the interest rate, exchange rate and credit channels.

### 4.1 Interest rate channel

Capital inflows from international banks can limit the effect of monetary policy because they weaken the connection between long- and short-term interest rates by pushing the former down. In 2005–06, for example, with capital financed from their main offices, the branches of international banks exchanged US dollars for won through CRS trades with Korean domestic banks and invested the won in domestic bonds, pressuring market interest rates to fall. Also in 2007 and in 2009–10, the increase in international banks' head offices' investment in Korean treasury bonds, for buy and hold purposes, restrained the rise of long-term interest rates, despite the rise in the policy rate (Graphs 14 and 15).

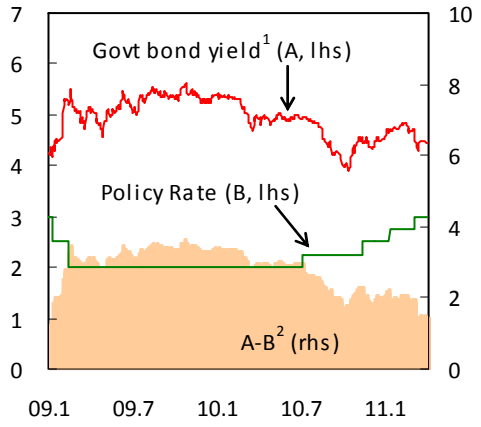
We estimated the following model of Peiris (2010) in order to empirically confirm the effect of foreign capital inflows on the treasury bond yields.

$$LR_{i,t} = \alpha_i + \beta_1 Sr_{i,t} + \beta_2 \pi_{i,t} + \beta_3 b_{i,t} + \beta_4 d_{i,t} + \beta_5 m_{i,t} + \beta_6 y_{i,t} + \beta_7 USr_t + \beta_8 CA_{i,t} + \beta_9 FP_{i,t} + \varepsilon_{i,t}$$

where *LR* is the long-term interest rate, *Sr* is the policy rate, $\pi$ is inflation, *b* equals budget balance / GDP, *d* is government debt, *m* is monetary (M2) increase rate, *y* equals the GDP growth rate, *USr* is American bond interest rate, *CA* is current account deficit / GDP, and *FP* equals the share of foreign investors in the bond market.

Graph 14

**Long-term market rate and short-term policy rate**



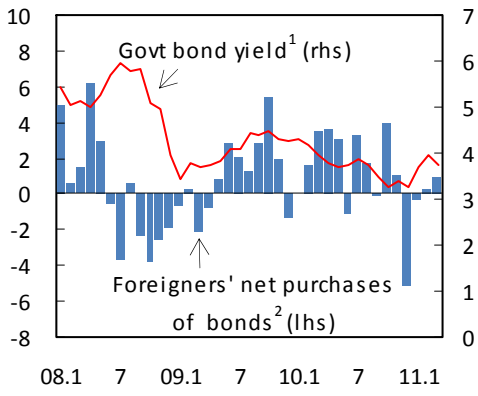

25 basis point hikes in July and November 2010, and January and March 2011.

[1] Ten-year government bond yield, in per cent. [2] In percentage points.

Source: Bank of Korea.

Graph 15

**Foreign investment in bonds, and interest rates**




[1] Three-year government bond yield, in per cent. [2] In billions of US dollars.

Sources: Bloomberg; FSS.

Table 6

**Analysis of determinants of national bond interest rate**

| | Coefficient | P-value |
|---|---|---|
| Constant | 4.195 | 0.000 |
| Policy rate | 0.445 | 0.000 |
| Inflation | 0.046 | 0.000 |
| Fiscal balance / GDP | 0.011 | 0.006 |
| CA deficit / GDP | 0.025 | 0.101 |
| **Foreign participation** | **–0.051** | **0.000** |
| Adj $R^2$ | 0.938 | |
| F-statistics | 252.904 | 0.000 |

Source: Author's calculations.

