

Lessons from Asia's Experiences with Sudden Capital Flows

2011.2.

Korea Institute of Finance

I. Introduction

At the height of the global financial crisis, emerging economies experienced sudden capital outflows and the subsequent economic crisis in spite of their strong economic fundamentals because of the credit crunch that originated in advanced economies. These open emerging countries were reminded again of the importance of maintaining foreign exchange soundness of financial institutions and curbing excessive borrowing in foreign currency in normal times so as to manage better the threats to financial stability that arise from sudden reversals in capital flows.

Within the G20, a consensus has been already reached on the need for strengthening the prudential regulation in the banking sector. Consistent with this, the Korean government has introduced recently new measures to mitigate the potential systemic risks arising from sudden imbalances in the supply and demand for foreign exchange, while staying within the broad framework of maintaining an open and liberalized capital market.

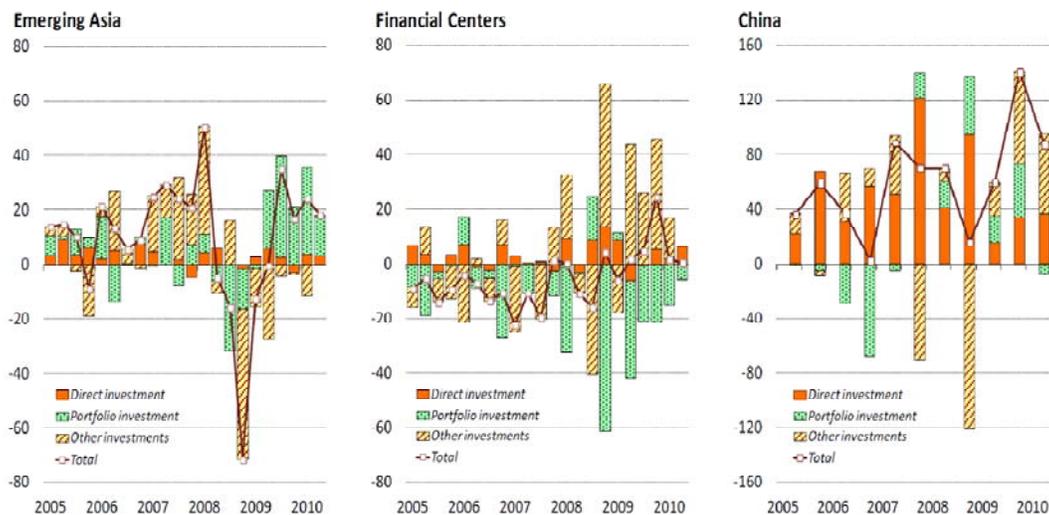
In this report, we examine recent trends in capital flows to Asia and its characteristics. Then we review policy responses of selected Asian economies to cope with these inflows and draw some policy implication for managing the risk of large capital inflows. Chapter II overviews the surge in capital flows to Asia. Chapter III focuses on various prudential measures that were adopted to manage capital flows. Based on these experiences, chapter IV draws some policy recommendations for other developing open economies.

II. Surges of Capital Flows to Asia¹

1. Sudden Stop and Recent Recovery

Capital flows to Asia have rebounded strongly since the second half of 2009 after a sharp, but short lived contraction in late 2008–early 2009. The surge in capital inflows has surpassed the very high levels before the crisis in some countries.

<Figure 1> Net Capital Flows to Asia (in billions of USD)



1/ Emerging Asia consist of India, Indonesia, Korea, Malaysia, Philippines and Thailand. Financial centers include Hong Kong SAR and Singapore. Sum of capital flows across countries is shown; no netting is done for intra-region flows. Year-to-date data for China.

Source: IMF(2010)

Portfolio inflows have dominated the recovery, particularly flows into local debt markets. While the size of net capital flows to the region as a whole is still smaller than the size of flows during 2007 —when capital inflows hit record highs— the

¹ For more on recent experiences, please see : IMF(2010), “Managing Capital Flows: Recent Experiences in Selected Asian Countries, 2010.11

composition of flows has been skewed toward portfolio flows. In particular, debt portfolio flows have been strong, especially to Korea, Indonesia and Malaysia.

Equity flows also have been strong, both in terms of magnitude and persistence. While in previous episodes the speed and magnitude of the inflow was comparable, those episodes were far less persistent than the current episode. The Europe-related turbulence led to a retrenchment in equity flows to emerging markets. The retrenchment was short lived in Asia but more pronounced in Latin America and 'Emerging Asia'. This is consistent with the view that Asia's exposure to global financial stress is relatively low.

Flows to Emerging Asia have not been confined to portfolio flows, as corporate issuance denominated in dollars has been above historic highs as well. Cross-border bank exposures to Asia have begun to recover after a sharp fall during the crisis, and foreign direct investment flows have recovered.

Direct financial spillovers to Asia from the European sovereign crisis have been limited so far. Banks and other financial institutions in Japan and other Asian financial centers have only minor exposures to southern European sovereign and corporate debt. Banks in the region are generally less reliant on cross-border and wholesale funding, and have generally maintained their credit-worthiness in the aftermath of the Lehman crisis.

While cross-currency swap bases widened in May 2010 and the tenor of available swaps shortened, the reintroduction of central bank swap arrangements with the U.S. Federal Reserve and the strong policy response in Europe helped assuage market concerns, facilitating the easing of cross-border funding conditions and a quick resumption of capital flows.

A more favorable outlook for growth relative to the advanced countries will likely lead to a prolonged period of high capital flows to Asia. These inflows will be driven both by cyclical and structural factors. Interest rates in the advanced countries will likely remain low for a prolonged period and sustain flows to emerging markets, provided global financial market conditions remain relatively stable. Structurally, the higher medium-term growth prospects for the region, stronger policy fundamentals (including sound fiscal positions) and expanding local capital markets are leading fund managers and institutions to increase their Asian emerging market allocations. Given the long lead time required to change investment mandates and benchmarks, and the limited supply of assets available to foreign investors, this portfolio shift could take years to implement, implying persistent flows to the region. In light of the still limited size of emerging economies' asset markets in relation to advanced markets, even small portfolio shifts may result in significant effects on emerging economies and markets. However, notwithstanding this structural shift, capital flows are still likely to go through boom-bust cycles and their volatility could increase over time.

2. The Impact of Capital Flows

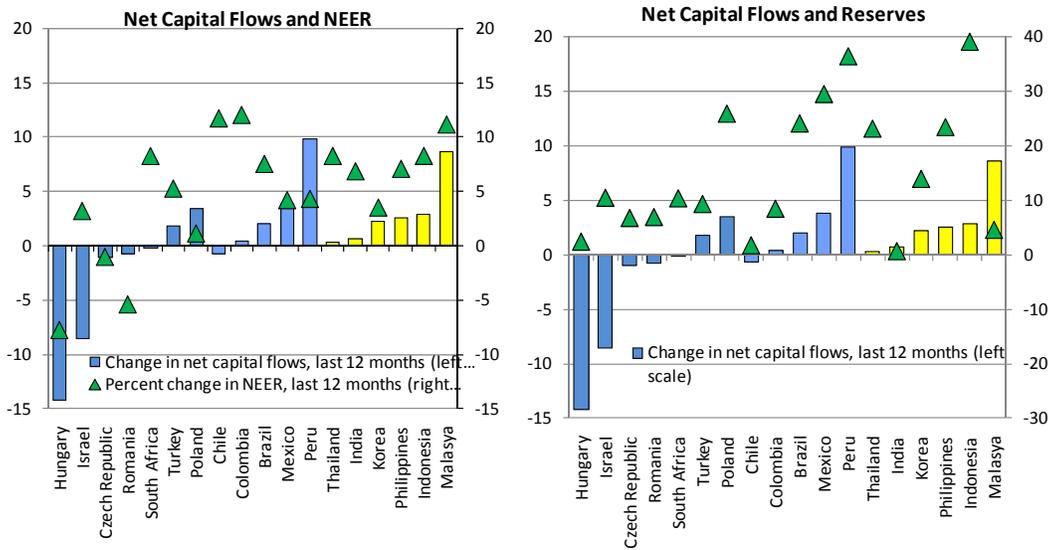
The benefits to an open and liberalized capital market for an emerging economy for growth, financial sector development and job creation are well known. However, sudden surges of incoming capital can distort financial conditions leading to asset bubbles and overheating of the real economy, as well as building up vulnerabilities to a sharp reversal of capital flows and the associated economic costs of the resulting liquidity crisis.

So far the recovery in capital flows has not contributed to macroeconomic imbalances. The pace of credit expansion declined significantly after the crisis, but it appears to have bottomed out. Credit growth picked up earlier in India, the Philippines and Thailand, and has now gained momentum in Indonesia as well, with mortgage loans also growing rapidly in Singapore and Malaysia.

There are a few reasons that explain why credit growth has so far been relatively subdued. First, as noted earlier, the pickup in capital flows has been sustained by portfolio flows, with relatively moderate bank flows. Second, the previous episode of large capital inflows suggests that the credit cycle may lag capital inflows by a few quarters, implying that we may still be at the early stages of the capital flows-credit cycle. Finally, cyclical factors – domestic and global – may be limiting the risk of a near term credit boom. These include abundant cash reserves held by large corporates, weak credit demand by SMEs, and the prudent behavior of banks, which are still choosing to remain liquid given the persistent uncertainty about the global outlook.

