

**Regulation and Supervision for
Sound Liquidity Risk Management for Banks**

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Korea Institute of Finance

I. Introduction

The root causes of the current global crisis are well summarized in the Declaration of the G20 Summit on Financial Markets and the World Economy held in Washington D.C. in 2008.

“During a period of strong global growth, growing capital flows, and prolonged stability earlier this decade, market participants sought higher yields without an adequate appreciation of the risks and failed to exercise proper due diligence. At the same time, weak underwriting standards, unsound risk management practices, increasingly complex and opaque financial products, and consequent excessive leverage combined to create vulnerabilities in the system. Policy-makers, regulators and supervisors, in some advanced countries, did not adequately appreciate and address the risks building up in financial markets, keep pace with financial innovation, or take into account the systemic ramifications of domestic regulatory actions.”

Although the crisis started off as an isolated event in the US subprime mortgage market which represents only about 14 percent of US mortgage market, it quickly escalated and engulfed all kinds of financial markets and institutions. This process is described under various names including ‘liquidity spiral’ (IMF 2008), ‘risk amplifier’ (Bank of England 2008), and ‘financial accelerator’ (Bernanke 2007), which made the crisis ‘wider, deeper and more damaging than originally thought’¹. And it has spread fast to all over the world through, for example, ‘an international financial multiplier’ (Krugman 2008).

Globalization has probably facilitated contagion of the 2008 financial crisis. The process of globalization and financial development has been prone to crises. This appears to be partly intrinsic and partly due to policy mistakes. It arises as banks expand and capital markets generate various financial products, including derivatives. This entails new and unfamiliar risks for financial intermediaries and regulators. Furthermore, crises are easily transmitted across borders as countries become more open to capital flows.

While the long-run relationship between financial development and growth is positive.

¹ Federal Reserve Bank Chairman Bernanke testified in July 2007 that credit losses associated with subprime mortgages would probably total \$50 to \$100 billion.

In the long run, financial development is expected to support economic growth and to reduce poverty. But, along the way, even relatively mature financial systems are vulnerable to banking crises, booms and busts, and financial volatility (World Bank 2008). Due to this financial fragility the short-run relationship between them is negative.

Developing countries have taken measures to build up buffers and insulate themselves from the external shocks, by accumulating large reserves, switching to long-term and domestic currency borrowing, and reducing fiscal and current account deficits. However hard they try, it is difficult to avoid the tradeoff between the benefits of economic and financial integration and the risk of being susceptible to contagious effects.

Some aspects of the financial integration process, however, can change the terms of the tradeoff. These include how much the country relies on portfolio investment of international investors and foreign direct investment (FDI). Also a sound legal framework and stable political environment that attracts foreign capital and the influence of a country's history of default on capital flows are important factors.

But the market turmoil that began in mid-2007 re-emphasized the importance of liquidity to the functioning of financial markets and the banking sector (BIS 2009). In advance of the turmoil, asset markets were buoyant and funding was readily available at low cost. The reversal in market conditions illustrated how quickly liquidity can evaporate and that illiquidity can last for an extended period of time. A credit crunch and illiquid financial markets make it hard for banks to find alternative funding sources, roll-over their debts, and mitigate maturity mismatches. So the banking system came under severe stress, and many banks struggled to maintain adequate liquidity. Unprecedented levels of liquidity support were required from central banks in order to sustain the financial system. Even with such extensive support a number of banks failed, were forced into mergers or required resolution.

In fact banks face various risks everyday such as market risk, credit risk, liquidity risk, etc. Among these, liquidity risk and its management did not receive the same level of scrutiny and priority as other risk areas. But the global financial crisis has shown just how unstable banks' sources of funding can become.

In particular banks in many Asian countries are exposed to foreign currency liquidity risk because their local currencies are not internationally accepted as a key currency. Moreover, since international trade plays an important role in many Asian countries, foreign currency liquidity risk management is crucial for the soundness of such banks. If the worldwide financial market is unstable, those banks are likely to have difficulty accessing foreign funds and liquidating foreign assets. Their foreign currency maturity mismatches might, in turn, be severe, with negative foreign currency cash flows.

Each country has its own forms of regulation and supervision of liquidity risk management. Most countries have quantitative regulations, such as the liquidity ratio and the maturity gap ratio, and this approach is supposed to provide a tool to prevent banks from insolvency. It, however, does not take financial market conditions into account. Some countries have adopted requirements for bank liquidity risk management through stress testing, constructing contingency plans, etc. With liquidity risk becoming more important as the financial crisis intensifies, it is meaningful to review current regulation and supervision on bank liquidity risk management in Asian countries and analyze the merits and drawbacks of such regulations, especially those regarding foreign currency liquidity management.

This document is organized as follows. The next chapter discusses the origin of the US dollar shortage in global banking. Chapter III presents the recommendations and guidances on liquidity risk management from various institutions organizations. Chapter IV introduces major regulatory and supervisory changes regarding liquidity risk management framework in Korea. Chapter V concludes with some policy issues.