Panel data for Q1 2000 – Q3 2010 from four Asian developing nations (Korea, Indonesia, Malaysia and Thailand) were used, with the insignificant variables excluded by the general-to-specific method. The fixed effects were considered, allowing for the heterogeneities in levels and variations of nations' interest rates.

Empirical analysis showed that when the rate of foreign investment increased by 1%, market interest rates decreased by about 5 basis points (Table 6).

### 4.2 Exchange rate channel

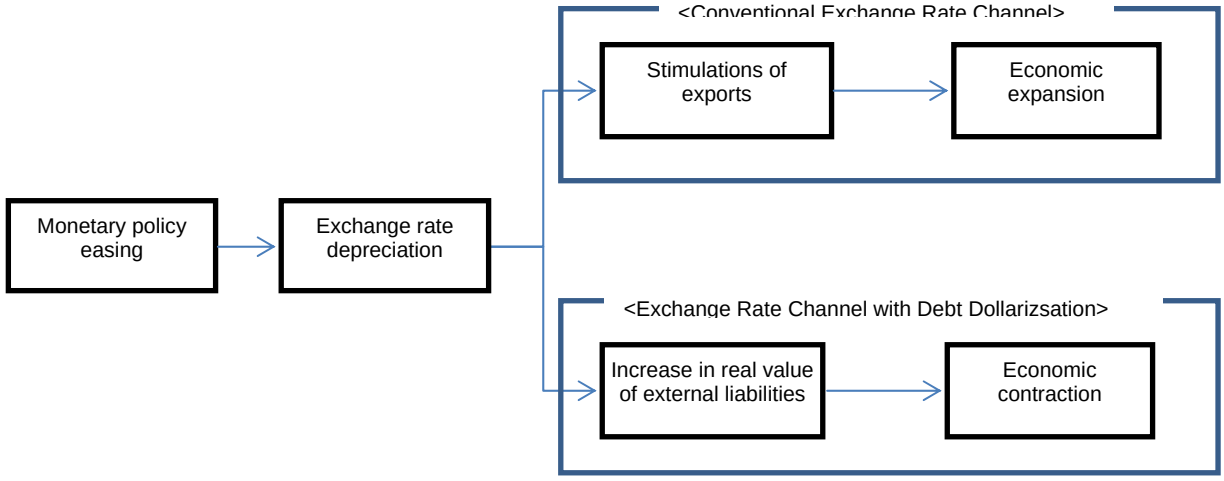
The capital inflow from international banks influences the exchange rate channel of monetary policy by changing the connection between the exchange rate and economic fluctuations. According to the analyses of Calvo (2001) and Kamin and Rogers (2000), if the exchange rates of newly developing nations with external debts increase (depreciation), the effects of economic retrenchment due to the burden of debt redemption, ie negative balance sheet effects, could be bigger than the effects of economic expansion due to improved exports.

With reference to the existing analysis of exchange rate effects on total demand,[2] analysis was conducted on Korea.

[2] Related research includes (i) research using VAR (eg Rogers and Wang (1995), Copelman and Werner (1996), Hoffmaister and Vegh (1996), Kamin and Rogers 2000), (ii) research using regression analysis (eg Agenor (1991), Cespedes (2005), Galindo et al (2003)) and (iii) research using micro data (eg Bleakley and Cowan (2002), Harvey and Roper (1999), Aguiar (2005), Martinez and Werner (2002)).

Graph 16

**Change of exchange rate channel due to debt dollarisation**




### *4.2.1 VAR analysis*

First, we estimate a VAR model for Q1 1990 – Q4 2010 composed of seven variables: foreign interest rate, domestic interest rate, real exchange rate, current account / GDP, real bank loans, inflation and real GDP.

When the exchange rate varies due to changes in internal and external interest rates, two contrary effects on GDP are shown – through current account changes (conventional exchange rate channel) and credit sector changes (exchange rate channel with debt dollarisation).