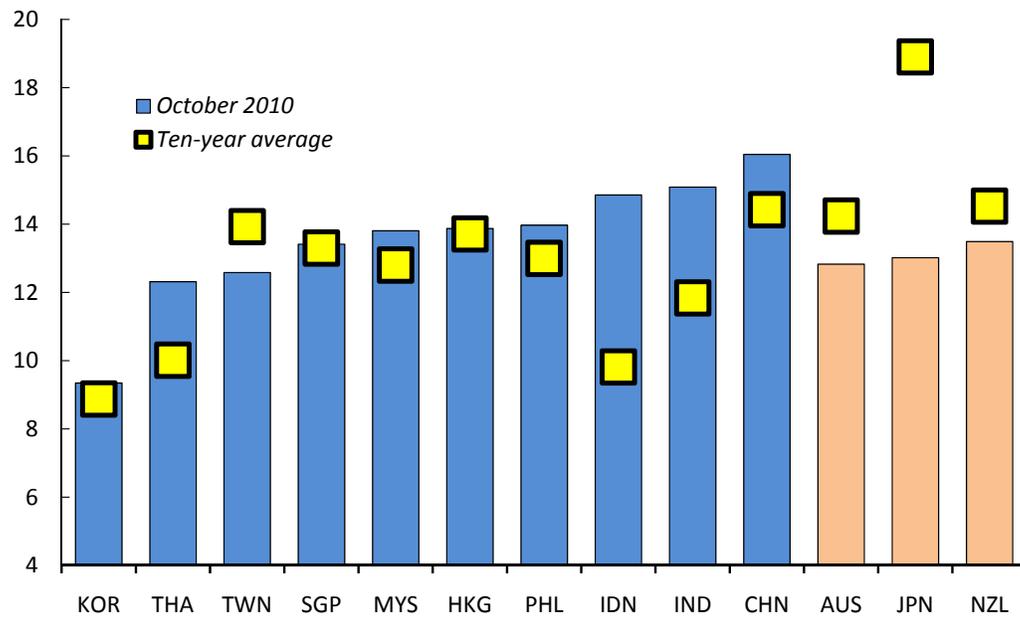
The surge in capital inflows has also not yet led to economy-wide asset price bubbles, although sectors may be experiencing appreciation pressures. Average equity price-earnings ratios for most countries in the region are still below historical levels. However, capital flows in recent months have targeted in some cases specific property markets leading to rapid price appreciation. An area where concern persists is the growing demand for local currency investments, which may eventually lead to substantial underpricing of risk across the region, given that in many cases local currency markets remain underdeveloped and shallow. The challenge, and the appropriate response, over the medium term will be to deepen domestic capital markets and increase foreign investors' access to local markets.

<Figure 2> Change in Net Capital Flows, Exchange Rate Appreciation, and Reserve Accumulation



Source: IMF(2010)

<Figure 3> Twelve-Month Forward Price-Earnings Ratios



Source: IMF(2010)

III. Prudential Measures to Manage Capital Flows

1. Volatile capital flows and financial crises

Since the 1990s, cross-border capital flows have increased due to the globalization of financial markets, with massive amounts of global capital being channeled into emerging markets as their economies grew fast and their capital market became more open and liberalized.

From 1995 to 2007, a total of \$4.1 trillion was invested in the stock markets of emerging economies, making up nearly 30% of international investment capital accounts, a huge increase from the 10% figure during the 1980s (Bank of Korea, Apr. 2010)

Of the various categories of capital flows, those associated with increases in banks' borrowing deserve special attention due to the potential amplifications associated with the leveraging and de-leveraging dynamics of bank balance sheets. In this respect, there are close conceptual links between the issue of mitigating volatile capital flows and the regulatory reform of the banking sector.

Ultimately, the concern is with the real economy. If massive capital inflows are followed by sudden capital outflows, this can create a severe foreign exchange and financial crisis and trigger a slump in the real economy, causing a significant loss in GDP.

As we have seen in the Mexican crisis (1994), the Asian financial crisis (1997), and the recent global financial crisis of 2007-2008, sudden capital outflows from emerging market economies have contributed to the recent crises.

<Table 1> Economic impact of recent financial crises (Bank of Korea, 2009)

	Asian Financial Crisis (4 countries)	Russia Moratorium, LTCM Crisis (6 countries)	Subprime Mortgage Crisis (8 countries)
Change in real exchange rate (%)	□45.5	□21.2	□20.1
Change in foreign reserves (%)	□40.0	□33.6	□16.3
GDP growth (%)	□7.7	□3.0	□2.7

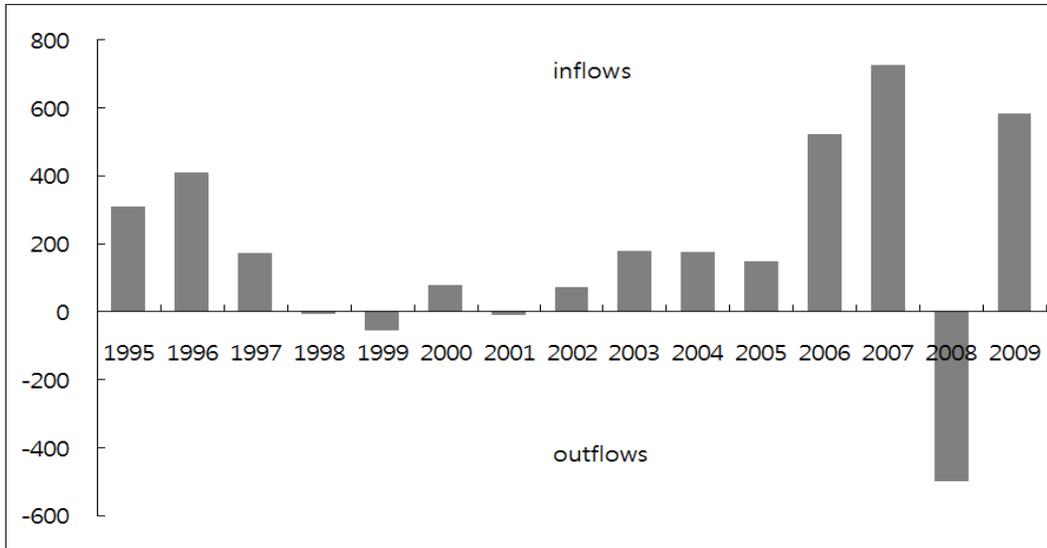
Since the Asian financial crisis in 1997-8, emerging market economies have made genuine efforts to implement crisis prevention policies, opening up their capital markets and strengthening prudential regulation of the financial sector. However, when the global financial crisis began to unfold in September 2008, the liquidity crisis that originated in advanced economies rapidly spread to the rest of the world due to global deleveraging and cross-border contagion. This resulted in very sudden capital outflows from emerging market economies at the same time.

Korea is no exception. Like many other emerging countries, it is a small open economy with heavy external dependence and thus exhibits high volatility in capital flows. From 2002 to 2008, global capital kept pouring into Korea, but in the second half of 2008, the country experienced a severe shortage of foreign exchange liquidity due to an abrupt capital flight.

It is estimated that the 1997 Asian financial crisis resulted in a loss of 180 trillion won in GDP during the five years from 1998 to 2002 (Korea Institute of Finance, Dec. 2009).

<Figure 4> Foreign portfolio investment in Korea and foreign exchange borrowings

(1995-2009, billion dollars)

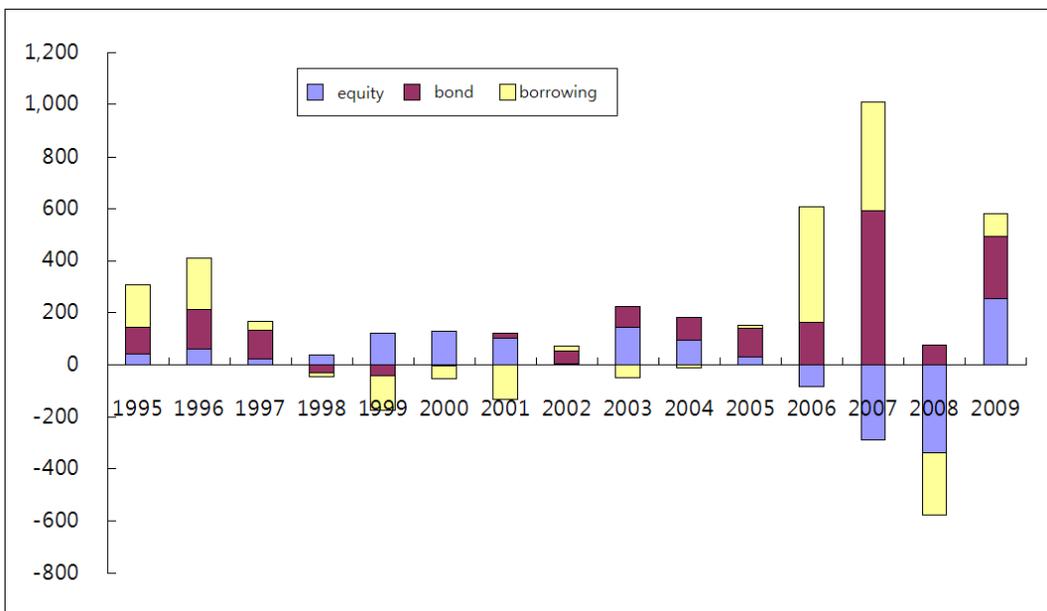


In particular, volatility in banks' external borrowing began to magnify prior to the onset of the crisis, in 2006.

<Figure 5>

Capital flows to and from Korea

(1995-2009, billion dollars)



2. Emerging economies' responses to financial crises

The types of flows that have raised concerns during the crisis vary across countries and markets, ranging from bank flows to portfolio inflows, but measures used by the authorities across countries are each designed to limit identified vulnerabilities in domestic asset markets in a way that cannot be achieved with conventional macroeconomic policy. Prudential measures have been instated to bolster both the resilience of financial markets to abrupt shifts in capital flows and in some cases to deter further inflows to the system, but there does not appear to be a generalized concern about the level of inflows. Thus, these measures can be seen as being complimentary to—rather than a substitute to—a more conventional macroeconomic response.

Four economic factors are relevant in deciding when unconventional measures may be needed in response to a surge in capital inflows: exchange rate valuation, reserve adequacy, the risk of overheating, and stance of fiscal policy. Unconventional measures (such as some macro-prudential regulations and/or controls on capital inflows) have a clearer case where the exchange rate is not undervalued, reserve build-up is not needed, the economy is at risk of overheating (where the inflation outlook is not benign or there is an incipient credit or asset price boom), and fiscal tightening is not desirable or feasible. In these cases, unconventional measures should be seen as a temporary countercyclical policy response.