II. The US Dollar Shortage in Global Banking

1. The origin of the global US dollar shortage

Throughout the recent global crisis, but particularly following the collapse of Lehman Brothers in September 2008, many banks faced severe difficulties securing short-term US dollar funding. In response, central banks around the world adopted extraordinary policy measures, including international swap arrangements with the US Federal Reserve, to enable them to provide US dollars to commercial banks in their respective jurisdictions.

McGuire and von Peter (2009) explains well what caused this global shortage of US dollars, which banking systems have been most affected, and how a shortage could develop so quickly after dollar liquidity had been viewed as plentiful. According to them, there are two strands of research explaining the cause of global dollar shortage.

One is the familiar domestic bank run story which remains relevant in some emerging markets context. In the open economy version of the traditional bank run model, depositors run the bank and convert their domestic deposits to foreign currency (Chang and Velasco (2000, 2001)) or, in the case of liability dollarization, directly withdraw dollars (Rajan and Tokatlidis (2005)). The resulting demand for foreign currency, being proportional to domestic bank liabilities, can easily exhaust the country's FX reserves (Obstfeld et al (2009)).

The other traces the origins of the US dollar shortage to the international operations of the major banking systems and to the global funding and swap markets on which they rely. That is, in contrast to many previous international financial crises, it argues that it was banks' international exposures to other industrialized countries that deteriorated, and the global interbank and FX swap funding structure which seized up.

Previous episodes with similar international dimensions include the lengthening of the maturity of Latin American dollar debt in the early 1980s, which raised concerns about a maturity mismatch on European banks' balance sheets (McCauley (1984)). Another case is

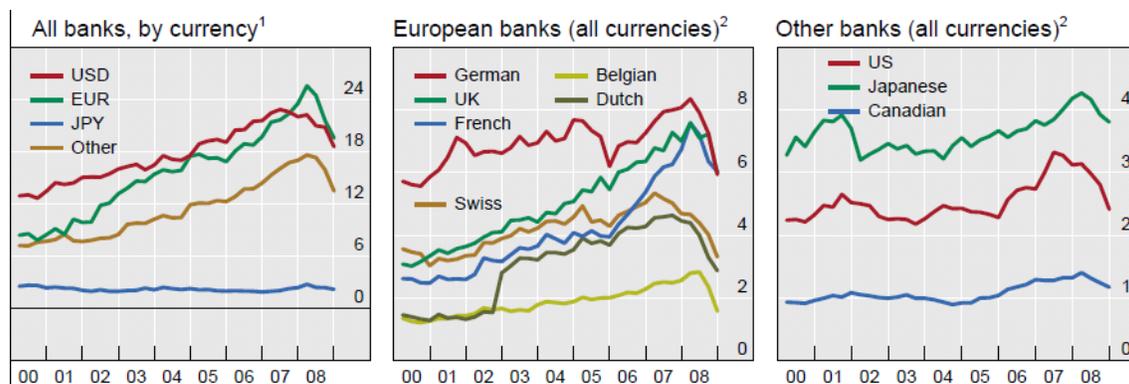
the “Japan Premium” faced in the 1990’s by Japanese banks, which had financed their global expansion in the eurodollar and euroyen markets (Peek and Rosengren (2001)).

2. The Size of Funding Gap

The funding difficulties which arose during the crisis are directly linked to the remarkable expansion in banks’ global balance sheets over the past decade. Reflecting in part the rapid pace of financial innovation, banks’ (particularly European banks’) foreign positions have surged since 2000, even when scaled by measures of underlying economic activity.

The outstanding stock of banks’ foreign claims grew from \$10 trillion at the beginning of 2000 to \$34 trillion by end-2007, a significant expansion even when scaled by global economic activity. The year-on-year growth in foreign claims approached 30% by mid-2007, up from around 10% in 2001. This acceleration took place during a period of financial innovation, which included the emergence of structured finance, the spread of “universal banking”, which combines commercial and investment banking and proprietary trading activities, and significant growth in the hedge fund industry to which banks offer prime brokerage and other services.

<Figure> Trends of Balance Sheet Expansion and Foreign Claims



Source: McGuire and von Peter (2009)

As banks’ balance sheets grew, so did their appetite for foreign currency assets, notably US dollar-denominated claims on non-bank entities. These assets include retail and corporate

lending, loans to hedge funds, and holdings of structured finance products based on US mortgages and other underlying assets. During the build-up, the low perceived risk (high ratings) of these instruments appeared to offer attractive return opportunities; during the crisis they became the main source of mark to market losses.

Beginning in August 2007, heightened counterparty risk and liquidity concerns compromised short-term interbank funding (Taylor and Williams (2009)). The related dislocations in FX swap markets made it even more expensive to obtain US dollars via currency swaps (Baba and Packer (2009a)), as European banks' US dollar funding requirements exceeded other entities' funding needs in other currencies.