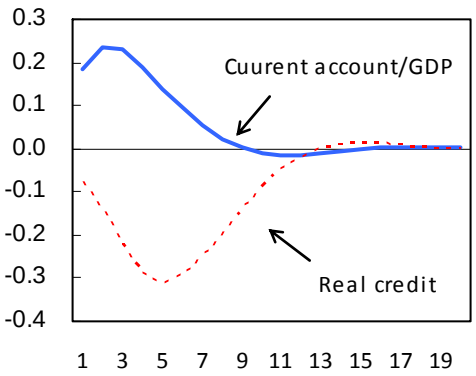
The results show that when the exchange rate increases (won depreciation), regardless of improvement in the current account, economic activity contracts due to a decline in real credit (Graph 17).

Graph 17

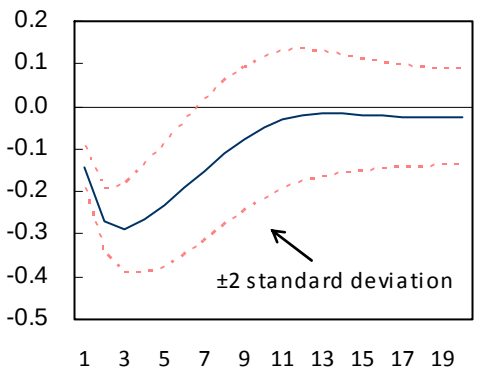
**Impulse response to real exchange rate shock (1%)**

In per cent

**Current account and credit**




**Output**




Source: Author's calculations.

### *4.2.2 Regression analysis*

Next, regression analysis was conducted on the following equation:

$$\Delta Y_t = \beta_1 + \beta_2 \Delta e_t + \beta_3 (\Delta e_t \times Debt_t) + rX_t + \varepsilon_t$$

where $\Delta Y_t$ equals GDP growth rate, $\Delta e_t$ is real exchange rate fluctuation, $Debt_t$ is external debt/GDP and $X_t$ equals other controlled variables (private sector credit / GDP, US interest rate, US growth rate and terms of trade) for the period Q1 1994 – Q4 2010.

Exchange rate fluctuation has a positive effect on growth rate due to the improvement of the current account $(\beta_2 > 0)$, but also a negative effect that correlates positively to the quantity of external debts $(\beta_3 > 0)$,. The ultimate net effect on GDP of exchange rate fluctuation in the period *t* therefore depends upon the level of external debt $(\beta_t = \Delta Y_t / \Delta e_t = \beta_2 + \beta_3 Debt_t)$.

The analysis results, $\beta_2$ = 0.22 (*t*-statistic: 2.07) and $\beta_3$ = –0.94 (*t*-statistic: –3.22), show that when the ratio of external debt to GDP is 23.8% $(= -\beta_2 / \beta_3)$ or greater, the exchange rate effect on GDP is negative (Graph 18). In the early 2000s, the effect remained positive, but when external debt increased rapidly from 2007, the effect turned negative.