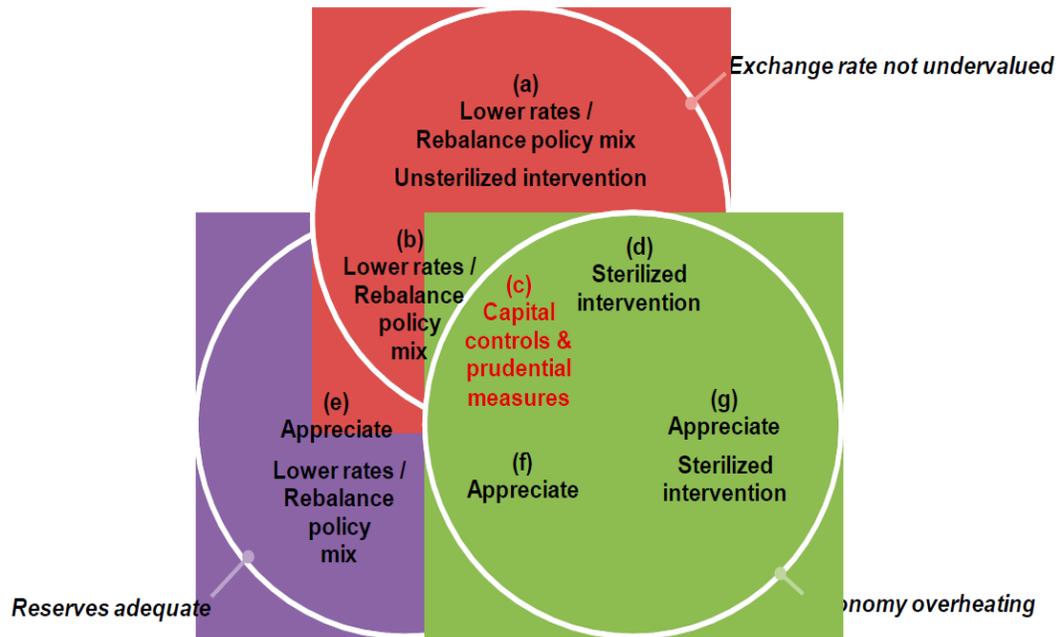
<Table 2>

Measures to Manage Capital Flow Volatility

Policy Tool	Recent Country Examples	Motivation/Objective
Limits to direct and indirect FX exposure	Korea (June 2010): caps FX forward positions of banks relative to their equity capital. Restricts corporate FX hedging to 100% of export receipts.	Derivatives limits indirectly target reduction in external borrowing.
Increase restrictions on external borrowing	India (December 2009): Re-instated interest rate cap on eligible external commercial borrowing that was eliminated during the crisis.	To limit access to foreign credit to best corporate credits and prevent high cost borrowing.
Minimum holding period on central bank bills	Indonesia (June 2010): One month holding period instated for both domestic and foreign investors	To limit volatility of flows. Central bank bills had been subject to sharp shifts in positions relative to global risk appetite, as they were used as a carry trade vehicle. Holding period limits the volatility of flows on exit from positions.
Limited foreign access to central bank instruments	Peru : (2010) Increased fee on foreign purchases of central bank liquidity draining instruments to 400 basis points, and (2009) banned foreign purchases of central bank bills. Also (2009) increased reserve requirements all deposits, with those on local currency deposits held by foreigners hiked to 120 percent. Increased the reserve requirement on other foreign liabilities with maturity less than 2 years to 75 percent.	To reduce inflows and limit credit growth. Central bank CDs, largely used to sterilize FX intervention, were a favored vehicle for carry trades.
Other bans on foreign access	Taiwan POC (Nov. 2009): Financial Supervisory Commission barred access to time deposit accounts for foreign investors.	To dampen speculative flows. Time deposits are one avenue for carry trades/ currency speculation.
Tax on portfolio inflows	Brazil (Oct. 2009): Imposed 2 percent tax on portfolio inflows	To slow inflows. Some studies show that these types of controls might serve to lengthen maturity of inflows, but such effects may be due to misreporting of inflows.
Real estate market measures	<p>Hong Kong SAR (Aug. 2010): Mortgages for luxury property capped at 60 percent LTV ratio. Max. loan amt for non-luxury property capped at US\$0.9 million. Stamp duty on sales increased in April 2010.</p> <p>Korea (2009): Ceiling on LTV ratios lowered in Seoul.</p> <p>Singapore (September 2009, Feb, and August 2010): Min. holding period on private residential property raised to 3 years. Cap on LTV ratio for mortgage lending lowered for second homes. Interest-only loans banned.</p> <p>India (Oct 2009): Increase in provisioning requirements for real estate credit. (Jan, Mar, April 2010) incrementally increased required reserves for banks.</p> <p>China (2010): Taxes on resale of properties within five years increased. Lowered LTV ratios for 2nd or 3rd homes, raised down payments requirements. Mandated increase in mortgage rates for second homes. Property tax being considered.</p>	<p>To maintain banking stability and enhance banks' risk management on mortgage lending to high-end residential properties as well as to ensure a healthy and stable development of the property market.</p> <p>To dampen real estate prices.</p> <p>Series of incremental measures target residential property speculation amid signs of overheating.</p> <p>To address potential risks in banking sector from recovery of credit growth.</p> <p>To lessen speculative activity by lowering transaction volumes and leveling off prices.</p>

Sources: IMF, *Asia and Pacific Regional Economics Outlook*, Spring 2010, and IMF, *Global Financial Stability Report*, Spring 2010.

<Figure 6> Cases of Macro Policy Response to Capital Inflows



Note: Each circle represents cases where the relevant condition is met.

Source: IMF(2010), "Managing Capital Flows."

Emerging market countries have thus far responded to sudden capital outflows in the following four ways: 1) exchange appreciation, 2) stockpiling of reserves, 3) capital controls, and 4) prudential regulation on foreign exchange transactions of the banking sector.

1) Currency appreciation

Most country authorities have accommodated these flows by relying on a mix of currency appreciation and reserve accumulation, with a strong emphasis on the latter on a regional basis. Currencies across the region depreciated significantly in the aftermath of Lehman's collapse but have bounced back, often rapidly, with the onset of the recoveries and the stabilization of global financial markets.

2) Stockpiling of reserves

In the aftermath of the Asian Financial Crisis, emerging market economies have recognized the self-insurance role of foreign reserves in meeting the potential dangers of sudden capital outflows and the subsequent economic crisis.

The reserves fell sharply in most countries as central banks used reserves and, in some cases, changes in their forward position to buffer the shock originating from the sudden drying up of FX funding, but have recovered quickly as the authorities stepped up their foreign exchange rate intervention following the resumption of capital flows.

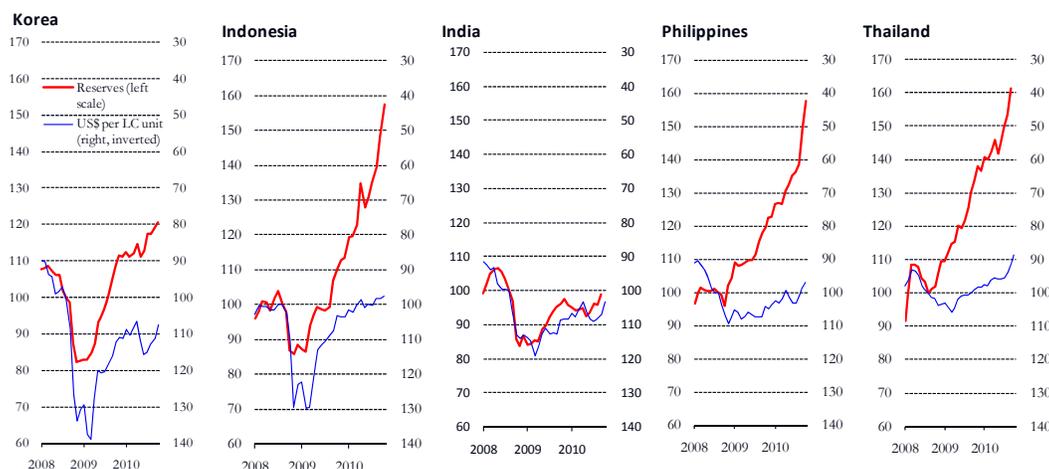
Accordingly, official global foreign reserves have expanded significantly from \$1 trillion (in 1990) to \$6.9 trillion (in 2008), with the bulk of this increase being driven by emerging and developing economies. As of end-2008, such countries account for 64% of global reserves, or \$6.9 trillion, with 34% in the Asian region.

In light of the global financial crisis, the Asian Development Bank found that large reserves across emerging Asia proved very useful in stabilizing currency and financial markets in the face of sudden capital outflows (ADB “Asia Capital Markets Monitor”, May 2010). If all countries compete with each other to accumulate large amounts of reserves, however, they run the risk of worsening global imbalances and giving rise to new mercantilist policies such as protectionist trade and competitive currency depreciation.

The mix of reserve accumulation and exchange rate appreciation has reflected the authorities’ assessment of domestic conditions in addition to the strength of capital flows: cross-country evidence based on a sample of EMs that include countries from

other regions shows that the mix between reserve accumulation and exchange rate appreciation is only loosely related to the strength of the capital flow surges

<Figure 7> International reserves and Exchange rates (Aug 2008=100)



Source: IMF(2010)

3) Capital inflows controls

Recently the IMF has discussed the potential policy role of controls on capital inflows when the macroeconomic policy objectives cannot be met through more conventional macroeconomic or regulatory tools. In its Global Financial Stability Report (April 2010), the IMF took note that countries with tight capital controls recorded relatively small losses in GDP during the global financial crisis.

Yet the report also noted that capital controls do not have an effect on the volume of total inflows, and that even if they can be useful in reducing short-term loans, “controls tend to lose effectiveness over time, as market participants find ways to circumvent them.” These findings are broadly consistent with recent economic research.