European banks' funding difficulties were compounded by instability in the non-bank sources of funds as well. Money market funds, facing large redemptions following the failure of Lehman Brothers, withdrew from bank-issued paper, threatening a wholesale run on banks (Baba et al (2009)). Less abruptly, a portion of the US dollar foreign exchange reserves that central banks had placed with commercial banks was withdrawn during the course of the crisis. In particular, some monetary authorities in emerging markets reportedly withdrew placements in support of their own banking systems in need of US dollars.

Banks reacted to the dollar shortage in various ways, supported by actions taken by central banks to alleviate the funding pressures. Reflecting considerable demand in the aftermath of the Lehman bankruptcy, the amount of US dollars provided globally through international dollar swap lines surged in October 2008, and peaked at \$583 billion in December 2008 (Federal Reserve Statistical Release H.4.1). Since then, the use of swap lines has gradually subsided, to \$50 billion by early October 2009.

III. Guidances and Recommendations

Various institutions and organizations have issued guidance and recommendations for sound practices for managing funding and liquidity risk. To name a few:

- Principles for Sound Liquidity Risk Management and Supervision (Basel Committee on Banking Supervision)
- The Turner Review (Financial Services Authority)
- Financial Reform (Group of 30 Report)
- Proposed Interagency Guidance-Funding and Liquidity Risk Mgmt (FDIC, FRB, Treasury)
- Fundamental Principles of Financial Regulation (Geneva Report)
- De Larosiere Report (EU)

1. Basel Committee

In February 2008 the Basel Committee on Banking Supervision published Liquidity Risk Management and Supervisory Challenges. And in order to account for financial market developments as well as lessons learned from the recent global financial turmoil, the Basel Committee has conducted a fundamental review of its 2000 Sound Practices for Managing Liquidity in Banking Organizations. And resulting Guidance has been significantly expanded in a number of key areas. In particular, more detailed guidance is provided on:

- the importance of establishing a liquidity risk tolerance;
- the maintenance of an adequate level of liquidity, including through a cushion of liquid assets;
- the necessity of allocating liquidity costs, benefits and risks to all significant business activities;
- the identification and measurement of the full range of liquidity risks, including contingent liquidity risks;
- the design and use of severe stress test scenarios;

- the need for a robust and operational contingency funding plan;
- the management of intraday liquidity risk and collateral; and
- public disclosure in promoting market discipline.

Principle 1 is the fundamental principle for the management and supervision of liquidity risk. Principles 2 to 4 are about Governance of liquidity risk management. Principles 5 to 12 explain Measurement and management of liquidity risk. Principle 13 is about Public disclosure. Principles 14 to 17 provide guidance on the role of supervisors.

2. Turner Review

In the Turner Review, with subtitle of A regulatory response to the global banking crisis, pointed out that the way forward on liquidity risk management should reflect three considerations:

First, liquidity risk has inherently systemic characteristics, with the reaction of one bank to liquidity strains capable of creating major liquidity strains for others. In the period between mid-September and mid-October, 2008, the simultaneous attempt by multiple banks to improve their liquidity position by shortening the tenor of their placements in the interbank market, contributed to a generalized collapse of liquidity.

Second, liquidity management has become increasingly complex over time, with a widening set of potential sources of liquidity (in both securitized and non-securitized forms), and with an increased reliance on ‘liquidity through marketability’ alongside traditional liquidity through funding access. This makes it difficult to base good liquidity regulation primarily on one or a few standard ratios comparable to the capital adequacy ratio used to regulate solvency.

Third, at the macroeconomic and macro-prudential level, there is a tradeoff to be struck. Increased maturity transformation delivers benefits to the real sectors of the economy and produces term structures of interest rates more favorable to long-term investment. But the greater the aggregate degree of maturity transformation, the more the systemic risks.

3. Geneva Report

The Geneva Report on the World Economy from International Center for Monetary and Banking Studies proposed two measures to overcome liquidity risk:

The first measure is a ‘mark-to-funding’ accounting rule. This approach is recommending that assets should be valued and managed in a crisis, not according to the intention of the holder or the short-term vagaries of the market, but according to the capacity of the holder. In other words, if a bank has funded its twenty-year assets with one-month borrowings, whatever their intention, they should value the asset with the expected price of the asset in one month time. In particular, it can ignore temporary price movements within a month. If a bank is funded over the short-term, this approach will provide no more relief and would be no less pro-cyclical than mark-to-market value accounting. However, this would be a fair reflection of the price risk the firm faces if funding is not rolled over.

The second measure to overcome liquidity risk is to impose a capital charge on it. Conceptually, it means that regulatory capital should be set aside against the riskiness of the combination of an asset and its funding, since the riskiness of an asset depends to a large extent on the way it is funded. The goal of this liquidity adjusted capital charges is to encourage banks to find long-term funding, and dissuade them from greater leverage.