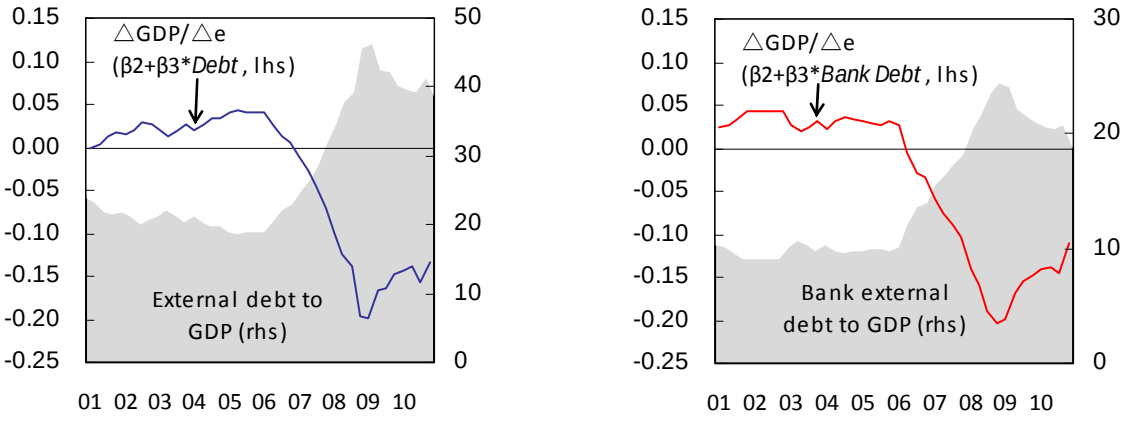
$$\Delta Y_t = \beta_1 + \beta_2 \Delta e_t + \beta_3 (\Delta e_t \times Banks\ Debt_t) + \gamma X_t + \varepsilon_t$$

Also, when analysed using total external debt instead of banks' external debts, the results showed $\beta_2$ = 0.19 (*t*-statistic: 2.06) and $\beta_3$ = –1.60 (*t*-statistic: –3.35), indicating that when the external debt ratio is at or over 11.7% $(= -\beta_2 / \beta_3)$, the effect of the exchange rate on GDP becomes negative (Graph 18).

Graph 18

**Relationship between real exchange rate and GDP growth rate**

In per cent

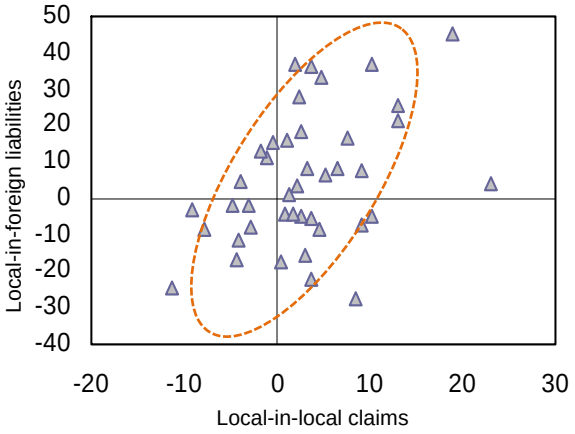



Source: Author's calculations.

Graph 19

**Foreign currency liabilities and local currency claims of foreign bank affiliates**

Year on year, in per cent

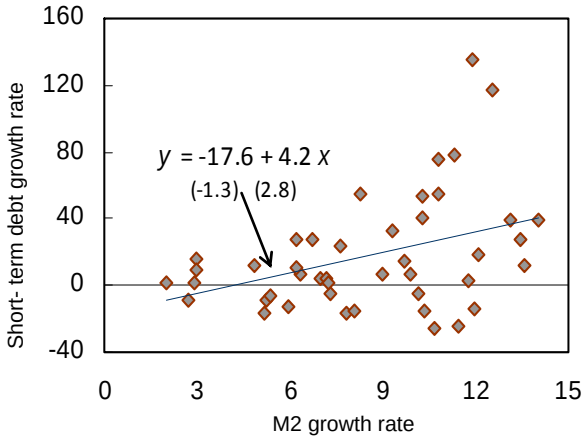



Sources: Author's calculations; BIS.

Graph 20

**Relationship between foreign borrowing and domestic liquidity**

In per cent




Sources: Bank of Korea; author's calculations.

## 4.3 Credit channel

Capital inflows through international banks influence domestic monetary policy conditions through the credit channel, which can be subcategorised into two channels: (i) the bank lending channel, and (ii) the money supply channel.