After tightening capital controls, a number of Latin American and Asian countries

experienced side effects, such as a decline in sovereign credit ratings and market turmoil due to increased regulatory risk. In addition, for small open economies with high external dependence and open capital markets, it is not easy to apply capital controls due to the stigma attached to them. Furthermore, capital controls may hamper the overall flow of international capital, preventing the rebalancing of global demand and thus hindering global recovery and growth.

4) Prudential regulation in the banking sector

Many emerging market countries have been placing prudential regulation in the banking sector. The most common measures include: i) ceilings on foreign exchange positions; ii) foreign debt-to-asset ratio caps; and iii) restrictions on foreign currency loan.

Since financial institutions serve as channels for capital inflows and outflows, sudden capital outflows have a significant effect on the soundness of individual financial institutions, and this can spread through the entire financial system from a contagion effect.

To prevent the spread or contagion of possible crises, prudential regulation has been implemented by calling for greater capital for individual institutions and more effective risk management.

In the aftermath of the recent global financial crisis, such efforts by emerging market economies have contributed greatly to bringing down individual financial institutions' and businesses' foreign exchange risk. However, as evidenced by recent financial crises, such improvements at the individual firm level were not fully effective in guarding against liquidity crises at the macro, country level.

Although individual institutions' foreign exchange positions were sound, macroeconomic foreign exchange soundness nevertheless deteriorated, such as foreign debt structure and overall liquidity risk across the financial system.

3. Korea's Macroprudential Policy Responses to Capital Flows

In this section we focus on Korea's experience, but it may shed light on other economies in Asia facing similar policy challenges in a scenario of protracted capital inflows.

In June 2010, the Korean authorities announced a package they characterized as "new macroprudential measures to mitigate volatility of capital flows." The stated goal of the measures was to reduce volatility arising from shifts in banks' access to short-term external funding sources.

The announced measures include ceilings on foreign exchange derivatives positions of banks, tighter restrictions on the provision of FX-denominated bank loans, and stricter liquidity ratios requiring domestic banks to raise the ratio of long-term financing for FX loans to 100 percent (from 90 percent). More recently, the Korean government announced that "Macroprudential Stability Levy" will also be introduced later in 2011. Exposure of the public sector to foreign capital inflows through portfolio investments appears to be less of a concern and these flows remain unrestricted.

These measures are prudential and intended to reduce capital flow volatility within the current framework of an open capital account. The measures reflect concern about vulnerabilities associated with external borrowing by the private sector, particularly banks.

A build up of external borrowing before the crisis was associated with carry trades onshore, including through “over hedging” of dollar receivables by Korean exporters. The recent measures are designed to stem the volatility in external financing flows, by addressing two major sources of demand for these flows: banks’ overseas borrowing to fund the hedging contracts they provide to Korean corporations or to take carry trades onshore.

1) New Ceilings on FX Derivatives Positions

a) Background

In Korea, there is strong demand from exporters, particularly shipbuilders, to hedge future export receipts by selling dollars forward and buying Korean won, often over a five-year horizon. Prior to the financial crisis Korean corporations engaged in “overhedging,” selling dollars and buying won forward in expectation of won appreciation and earning the interest differential. Onshore banks provide this hedge for their customers by taking the opposite position, buying dollars forward and selling Korean won forward. Buying dollars forward through an FX forward contract entails lending dollars and borrowing Korean won for the term of the forward. In pricing the forward contract, the party buying dollars forward earns the U.S. dollar interest rate and pays the Korean won interest rate. The U.S. dollar interest rate earned in Korea will be somewhat higher than the LIBOR rate because of a variety of factors, including the supply of dollars onshore in Korea, which is based on the willingness and the ability of banks to engage in these transactions.

According to offshore market participants at major banks, foreign bank branches are the dominant providers of these hedging needs. To fund these positions, foreign bank branches in Korea often borrow dollars from their parent banks offshore. This

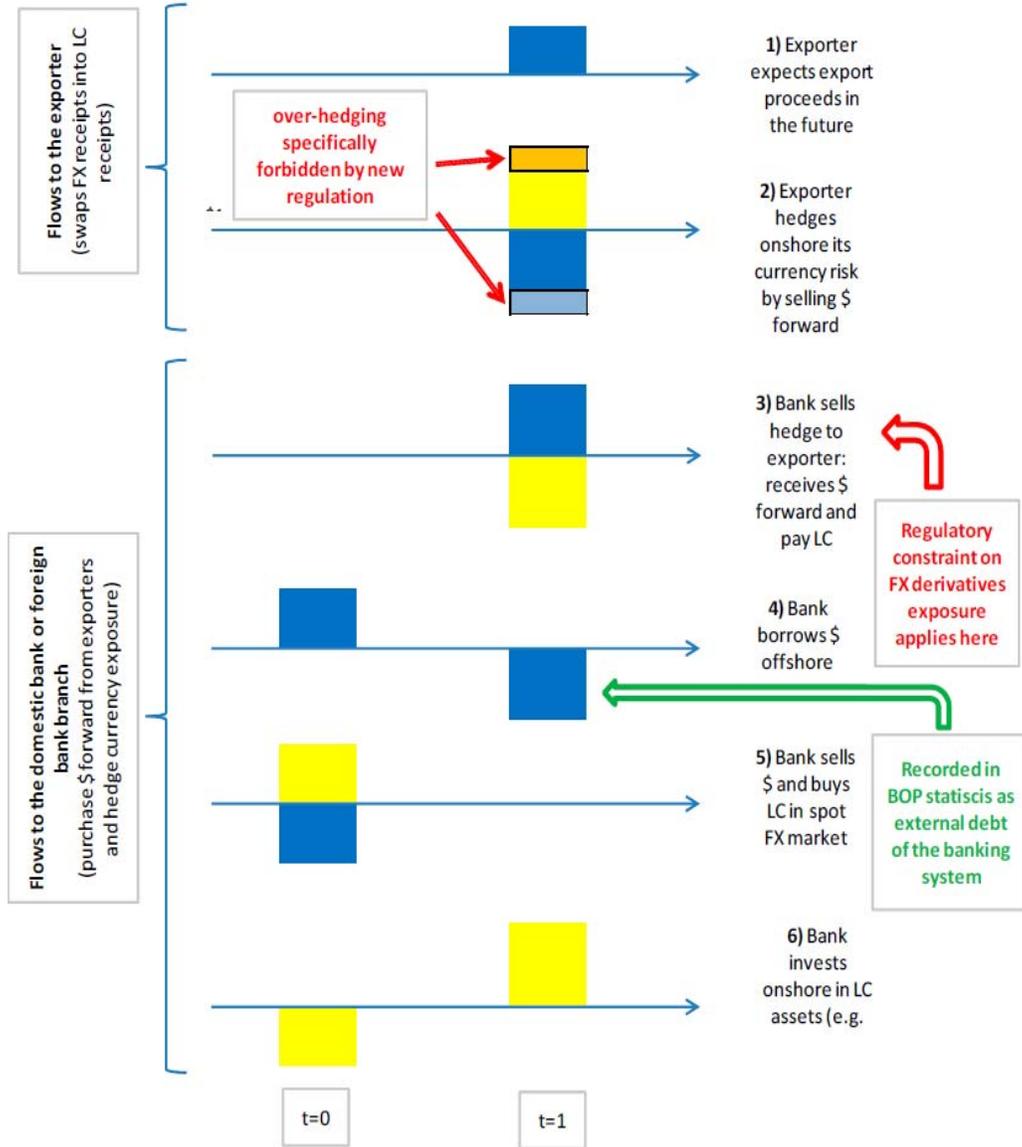
borrowing appears in Korea's balance of payments as external borrowing of the private sector. They then exchange these dollars for won in the spot market and invest in Korean won interest rate products onshore (offsetting the won interest rate they are paying to their customer in the forward transactions). The local bank branch earns the difference between the U.S. dollar lending rate they earn onshore minus the dollar borrowing cost they pay offshore. During the worst of the global financial crisis there was a shortage of dollars onshore and an increase in dollar borrowing costs onshore, due to the contraction of dollar funding globally. This shortage was addressed in part through central bank dollar swaps provided by the Fed, including to Korea.

Similar in concept, a market participant can earn the difference between the interest rates implied by an NDF contract and onshore forward contracts. For instance, in periods of global risk appetite, there can be excess demand for carry trades taken through NDF contracts offshore. When this occurs, the Korean interest rate implied by NDF contracts can become depressed relative to rates seen in onshore interest rate products. A market participant with access to both markets (through counterparty relationships and credit standing both onshore and offshore) may then choose to borrow Korean won (and lend dollars) through an NDF contract and then lend Korean won (and borrow dollars) through onshore forwards. In this case the market participant is FX hedged, but earns the difference between onshore and offshore interest rates. These arbitrage trades bring these rates closer together and provide liquidity in both markets, but in this example they bring appreciation pressures on the Korean won from the NDF market into the actual spot market, which could be of concern to the authorities.

Market participants also engage in "pure carry trades" -- borrowing dollars offshore (or sometimes other low interest rate currencies) to exchange for won and investing in won interest rate products, such as government bills or bonds. In this transaction the entity earns the difference between the won interest rate minus the dollar interest rate, and has

<Figure 8>

On-shore FX Hedging by Exporters



Note: The horizontal line denotes the time line. Rectangles above (below) the line denote positive (negative) cash flows; rectangles in blue denote payoffs in USD and local currency, respectively.

Source: IMF(2010)

an open FX exposure—gaining if the dollar depreciates and losing if the dollar appreciates against the won.