4. The Group of 30 Report

There are three points in the Recommendation number 11 in the Group of 30 Report.

Firstly, it recommends that base-level liquidity standards should incorporate norms for maintaining a sizable diversified mix of long-term funding and an available cushion of highly liquid unencumbered assets. Once such standards are developed, it goes further that consideration should be given to what is the preferred mix of senior and subordinated debt in bank capital structures.

Secondly, it also recommends that supervisory guidance for liquidity standards should

be based on a more refined analysis of a firm's capacity to maintain ample liquidity under stress conditions, including evaluation of the quality and effectiveness of its liquidity management policies and contingency funding plan.

Thirdly, it recommends that liquidity disclosure standards should complement the suggested improved disclosure practices for capital and risk profile information. This recommendation for standards for liquidity risk management comes from the observation that two interrelated sets of liquidity strains have characterized the current financial crisis.

One is the evaporation of active markets for assets apart from government securities with the consequence that price discovery in many markets became unreliable. The other is strains on funding, as reflected in the dislocations in the interbank funding markets and the virtual shutdown of term debt funding markets for even highly rated financial institutions.

The extent of these strains suggests that enhanced risk-based capital standards are by themselves not a sufficient basis for ensuring financial stability. Standards are also needed for liquidity risk. Stronger, more systematic measures need to be taken that build on the framework used for capital standards. A first step in this regard was taken in early 2008 with the Basel Committee's Principles for Sound Liquidity Risk Management.

5. CRMG Recommendations

CRMG (Counterparty Risk Management Policy Group)² also made recommendations in the following areas: Maximum Liquidity Outflow (MLO) stress testing, availability of unencumbered highly-liquid reserves, structural and long-term liquidity, and a more encompassing approach to liquidity management.

For example, as for MLO stress testing, the Policy Group recommends that all large integrated financial intermediaries should, on a regular basis, conduct liquidity stress tests to measure their MLO. Stress tests should be based on scenarios that consider how normal sources of liquidity, both secured and unsecured, could be disrupted for the firm, the markets,

² *Containing Systemic Risk : The Road to Reform*, The Report of the CRMPG III, 2008. 8

or both. The stress test scenarios should focus on potential liquidity outflows, taking into account a firm's particular vulnerabilities. The Policy Group further recommends that, in addition, at a minimum, firms monitor their MLO within the first 30 days and for additional intervals within this timeframe (for example, overnight, one week, two weeks). The MLO is defined as the net loss of liquidity under the firm's most severe scenario from the time of the calculation for the tenors prescribed.

The Policy Group recommendation specifies what should be considered s in stress scenarios, both for purposes of stress testing and calculation of MLO.

- Include both firm-specific and systemic events and their overlapping nature.
- Consider extreme shocks as well as progressive events.
- Take into account implicit as well as explicit risks and potential damage of a firm's actions to its franchise.
- Review the potential for loss of key sources of secured and unsecured funding, including deposits, commercial paper, and other short- and long-term debt. Firms should also consider the impact of funding illiquidity on asset-backed commercial paper conduits and on the ability to securitize pools of assets.
- Analyze the potential outflows related to customer activity, including prime brokerage.
- Examine the impact of on- and off-balance sheet exposures including the potential outflows related to derivative transactions, liquidity commitments, and special purpose vehicles.
- Consider the impact of intra-day liquidity exposures, including the heightened interests of counterparties to accelerate trades and settlements in times of stress and other time-related mismatches in the flow of funds.
- Consider other large cash payments including salaries, taxes and lease payments.
- As with all liquidity practices, evaluate the impact on both individual legal entities, as well as the consolidated firm.
- Consider the availability of central bank facilities. Generally speaking, extraordinary central bank facilities, such as the Federal Reserve System's Primary Dealer Credit Facility, should not be considered an element of an effective liquidity plan.

IV. Regulation and Supervision for Sound Liquidity Risk Management in Korea

1. Crisis prevention and Liquidity Risk

Recent events have exposed weaknesses in liquidity risk measurement and management systems at both firms and the economy level. Deficiencies include 1) insufficient holdings of liquid assets, 2) funding risky or illiquid asset portfolios with potentially volatile short-term liabilities, and 3) a lack of meaningful cash flow projections and liquidity contingency plans (FDIC 2009).

A liquidity management process should be sufficient to meet the daily funding demand, and cover both expected and unexpected deviations from normal operations. By assuring the ability to meet the liabilities as they come due, liquidity management can reduce the probability of an irreversible adverse situation developing.