First, through the bank lending channel, an increase in foreign borrowing expands the lending sources of financial institutions, which leads to credit growth resulting in an economic boom (Graph 19). Second, through the money supply channel, the money supply increases during the process of the authority's intervention in the foreign exchange market in response to the expansion of foreign capital inflows (Graph 20).[3]

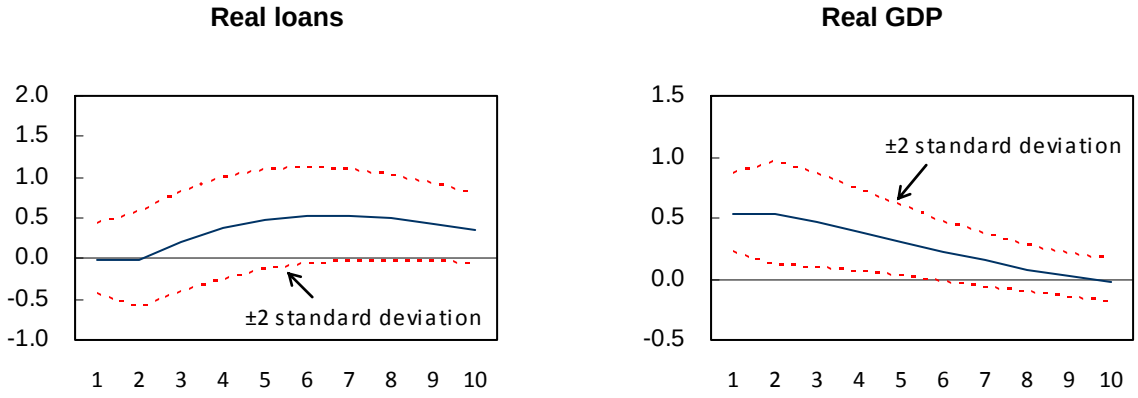
Estimations using a three-variable VAR model (cyclical factors of real GDP, real loan and real capital inflows) also show that banks' foreign borrowing causes increases in real loans and real GDP (Graph 21).

[3] Fully sterilised foreign exchange intervention by the monetary authority does not give rise to money growth. In this case, however, money growth could be brought about since the issuance of monetary stabilisation bonds increases payments of interest on them.

Graph 21

**Responses of credit and output variables to foreign borrowing shock**

In per cent




Source: Author's calculations.

## 5. Challenges ahead

International banks' claims on Korea are huge, and they cause a high level of capital flow volatility compared to other major emerging countries. Since the recent global financial crisis, cross-border claims through international banks' head offices have been growing rapidly, while the trend of increase in local claims through foreign banks' branches has eased.

The analysis on international banks' claims suggests the following policy implications:

First, international banks' claims have positive impacts through the provision of stable sources of foreign funds and indirect spillover effects. However, these positive effects are accompanied by negative influences on the domestic economy as well: increased economic volatility and unrest in the financial system. Therefore, policy efforts to prevent the negative impacts derived from international banks' claims are needed.

Second, the expansion of international banks' claims causes uncertainty surrounding monetary policy conditions to increase, thus making monetary policy operations difficult. The monetary authority needs to deal appropriately with changes in the monetary policy transmission mechanism by analysing their effects on long-term interest rates and exchange rates.

Third, as a countermeasure to increased volatility in capital inflows and outflows, robust economic fundamentals should be sustained through operation of stable macroeconomic policies, complemented by a strengthening of prudential policies. In particular, Korea needs to make sustained efforts towards the successful implementation of its recently adopted macroprudential measures.[4]

Fourth, efforts to narrow information gaps between financial institutions and the policy authorities should be intensified, to alleviate risks stemming from capital inflows and outflows

[4] These macroprudential measures include ceilings on banks' FX derivatives positions (from October 2010), flexible withholding taxation on foreigners' Korean treasury bond and monetary stabilisation bond investment (from January 2011), and a macroprudential stability levy on non-core foreign currency liabilities (to be introduced in the second half of 2011).

and to ensure the stability of the financial sector. Elaboration on statistics about international banks' claims is especially important to prevent the maturity mismatch problem that could easily result from increases in those claims.

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