According to the authorities' press release, FX derivatives trading (including FX forward, FX swap, cross currency interest rate swaps, and NDFs) between banks and enterprises, shipbuilders or asset management companies, led to the increase in short-term external borrowing, which was one of the main factors behind the surge in short-term external debt in 2006–07. They note that, “about half of the increase in total external debt of US\$195 billion in the same period was attributed to the increase in FX forwards purchased by banks.”

b) Implementation

FX derivatives trading (including FX forward, FX swap, cross currency interest rate swap (CCIRS), non-deliverable forward (NDF), etc.) between banks and enterprises, shipbuilders or asset management companies, led to the increase in short-term overseas borrowings, which was one of the main factors behind the surge in short-term external debt in 2006~2007. In detail, the rise in banks' buying FX forward was USD92 billion in 2006~2007, which accounted for about a half of the increase in total external debt of USD195 billion during the same period. However, under the current rules banks can buy FX derivatives contracts without any limitations.

Thus, the government sets new limits on FX derivatives contracts relative to the capital of domestic banks and branches of foreign banks. The ceilings on domestic banks' FX derivatives contracts will be no more than 50% of their capital in the previous month. In case of foreign bank branches, the ceilings will be set at 250% of their capital in the previous month, given that their current level is around 300%.

The new restriction implemented in a flexible way. First, the ceilings are adjusted on a quarterly basis depending on the future economic conditions, market situation, and the impact on the business activities, etc. Second, the measures come into effect with a three-month grace period considering the burden of banks to decrease FX derivatives positions at once. Furthermore, the principle of “grandfathering” is considered: For example, in case the existing FX derivatives position is more than the positions of the New Ceilings, the banks can maintain their existing positions of FX derivatives for maximum two years.

c) Bank and corporate reactions

First, foreign bank branches, for which the new regulations are most likely to be binding, could increase their capital base.

Second, banks could also decrease the amount of FX forward positions offered to customers, and limit their foreign borrowing. As these foreign bank branches are intermediating offshore versus onshore dollar borrowing needs, when this activity is restricted the result could be higher onshore dollar borrowing costs, which would also mean higher FX hedging costs for exporters. In the event of another global dollar funding squeeze there may be less severe dislocations in Korean onshore markets as the volume of dollar borrowing being rolled over in association with the provision of hedging contracts to customers might be smaller. However, dollar funding squeezes could be more frequent, as there would be less scope for banks to take advantage of sharp increases in onshore dollar lending rates versus their own offshore dollar funding costs.

Third, Korean exporters could engage in FX hedging through NDFs with major banks offshore, if these contracts imply much lower dollar borrowing costs than what is available onshore after the measures are in force. While this might occur on the margin, it is unlikely to be used extensively, because only a few large Korean corporates, primarily those with external debt issues (and an associated CDS market), would be able to obtain counterparty relationships with major banks offshore.²⁷ In addition, the NDFs would not be a perfect hedge for actual dollar receipts since the spot rate the corporate is able to obtain when actually converting the export receipts may not exactly match the NDF “fixing,” making the NDFs an imperfect hedge compared to outright forwards.

Fourth, Korean corporations could also engage in outright FX forwards with offshore banks. Offshore banks would need to fund in dollars offshore, exchange the dollars for won in the spot market, and buy Korean won government bills or bonds, and then at maturity sell the government note position, deliver won to the corporate, and take delivery of the dollars, which would then be repatriated.²⁹ Similar to hedging through NDFs (noted above), foreign banks offshore may be reluctant to build up large counterparty exposures through forwards to any but the strongest Korean corporations.

The impact of the measures on pricing in spot and forward markets has been limited.

The reduction in the FX derivatives position estimated for foreign branches is relatively small, compared to the stock of outstanding. There is evidence that foreign bank branches have already reduced their FX forward positions ahead of the phase in of enforcement.

According to Morgan Stanley estimates (June 14, 2010), US\$18.7 billion of FX forward positions will need to be rolled off, 97 percent of which are held by foreign banks. JP Morgan estimates (June 10, 2010) that the amount of FX forward positions that will

need to be unwound could be from US\$25 to US\$5 billion, based on an estimate of the maximum allowable position for foreign banks of US\$35 billion (with current levels of capital) and the amount outstanding in FX forward positions of forward bank branches onshore of US\$40–60 billion. In September, Korean authorities indicated that in anticipation of the enforcement of the measure in October, between July and August 2010, foreign bank branches had already reduced FX forward positions by \$11.9 billion, and accordingly their short-term external debt declined by US\$8.7 billion.

Some market participants noted concern over authorities' statement that this measure will be "reviewed" on a quarterly basis. This increases regulatory uncertainty and, with some banks fearing that the limit on foreign bank branch positions will be reduced closer to the level of domestic banks. In addition, the measures do not prevent the continuation of carry trades and the build-up of external borrowing, at least by the public sector. Foreign banks based in Singapore can continue to fund in dollars, exchange dollars for won in the spot market, and invest in local Korean won bills and bonds, taking an open position. They could also continue to arbitrage onshore versus offshore dollar borrowing costs by overlaying this position with NDF contracts.

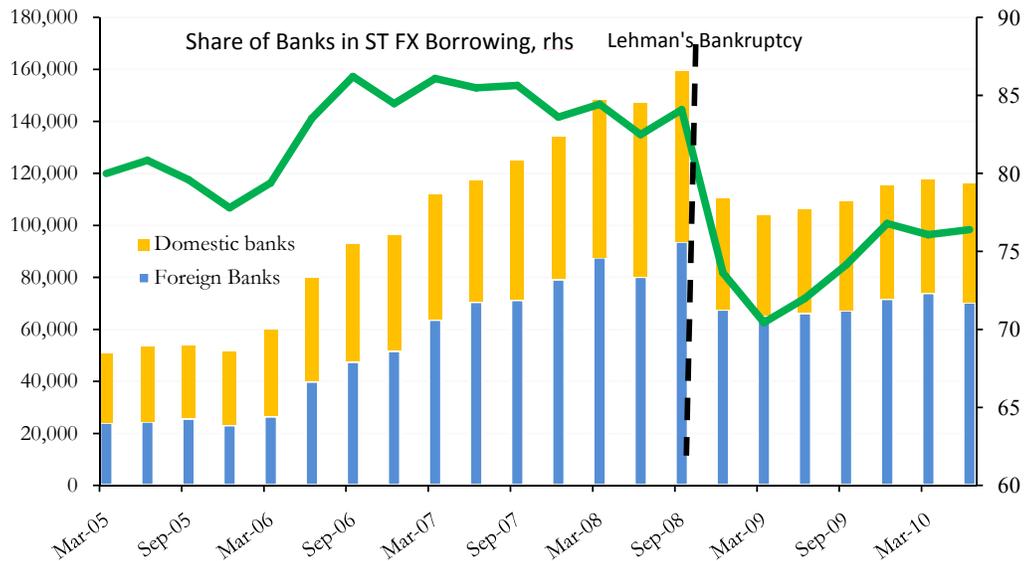
While the authorities noted that some of the hedging-related transactions may move offshore, they suggested that additional costs may discourage corporates. They also recognized that these measures would not have much impact on overall capital flows in and out of Korea's liquid equity and bond markets. They agreed with IMF staff that a flexible exchange rate and a sound financial sector are the best defense against capital flow reversals.²

² International Monetary Fund, Republic of Korea: 2010 Article IV Consultation Staff Report, paragraph 40.

Overall, the measures are likely to moderately reduce, or at least stem a potential increase in, the amount of external debt of the banking sector onshore in Korea. The measures might also cap the external debt held by the wider private sector, depending on how easily Korean corporations find arrangements with offshore entities to substitute for those they had with foreign bank branches onshore.

With fewer entities able to intermediate onshore versus offshore dollar borrowing costs, particularly when large positions are being rolled over, there could be an increase in FX market pricing volatility. The caps may reduce the volatility of flows, but there could be more frequent short-term bouts of price volatility than had occurred previously. However, as there remain a number of avenues for intermediating offshore versus onshore borrowing costs even with these measures in place, a significant reduction in FX market liquidity under normal market conditions is unlikely.

<Figure 9> Effectiveness of measures on banks' external debt



Source: IMF(2010)

2) Withholding tax on interest income from government bonds

Prudential measures to manage portfolio flows focused on restoring the withholding tax on foreigners' (foreign corporations and non-residents) capital gains and interest income from Korean government bonds (KTBs) and monetary stabilization bonds (MSBs). For this, two separate bills to amend the Personal Income Tax Law (PITL) and Corporation Tax Law (CTL) have been submitted to the National Assembly.

Rep. Kim Song Sik and Rep. Kang Ghil Boo respectively submitted bills to the National Assembly on November 12, 2010. Both of the proposed bills require the special tax treatment in article 119-2 of the PITL and article 93-2 of the CTL to be removed (re-imposing the withholding tax). In addition, Rep. Kang's proposal is designed for the government to adjust tax rate depending on financial market conditions. As for the effective date, Rep. Kim's bill is to come into effective at the promulgation of the amendment while Rep. Kang's is on January 1, 2011. Both proposals clarify that the bonds purchased up to November 12, 2010 will not be subject to the withholding tax.

<Table 3>

Amendment Bills

	Proposal by Rep. Kim	Proposal by Rep. Kang
Withholding tax	Special tax treatment (article 119-2 of the PITL, article 93-2 of the CTL) to be removed	Special tax treatment (article 119-2 of the PITL, article 93-2 of the CTL) to be removed
Flexible tax rate	Not available	Withholding tax rate can be lowered up to zero if necessary to urgently stabilize financial markets (e.g. for interest income, the rate varies from 14% to zero)
Effective date	From the day of promulgation	Jan. 1, 2011

The purpose of the bills is to respond to the concerns that excessive capital inflows could threaten economic stability.

The Korean government has the view that restoring the withholding tax is appropriate to mitigate the risk of excessive volatility in capital flows, given the rapid increase in foreign investment in Korean bonds.