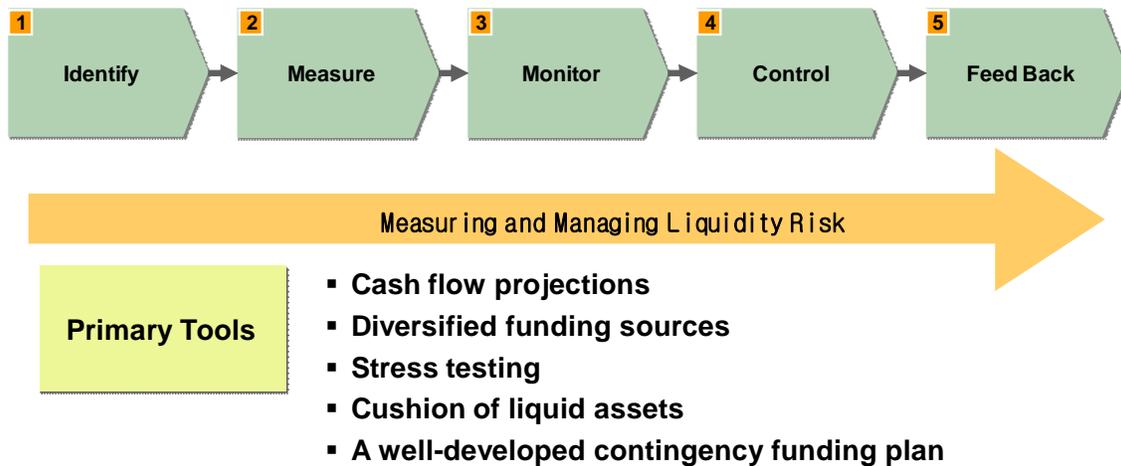
But we cannot ignore some underlying ‘truths’ in banking (Matz and Neu(2006), Chang and Velasco(2001)). First of all, full liquidity is costly and risk managers can’t justify the cost of holding a large enough quantity of immediately available liquidity to cover the least likely threats. Hence, no financial institution can afford to hold enough liquidity to survive a severe or prolonged funding crisis. Liquidity mismatches are simply too big. Yet, since the least likely threats can have devastating consequences, risk managers can’t ignore them. When we attempt to prevent crises, we face some unpleasant trade-offs.

And financial institutions can never avoid liquidity risk. Serving as liquidity intermediaries transforming maturities is one of the ways that banks add value to the economy. There is no way to do this without a mismatched balance sheet. Most contingent liquidity risk is created from the liquidity intermediation function. In addition financial institutions can do little to hedge liquidity risk. Some contingent lending arrangements exist. But only a few remain in place in the event that the borrowing bank’s risk increases.

Accordingly, we should have a comprehensive management process for *identifying*,

measuring, monitoring and controlling liquidity risk. From this point of view, liquidity risk management can be defined as the bridge between the liquidity the bank chooses to hold and the maximum it might need. Because of the critical importance to the viability of the institution, liquidity risk management should be fully integrated into the institution's risk management processes.

<Figure> Measuring and Managing Liquidity Risk



Measuring and managing liquidity are among the most vital activities of commercial banks. Primary tools involved in this process include:

- Cash flow projections,
- Diversified funding sources
- Stress testing
- Cushion of liquid assets
- A well-developed contingency funding plan (CFP)

2. Adoption of Bank Standards on Liquidity Risk Management

As we have seen in the above, several international supervisory institutions raised the need for the liquidity risk management of banks to be strengthened internationally. The international financial supervisory institutions included the Basel Committee of the Bank of International Settlements, the Financial Services Authority, and the Committee of European Banking Supervisors.

Financial Supervisory Services (FSS) also reflected the subject matters carefully. And after reviewing the current systems and reflecting the characteristics of Korean financial market, the FSS produced the guidance “Bank Standards on Liquidity Risk Management” in September 2009, with a view to strengthening domestic banks’ liquidity risk management and to ensuring international compatibility.

Banks in Korea have thus far managed liquidity risk largely via quantitative indices, such as the Korean won liquidity ratio and the maturity gap. It is expected, however, that a more sophisticated and integrated liquidity risk management will be effected in the foreseeable future.

The guidance contains a comprehensive treatment of liquidity risk management systems, including liquidity risk management, stress tests, and contingency funding plans. Following this guidance, banks shall establish and operate liquidity risk management strategies that comprise at least of liquidity risk management targets, management policies, and internal controls. The boards of directors of a bank will approve and review the strategies with respect to reports submitted on a regular basis on liquidity conditions and stress test results.

Banks are also required to assess liquidity-related costs and risks to reflect in performance evaluation and in the approval process of new products. In particular, banks should manage the liquidity risk tolerance through accumulated net cash outflow derived from its financial positions and funding capacities.

In addition banks are to establish and operate early warning systems. As for funding, its sources should be diversified to prevent concentration in a particular currency and maturity. Banks shall conduct stress tests regularly and reflect the results in the liquidity risk management strategies, risk tolerance, and contingency funding plans. Also, banks are required to make practical contingency funding plans respective of the graduated stress levels and regularly review the plans for appropriateness.

The FSS plans to provide guidelines that include previous management cases to help take the liquidity risk management systems of banks fast and firm root.

<Table> Main Provisions of Bank Standards on Liquidity Risk Management

| Main provisions | |
|--|---|
| Liquidity risk management | |
| Establishing management strategy | <ul style="list-style-type: none"> • Establish and operate liquidity risk management strategies, incl. liquidity risk management targets, management policies, and internal controls |
| Internal controls | <ul style="list-style-type: none"> • Reflect liquidity-related costs, benefits, and risks to products pricing, performance evaluation, and new products approval process |
| Liquid assets | <ul style="list-style-type: none"> • Reflect results of stress tests to sufficiently hold quality liquid assets |
| Diversification of funding sources | <ul style="list-style-type: none"> • Set and manage target to alleviate concentration and diversify maturity dates |
| Security management | <ul style="list-style-type: none"> • Systematically manage collateral positions of assets held |
| Risk assessment | <ul style="list-style-type: none"> • Measure degree of changes in liquidity risk that follows future cash flows |
| Risk tolerance & early warning systems | <ul style="list-style-type: none"> • Identify the factors that affect liquidity risk • Measure degree of changes in liquidity risk that follows future cash flows • Manage early warning systems in addition to risk tolerance to discern and respond early to deterioration in liquidity risk |
| Role of board of governors | <ul style="list-style-type: none"> • Approve and review, among others, liquidity risk management strategies • Receive regular and periodic reports on liquidity conditions |
| Stress tests | |
| Stress tests | <ul style="list-style-type: none"> • Conduct regular stress tests and reflect the results in the liquidity risk management strategies, risk tolerance, and contingency funding plans |
| Scenario design | <ul style="list-style-type: none"> • Scenarios to include institution-specific and market-wide stresses • Review appropriateness of scenarios through sensitivity analysis |
| Contingency funding plans | <ul style="list-style-type: none"> • Make practical contingency funding plans respective of the graduated stress levels and regularly review the plans for appropriateness |

Source: FSS

The provisions are expected to be finalized for confirmation upon satisfying and completing all of the procedures governing regulation amendments, including the opinions gathered from advance notices, before being adopted in the “Enforcement Rules of the Regulation of Supervision of Banking Business.” Plans are in store to conduct inspections after receiving implementation plans from the respective banks once the related Enforcement Rule is adopted.

In order to lessen the burden on banks, the Standard will complement the liquidity risk evaluation standards of RADARS, the current binding regulation on risk management evaluation. The Standard will also be reflected in CAMELS, FSS’s evaluation system for management.

3. Supervision of Financial Institutions’ FX Soundness

The soundness of domestic financial institutions’ foreign-exchange management recovered to pre-crisis levels on the strength of the government’s countermeasures and the voluntary efforts of institutions. But insofar as the weak links in their FX management became apparent during the crisis, the need has grown to fine-tune related systems to prevent a crisis from relapsing even while steps continue to be taken to improve FX soundness. The Financial Stability Board has also proposed to develop measures abating potential risk of systemic instability caused by FX liquidity problems in emerging market economies at the time of crisis.

It was in this regard that the government unveiled last September 25, 2009 the ‘Financial Institutions’ FX Soundness & Strengthened Supervision’, outlining the basic direction of the plan. Nonetheless, this measure is not intended to regulate foreign capital being invested in Korea, but merely an attempt to enhance the soundness of financial institutions.

The plan contains two main sections, namely strengthened supervision over the FX soundness of individual financial institutions and strengthened supervision over

macroprudential soundness of FX management. The section on the FX soundness of individual financial institutions outlines **six measures** to be taken:

- fine-tuning the regulation on FX liquidity ratio;
- establishing new standards in FX liquidity risk management;
- establishing new standards in FX derivatives;
- strengthening the long-term resource funding ratio;
- introducing the regulation on FX asset limits; and
- encouraging rational FX hedging practices.

The component on macro-prudential soundness of FX management includes:

- preemption through strengthened monitoring over FX market; and
- planning countermeasures during contingencies.

To move the plan forward, a joint working team comprised of experts from the FSC/FSS and banks is to subsequently take the lead in formulating detailed guidelines.