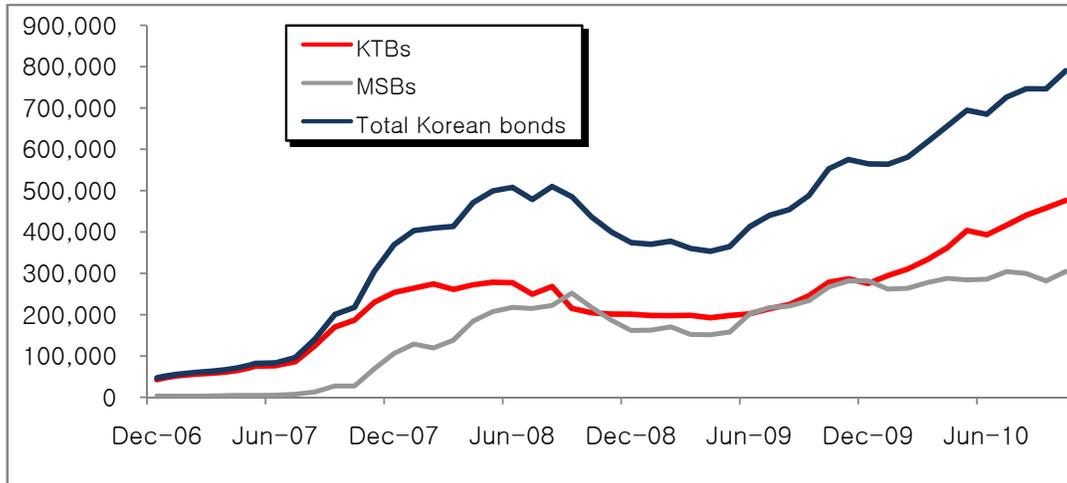
Recently, global excess liquidity posed by Quantitative Easing measures (QE) and the exceptionally low interest rate environment created in the developed economies has led to large capital inflows into Emerging Market economies (EMs). This shift in global liquidity has brought with EMs large swings in capital flows.

Korea, in particular its bond market, is becoming an attractive destination for foreign investors. In the first 10 months of 2010, net investment in Korean bonds stands at KRW 21.1 trillion, which accounts for 55% of net foreign portfolio inflows of KRW 38.4 trillion. As a consequence, foreigners hold 7.1% of outstanding bonds and 14.9% of Korean Treasury Bonds (KTBs) as of the end of October, 2010. There has been a significant increase from 4.3% and 8.4%, respectively, at the end of 2008. The recent trend of the increase in foreign holdings of Korean bonds is expected to continue due to the expansion of global liquidity.

It should be noted that tax benefits to foreign investors have also attributed to the recent surge of capital inflows. In May 2009, Korea abolished a 14% withholding tax on interest income and 20% capital gains earned by foreign investors on KTBs and MSBs. The exemption of such taxes on foreign holdings of KTBs and MSBs would be considered as one of the reasons behind the surge in foreign bond investment.

< Figure 10> A trend of foreign holdings of Korean bonds

(unit: KRW 100 million)



Excessive inflows could make both the bond market and foreign exchange market more volatile. Moreover, a surge of capital inflows could lead to inflation and asset price bubbles, and a possible sudden reversal of such inflows could result in a systemic risk. Therefore, precautionary and preemptive measures are needed to curb excessive foreign capital inflows into the bond market.

Such macro-prudential measure is in line with the agreement reached at the G20 Seoul Summit. The G20 leaders have agreed that policy responses in EMs may also include carefully designed macro-prudential measures in circumstances where countries are facing undue burden of adjustment posed by the risk of excessive volatility in capital flows. In this context, the withholding tax could be a reasonable measure as a “minimum safety net” to avoid potential disruption of financial markets.

3) Macro-prudential Stability Levy

a) Motivations

The Korean government plans to impose Macroprudential Stability Levy on non-deposit foreign currency liabilities with three motivations.

First, the key factor of the past two financial crises in 1997 and 2008 was sudden capital outflows following excessive capital inflows during boom periods. Like many other emerging and developing countries with a small and open economy, Korea is highly vulnerable to extreme changes in the global economy and sudden capital movements. Of the various capital flows, overseas borrowings are the most volatile, in particular short-term ones. The Korean government, which has reinforced macro-prudential measures to reduce capital flow volatility within the framework of an open and liberalized economy, now decided to introduce the levy.

Second, the need to curb massive capital inflows in the form of carry trade into Korea is growing as global liquidity excess has been recently caused by Quantitative Easing measures (QE) and the exceptionally low interest rates in advanced countries. A surge of capital inflows could lead to inflation and asset price bubbles, and a sudden reversal of such inflows could possibly result in a systemic risk. In addition, the levy will be used as to provide liquidity when necessary to help the Korean economy cope with external shocks.

The introduction of the levy is consistent with the global trend, in particular with the communiqué of the G20 Seoul Summit where the leaders have agreed on the need for design and implementation of macro-prudential measures to curb excessive capital flows. Germany, the United Kingdom and France are to impose the financial levy form

January 2011 with aim of repairing the financial system or fund resolution. Against this backdrop, the Korean government plans to adopt the levy as a pre-emptive and precautionary measure.

b) Implementation

The levy will be charged on ‘non-deposit foreign currency liabilities’ appeared in bank balance sheets. The levy on foreign currency liabilities reflects Korea’s systemic risks which have been posed mainly by external factors such as excessive capital flows.

The levy will first apply to banks including domestic banks and foreign bank branches considering that they represent a large portion of the financial sector and high possibility of posing systemic risk, but if needed, the levy will apply to all financial institutions. The levy rate will vary according to debt maturity. Short-term debt will be subject to a higher levy rate compared to long-term debt as short-term debt poses higher risk. The actual levy rate will be determined through consultations with interested parties and public hearings. The levy will be collected in foreign currency to stabilize the financial market including liquidity injection to failing financial institutions in an economic crisis.

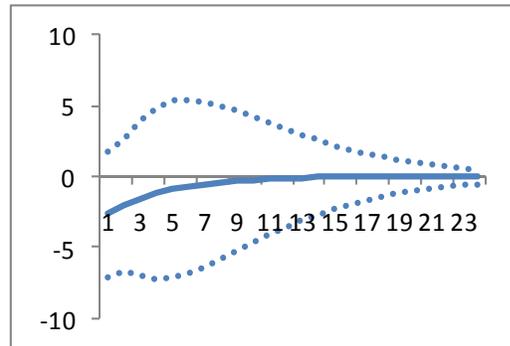
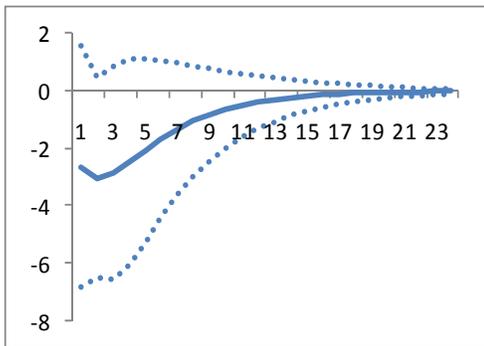
Local news outlets came up with estimates that the rate would be 20 basis points (bps) for short-term debts whose maturity is less than one year, 10 bps for mid-term liabilities and 5 bps for long-term obligations whose maturity is longer than three years. If the related legislations are confirmed in the National Assembly early 2011 as the government expects, it will take effect in the second quarter.

c) Impacts

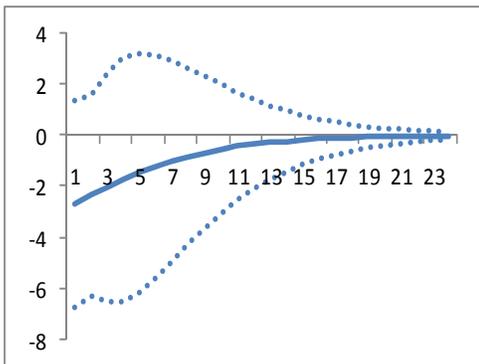
How effective will the macroprudential levy be in reducing the non-deposit foreign currency liabilities of banks? As the levy will have the same effect as that of the rise in funding cost, we can estimate the impacts of the levy using a vector autoregression analysis (VAR) between the level of the non-deposit foreign currency liabilities (fDBT) and their average funding costs (COST). According to a study done by Korea Institute of Finance (2011), a temporary shock of one percentage point increase in the funding cost will lead to a 2.5~4.0% drop in the balance of liability in that period and then gradually recover to the previous level in a year later.

<Figure 11> An impulse response estimation of a one-time macroprudential levy

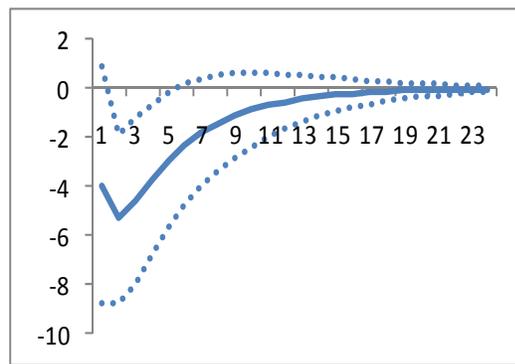
1) Funding cost → fDBT (domestic banks) 2) Funding cost → fDBT (foreign branches)



3) Funding cost → fDBT (short-term)



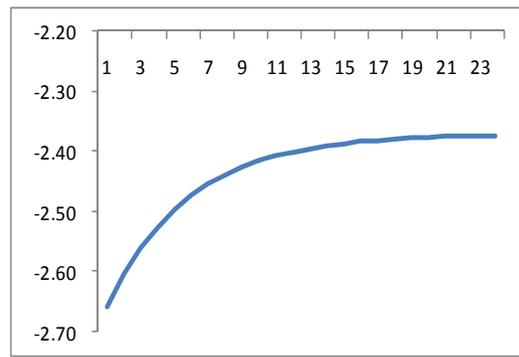
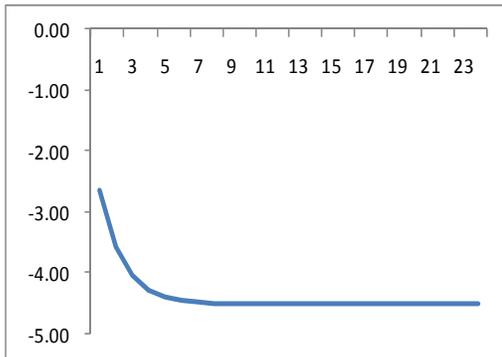
4) Funding cost → fDBT (long-term)



In the case of a permanent shock of one percent increase in the funding cost, the balance of foreign currency liability will decrease by 4.5% at the end of one year period. The impacts, however, differ depending on the duration of the debt and the type of banks, i.e., whether it is a bank or a foreign bank branch; 4.53% for the domestic banks and 2.40% for the foreign bank branches, while 3.55% for short-term debts and 6.72% for long-term debt.

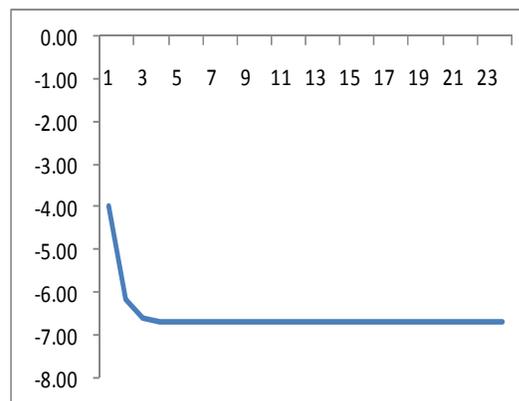
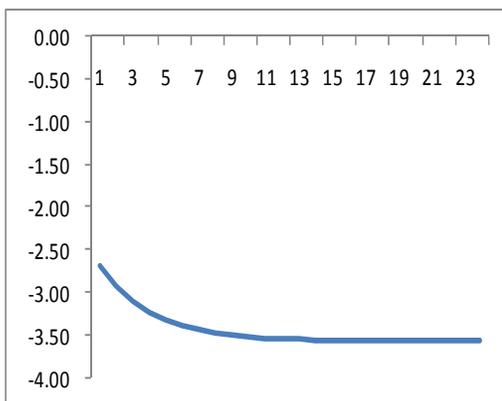
<Figure 12> An impulse response estimation of a permanent macroprudential levy

1) Funding cost → fDBT (domestic banks) 2) Funding cost → fDBT (foreign branches)



3) Funding cost → fDBT (short-term)

4) Funding cost → fDBT (long-term)



Note: months after the levy in the horizontal axis, and percentage change of fDBT in the vertical axis.

Based on the estimated change, we can calculate the impacts of the proposed macroprudential levy, i.e., 20 bps for one-year, 10 bps for 1~3 years, and 5 bps for long-term obligations. <Table 4> summarizes the percentage changes in foreign debts over one year if the macroprudential levy is implemented now.

<Table 4> Impacts of the proposed macroprudential levy on foreign currency liabilities

	Short-term debts (1 year)	Mid-term debts (1~3 years)	Long-term debts (over 3 years)
By types			
Domestic banks	-4.53%	-4.53%	-4.53%
foreign bank branches	-2.37%	-2.37%	-2.37%
By duration			
Domestic banks	-3.57%	-6.72%	-6.72%
foreign bank branches	-3.57%	-6.72%	-6.72%

These changes are equivalent to \$1.7 billion dollar reduction over one year if the levy is applied to the current level of foreign currency liabilities as of October 2010.

<Table 5> Impacts in dollar terms over one year (\$100M)

	Short-term debts (1 year)	Mid-term debts (1~3 years)	Long-term debts (over 3 years)
By types			
Domestic banks	-6.02	-1.48	-2.10
foreign bank branches	-7.36	-0.07	-0.02
Total	-13.38	-1.55	-2.12
By duration			
Domestic banks	-7.57	-0.99	-1.41
foreign bank branches	-9.26	-0.05	-0.01
Total	-16.84	-1.04	-1.42

4. Recent Experiences in Selected ASEAN Countries

In several countries in the region, various prudential measures have been instated to deal with credit growth and overheating, which may be indirectly related to capital flows. A broader survey of selected measures across the region and in other areas is summarized in <Table 2> above. In this section, we focus on two other representative cases in managing problems from large capital inflows: taxing capital inflows rather than the balances of targeted foreign currency liabilities, and restraining the asset price pressures.

1) Indonesia : managing short-term volatility

Brazil is famous for introducing a more broad measure which levies taxes on all capital inflows. In the region, Indonesia's approach to protect its economy from a tide of incoming capital is rather similar to Brazil in the sense that it is targeting capital inflows as a whole, not like Korea which sought for the specific component of inflow, e.g. short-term foreign exchange borrowing.

Indonesia recently has been a darling of emerging market investors. The currency has risen nearly 3.5 per cent and the stock market 40 per cent. According to latest Bank Indonesia data, foreigners have bought net 86.8 trillion rupiah (\$US9.6 billion) worth of Indonesian government bonds and 9.7 trillion rupiah of central bank SBI debt in 2010.

Given high inflationary pressures, Bank Indonesia has started to take liquidity management measures to mop up liquidity and sterilize their foreign exchange intervention.

The type of measures being pursued includes:³

- i. Widening of the overnight interbank money market rate corridor, effective by 17-06-2010;
- ii. Revisions of regulations on banks' FX net open positions (NOP), effective by 01-07-2010;
- iii. Imposing minimum 1 month holding period for Bank Indonesia certificates (SBI) both in primary and secondary markets, effective by 07-07-2010;
- iv. Introduction of term deposits as non-securities monetary instrument, effective by 07-07-2010;
- v. Issuance of the 9 and 12 month SBI, effective by 2nd week of August 2010 (9-month SBI) and 2nd week of September 2010 (12-month SBI); and
- vi. Implementation of the triparty repurchase (repo) of Government debt securities (SBN) in 2011.

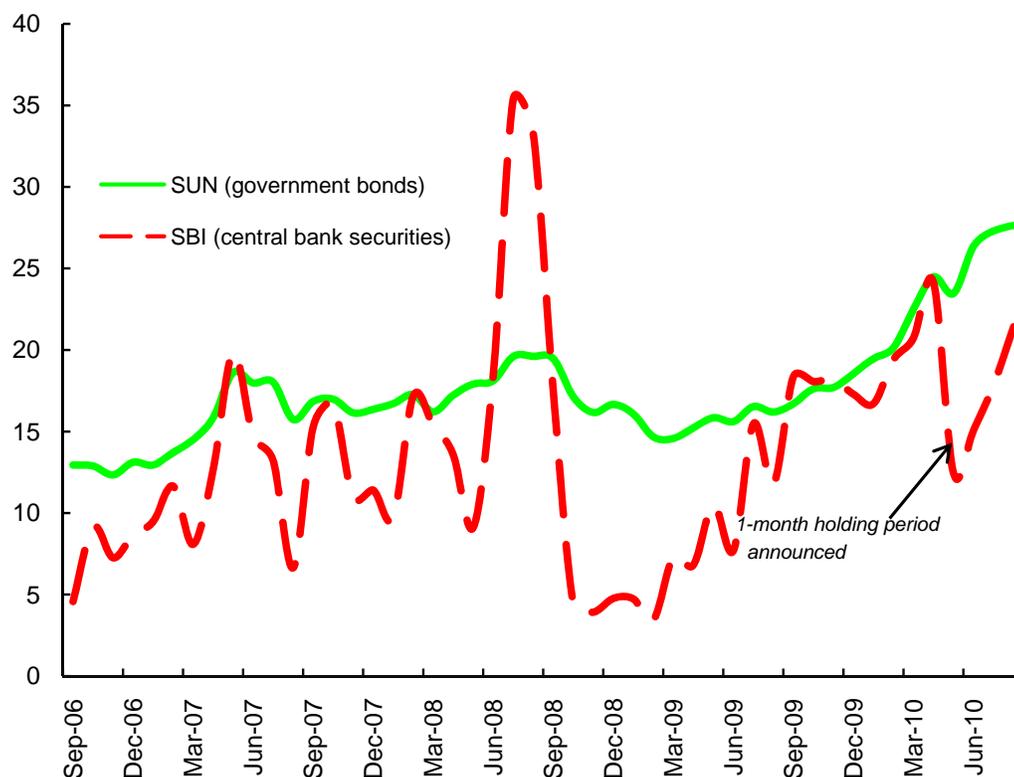
Above all, the 'revisions of regulations on banks' FX NOP' was intended to increase the number of transactions and the depth of the domestic foreign exchange market to support the rupiah exchange rate stability while keeping in consideration bank prudential aspects. The On Balance Sheet NOP limit of maximum 20% of capital is abolished; however, the Overall NOP is still maintained at 20% of capital. The existing real-time compliance on NOP limit is further relaxed into 30 minutes window time.

Meanwhile, the influx of capital inflows, in particular in the form of portfolio investment, must be vigilantly managed and channeled towards longer-dated investments to ensure its benefit to the stability of the rupiah exchange rate, the accessibility of medium to long term domestic financing, and the less short term fluctuation of the capital flows. Otherwise, a change in risk sentiment may trigger a "hot money" reversal, hurting the local currency and financial stability.

³ Bank Indonesia (2010), "Policy Package on Strengthening Monetary Management and Financial Market Development"

So near the end of 2010, Indonesia announced a plan to raise the minimum dollar reserve requirement for commercial banks to five per cent of total deposits from March 1, 2011 and to eight per cent on June 1, 2011 from the current one per cent. A rise to five per cent in dollar reserve requirement – which banks store at the central bank – was expected to absorb \$US1.5-2.5 billion from the market, while the rise to eight per cent could absorb \$US3 billion.

<Figure 13> Share of Foreign Ownership in Total Securities Outstanding (%)



In December 2010, the central bank, the Bank Indonesia, also capped banks' vostro accounts at a maximum 30 per cent of capital beginning end January, with a three-month transition time. Vostro accounts are rupiah deposits in commercial banks held by foreigners and considered a form of short-term borrowing by the institution.