3.1 Current Regulation on Financial Institutions' FX Soundness

<Box> Current Regulations on the Management of Soundness of Foreign Exchange Affairs in Korea

I. Enforcement Decree Of The Foreign Exchange Transactions Act

Article 21. (Regulation on Asset Quality)

The Minister of Finance and Economy, if he intends to set necessary restrictions on the business of foreign exchange agencies, money changers, and foreign exchange brokers (hereinafter referred to as "foreign exchange agencies") pursuant to Article 11 (2) of the Act, shall do so according to the following standards: <Amended by Presidential Decree No. 17021, Dec. 27, 2000>

1. Where the minimum of payment reserves for specific foreign currency liabilities is

- set, the scope of such foreign currency liabilities, and the currency subject thereto, when to accumulate, and the minimum of payment reserves shall be determined;
2. Where the limit on excess of buying or selling foreign currency is set, the separation and limit on excess of buying and selling foreign currency, the scope of assets and liabilities as standards for calculation, the calculating method, and the time and period shall be determined;
 3. Where the method of raising and operating foreign currency funds is designated, such raising and operating items and the raising and operating method by item shall be determined;
 4. Where the ratio of foreign currency assets and liabilities is set, the raising and operating method of funds by maturity and the scope of and standards for assets and liabilities shall be determined;
 5. Where it is necessary to establish an account operated for non-residents by raising funds from non-residents, the scope of foreign exchange agencies to be established, the standards for raising and operating method of funds, and the accounting method shall be determined;
- 5-2 Where the accounting standards for the foreign exchange account at the institutions dealing with the foreign exchange business are set, the title of accounts and the accounting methods shall be determined;
6. Where risk management standards incidental to foreign exchange business are set, such business to be covered and standards shall be determined;
 7. Where standards for foreign exchange brokerage are set, the business subject thereto or the operational methods shall be determined; and
 8. Where standards for foreign exchange business on money changers are set, objects subject to restrictions and standards for selling foreign currency shall be determined.

II. Regulation on Foreign Exchange Transactions

Article 2-9. (Limit of FX positions)

(1) The limit of FX position is as follows.

1. Aggregate net long positions which is the sum of each net long positions for all foreign currency should not exceed 50% of the capital. In the case of Korea EXIM Bank, the limit is 150% of total foreign currency loans.
2. Aggregate net short position which is the sum of each net short position for all foreign currencies should not exceed 50% of the capital.

(2) When a foreign bank branch requests more net long positions to hedge the FX risk of its own retained earning, the governor of Bank of Korea can raise the position limit for the

foreign bank branch.

- (3) The capital in (1) above is defined as the sum of paid-in capital, retained and deferred earnings. In the case of foreign bank branches, it is the sum of KAP-fund, EUL-fund, retained and deferred earnings.
- (4) The head of a FX bank is required to report the bank's FX position to the Governor of Financial Supervisory Service via the Governor of Bank of Korea every month.

III. Regulation on Supervision of Banking Business

Section 2. Management of Soundness of Foreign Exchange Affairs

Article 63. (Exchange Rate Risk Management)

- (1) Pursuant to Article 21, Item 2 of the enforcement decree of the Foreign Exchange Transactions Act, an institution to deal with foreign exchange affairs shall confirm whether the limit on the overbought amounts and oversold amounts of foreign exchange (hereinafter, the "limit on foreign exchange position") is well complied or not on the basis of balance every business day. However, the foreign exchange position on Saturdays or holidays of the New York foreign exchange market shall be made on the basis of average balance aggregated with the foreign exchange position of the following business day.
- (2) When in violation of the limit on foreign exchange position, an institution to deal with foreign exchange affairs shall report the fact to the Governor within three (3) business days from the date of violation.

Article 64. (Liquidity Risk Management)

- (1) An institution to deal with foreign exchange affairs shall manage its assets and liabilities denominated in foreign currency by classifying them based on each residual maturity under Article 21, Item 4 of the enforcement decree of the Foreign Exchange Transactions Act, and maintain the liquidity ratio in foreign currency under each of the following Items:
 1. Ratio of assets within three (3) months of residual maturity to liabilities within three (3) months of residual maturity: 85/100 or above; <Amended on December 31, 2003 and effective on April 1, 2004> and
 2. Ratios of maturity mismatch between assets and liabilities in foreign currency:
 - a. Ratio of assets exceeding liabilities to total assets, when the residual maturity is due less than seven (7) days: 0/100 or above
 - b. Ratio of liabilities exceeding assets to total assets, when the residual maturity is

due less than one (1) month: 10/100 or below

- (2) The method of classifying residual maturity, the scope of assets and liabilities, and the method of ratio calculation under Paragraph (1) shall be determined by the Governor.

Article 65. (Management of Funding Resources for Medium and Long Term Loans in Foreign Currency)

- (1) When an institution to deal with foreign exchange affairs makes a foreign currency loan with maturity of one (1) year or longer, 80/100 or more of such loan amount shall be covered by foreign currency fund borrowed with maturity of one (1) year or longer pursuant to the provisions under Article 21, Item 4 of the enforcement decree of the Foreign Exchange Transactions Act. However, this shall not apply to where the outstanding amount of foreign currency loans is less than US\$50million. <Amended on December 31, 2003 and Effective on April 1, 2004>
- (2) The scope of foreign currency loan and foreign currency borrowing stipulated in Paragraph (1) shall be determined by the Governor.