2) Singapore and Honk Kong: restraining asset price pressures

When capital inflows target high end property markets, they also trigger governments' regulatory responses directed at containing asset price pressures. Post crisis, several economies in the region have worked to address vulnerabilities associated with excessive or increasingly risky credit growth, particularly in the property sector. Rather than being specifically directed at capital inflows, these measures have countered overheating pressures that can be exacerbated, directly or indirectly, by capital flows.

Since the crisis, Singapore has implemented a series of incremental measures that are designed to limit excess speculation in target residential property markets amid signs of overheating. The most recent measures were announced in August 2010. They include an increase in the minimum holding period for private residential property to three years from one year, with a higher stamp duty imposed for earlier sales. The LTV limits for buyers with outstanding mortgages were also raised. Market participants expect additional measures will be forthcoming, including lower caps on LTV ratios and higher stamp duties.

Hong Kong SAR required 60 percent cap on LTV ratio for luxury properties (above a specific price limit) and also began to impose higher stamp duties on transactions for luxury property. In China, property price pressures were targeted with greater administrative guidance on financing. For example, down payments for mortgages were increased, there was a mandated increase in mortgage rates for second homes, third mortgages were officially discouraged, and property developers became subject to higher scrutiny of their financing arrangements.

IV. Policy Recommendations

1. Implications from recent experiences

Large capital flows during the recent recovery raise macroeconomic and financial stability concerns similar to what policy makers have faced during previous episodes of large flows. What may be different this time are stronger external drivers -- unusually low policy rates and long term yields in the advanced countries and a substantially weaker growth outlook – which could augur for a structural shift in global asset allocation and a sustained period of large flows.

The composition of external capital flows is also very different this time around. Portfolio investment flows that are intermediated mainly outside the banking system comprise a much larger share of aggregate flows, and a significant proportion is being invested in public and private sector debt securities. Portfolio flows to fixed income markets have closely followed the almost secular decline in advanced country bond yields and have been helped by the very low cost of borrowing in the major currencies. Banking flows have suffered as a result of the crisis and the slow recovery of banks together with the prospect of more stringent regulation and higher capital requirements. Moreover, flows into equity markets have broadly reflected the global economic outlook and equity markets have therefore moved in tandem with developed country equity markets, notwithstanding more recent outperformance of emerging market equity indices.

There are two broad implications of these trends that may have a strong bearing on policy. First, the types of flows that have raised concerns during the crisis vary across countries and markets, ranging from bank flows to portfolio inflows, and measures used

by the authorities across countries are each designed to limit identified vulnerabilities in domestic asset markets in a way that cannot be achieved with conventional macroeconomic policy. Prudential measures have been instated to bolster both the resilience of financial markets to abrupt shifts in capital flows and in some cases to deter further inflows to the system.

Second, as a complement to the conventional macroeconomic policy response, extending the tool kit with the use of macro prudential measures will need to be targeted at specific types of flows and markets so as not to impede all capital flows. The measures adopted in Korea broadly fit this characterization. In Korea, the authorities have essentially tried to limit leverage in the banking system (including in domestic branches of foreign banks) and strengthen the maturity of banks' funding, without in any way trying to limit capital flows to either fixed income or equity markets.

Recent unconventional measures in Korea suggests that these macro prudential measures will be effective in achieving their intended objectives, in part because they are well targeted, but also because there are no strong incentives to circumvent. For investors seeking exposure to assets in these countries, almost all other avenues have been left open.

With regard to the wider, and ongoing debate on the use of macro prudential policy to deal with large (and possibly) volatile capital flows, one lesson is that it is difficult to generalize about the effectiveness of prudential controls or limits on capital flows. Any potential measure has to be assessed in a country specific and market specific context to examine the incentives and the ability of investors to circumvent, and beyond this narrow criteria, whether they are effective in achieving their objectives. In this respect, the ASEAN+3 Research Group needs to actively engage in studying the impact and effectiveness of a wide range of macro prudential measures, including those that are

primarily aimed at preserving domestic financial stability.

2. Effective ways to prevent recurrence of crises in emerging market countries

Emerging countries with open capital markets and large private demand for foreign currency must try to manage the volume of capital inflows in normal times, including banks' external borrowing, to a degree controllable in times of stress.

At the same time, considering the difficulty in choosing the right signals to respond to and the right timing to intervene, it is important to secure built-in stabilizers to cope with sudden capital outflows in times of crisis.

To this end, the following pair of policy initiatives will have to be considered in addition to the policy measures emerging countries have been implementing in response to the crisis.

1) Establishment of a Global Financial Safety Net

As seen in the recent financial crises, cross-border capital flows have made it more likely that problems in a particular region, whether it be problems of private or sovereign debt to spread to the rest of the world very rapidly without respect for borders or for whether a country is an advanced or emerging/developing country. In order to prevent shocks from affecting "innocent bystanders", financial safety nets that can provide emergency funding in extreme cases can secure market confidence in crisis response capabilities.

Although emerging market economies expanded their foreign exchange holdings by more than 6.4 times (from \$0.7 trillion in 2000 to \$4.5 trillion in 2008, according to the

IMF), they still experienced a liquidity shortage during the recent global financial crisis. A global financial safety net is thus needed as a second line of defense for dealing with volatile capital flows, in addition to foreign reserves.

Aside from foreign exchange holdings, other liquidity facilities for emerging countries include currency swap arrangements and the IMF's Flexible Credit Line (FCL) and Precautionary Credit Line (PCL).

Currency swap arrangements have their own limitations in that they are not institutionalized and are thus not reliable. Meanwhile, many countries are still reluctant to use IMF facilities due to the stigma attached to borrowing from the Fund.

As such, the establishment of an effective financial safety net should be pursued with the following three points in mind. First, predictability of access in case of need should be enhanced. It should readily known what conditions will allow access to the safety net and the extent of resources available to dispel uncertainty in times of stress. Second, accessibility should be enhanced to ensure that countries can use the resources reliably and immediately when the need arises. Third, measures should be developed to minimize the potential stigma about using the safety net rooted in the concern that it could send a negative signal to markets.

2) Strengthen surveillance and cooperation

Impossible trinity implies that we can't have i) free capital movement, ii) stable exchange rates, and iii) an independent monetary policy at the same time. As a compromise we often engage in foreign exchange market intervention, whether it is sterilized or unsterilized.

In order to induce strong cooperation in the region in the area of capital account management or exchange rate policy, it is needed to strengthen the regional surveillance function of the ASEAN+3 Macroeconomic and Research Office (AMRO) which will be established in Singapore in early 2011 by the Ministries of Finance, Central Banks and Monetary Authorities of ASEAN countries, China (including Hong Kong, China), Japan and Korea (ASEAN+3 Countries). Among the tasks of AMRO⁴, the task of assessing macroeconomic and financial vulnerabilities in any of the ASEAN+3 Countries and providing assistance in timely formulation of policy recommendations to mitigate such risks is very important in coordinating cooperation in a regional level and it will require many talented workforce and ample resources to support them.

3) Reinforcing prudential regulation on FX transactions of financial institutions

By encouraging individual financial institutions to manage risks associated with foreign currency assets and liabilities, prudential regulation can reduce both the overall volatility of capital flows and the effect of such volatility on the economy.

As banks play a central role in determining a country's capital flows, the volume can be limited by regulating the amount of risk to which banks are exposed. Since the leveraging and de-leveraging by banks play a key role in driving both the capital inflows and the sudden outflows, improved prudential regulation of the banking sector can be expected to play an important role in mitigating the risks from volatile capital flows.

⁴ i) to monitor, assess, and report on the macroeconomic situation and financial soundness of the ASEAN+3 Countries, ii) to assess macroeconomic and financial vulnerabilities in any of the ASEAN+3 Countries and provide assistance in timely formulation of policy recommendations to mitigate such risks, and iii) to ensure compliance of swap requesting parties with the lending covenants under the Chiang Mai Initiative Multilateralisation (CMIM) Agreement.

Until now, emerging countries' prudential regulations on foreign exchange transactions have been focused on reducing foreign exchange and liquidity risk. In addition to these micro measures, however, countries need to add macroprudential measures.

Under the current micro-prudential regulatory regime, even if individual financial institutions implement adequate prudential measures consistent with regulations, systemic risk can arise and spread throughout the entire economy (Increase in individual banks' borrowing → increase in the country's overall external debt → downgrade in sovereign credit rating → sudden foreign currency outflows in times of crisis → economy-wide liquidity shortage).

In this regard, macro-prudential measures need to be developed to sever the abovementioned linkages and reduce systemic risk. A consensus has already been reached within the G20 on the need for strengthening prudential regulation in the banking sector. Currently, G20 members are developing appropriate measures that take into account country-specific economic circumstances and vulnerabilities as part of their efforts to identify and address the causes of the recent financial crisis.

Against this backdrop, other countries, and emerging market economies in particular, should develop and share policy measures that factor in local macroeconomic conditions and vulnerabilities.

For instance, they may consider imposing a bank levy where the base is chosen to include short-term foreign exchange liabilities so that large fluctuations in such liabilities can be dampened. Although the debate on the bank levy has focused on raising revenue so that the financial sector can make a fair contribution towards paying for any burdens associated with government interventions to repair the banking system, a bank levy on foreign exchange liabilities is primarily a prudential tool to improve the

resilience of the financial system. In a similar vein, a cap on the leverage ratio of banks can serve as a way of reducing the vulnerability of the financial sector.

Additionally, within the broad framework of maintaining open and liberalized capital markets, Korea is planning to introduce measures able to keep private sector's demand for foreign currencies under sufficient control so as to reduce the harmful spillover effects that can destabilize foreign exchange markets. It is also considering various ways to reduce capital flow volatility and improve crisis response capabilities by enhancing monitoring and surveillance of the markets.

The additional measures include prudential rules to prevent excessive leveraging in the banking sector by putting a ceiling on banks' forward exchange positions, for instance, and rules designed to strengthen regulation on financial institutions with regard to foreign exchange liquidity risk.

The timing of these measures will be determined in accordance with developments in the global financial and the progress of international discussion within the G20.

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