Article 67. (Internal Management of Financial Institution)

- (1) An institution to deal with foreign exchange affairs shall set up and operate its own internal management standards by types of such risks arising from foreign exchange transactions as country risk, large credit risk, financial derivatives transaction risk, market risk, and others pursuant to Article 21, Item 6 of the enforcement decree of the Foreign Exchange Transactions Act.
- (2) In the event an institution to deal with foreign exchange affairs intends to newly establish and alter its risk management standards mentioned in Paragraph (1) or conduct foreign exchange transactions exceeding the standards, it shall refer the matter to its internal risk management committee for a resolution.
- (3) The Governor shall establish exemplary standards for each type of the risks mentioned in Paragraph (1), and may request correction of the risk management standards of an institution to deal with foreign exchange affairs in the event they are deemed inappropriate.

3.2 Strengthened Supervision

3.2.1 Fine-tuning the Regulation on FX Liquidity Ratio

The maturity mismatch of banks' FX assets and liabilities is currently being addressed through the minimum FX liquidity ratio, which has been established and is being operated on a 7-day, 1-month, and 3-month basis. The current standard, however, has given rise to a question of what level efficiency can be reached during a liquidity crunch since the ratio is arrived at on the assumption that all assets would be recoverable at any given time irrespective of an asset's marketability. What's more, indications point to the excessive regulatory costs associated with compliance in the case of the stringent 7-day gap ratio.

The plan on 'Financial Institutions' FX Soundness & Strengthened Supervision' has proposed to arrive at the liquidity ratio by reflecting the recoverable rate of FX assets. The recoverability of each respective asset class would also be determined by reflecting international standards and costs related to regulatory compliance. The 7-day gap ratio is to be changed from the current 0% to above -3%.

<Table > Liquidity Weighting (Effective from July 1, 2010)

| Asset class | | Weightings (%) | |
|--|---|----------------|-------|
| | | Before | After |
| FX & deposits, FX call loans, FX purchases | | | 100 |
| FX loans (incl. leases) | Interbank loans, Domestic import usance, Facility capital investment loans conditioned on installment repayment | | 100 |
| | Overseas demand based loans, Facility capital investment loans | | 90 |
| | Operating capital, and others | | 80 |
| FX securities | Government bonds | A - AAA | 100 |
| | | BBB - A | 90 |
| | | BBB & lower | 60 |
| | Corporate bonds | A - AAA | 90 |
| | | BBB - A | 85 |
| | | BBB or lower | 50 |
| Stocks (incl. beneficiary certificates) | Listed | 55 | |
| | Unlisted | 35 | |
| Futures assets | | | 85 |
| Others | | | 100 |

Source : Financial Services Commission

3.2.2 New Standards for FX Liquidity Risk Management

Establishing a predictable framework of internal controls has become as imperative as the possibility of FX liquidity risk metastasizing into systemic risk. The current 'Liquidity Risk Management Standards', which came into effect last September 2009, will be supplemented with new provisions entitled, 'Characteristics Peculiarly Affecting FX Liquidity Management' to establish the new 'FX Liquidity Risk Management Standards'.

The new standards will set mandatory guidelines on, among others, currency-specific liquidity risk management, the establishment and operations of an early warning system, estimate on capital outflow during crises, and contingency funding plans.

3.2.3 Mandatory Minimum Holdings of Safe FX Assets

The majority of financial institutions came to rely on the capital support of the government to counter the shortage in FX liquidity experienced during the recent crisis. In order to enable institutions to respond independently to situations where FX liquidity shortages follow outflows of FX capital in times of a crisis, mandatory minimums will be set for safe FX asset holdings. For such purposes, safe FX assets is defined as government bonds rated higher than single A and deposits in the central banks of countries rated higher than single A as well as corporate bonds rated higher than single A.

In establishing holding limits, financial institutions will retain the option to adopt one of the following two in the interests of offsetting costs.

- Borrowings maturing in less than 1-year $\times \frac{2}{12} \times (1 - \text{lowest refinancing rate})$, where the lowest refinancing rate is defined as the lowest weighted 3-month average refinancing rate exercised during the recent crisis.
- More than the fixed ratio in relation to total FX assets, where the fixed ratio is initially set at 2%, but subject to review for adjustment according to prevailing conditions.

3.2.4. New Standards for FX Derivatives Trading Risk Management

Despite the fact that excessive trading in FX derivatives by some of non-financial companies gave rise to considerable public outcry, financial institutions' counterparty credit risk management has been inadequate. To address the issue, the currently in force 'Derivatives Execution Best Practices' will incorporate more detailed guidelines outlining FX derivatives trades before establishing the new 'FX Derivative Trading Risk Management Standards'.

FX forward transactions will thus be limited to a fixed ratio of a maximum of 125% vis-à-vis physical trade to prevent excessive FX hedging. In cases where an upward adjustment in the fixed ratio is deemed necessary, however, prior approval will be required from the Risk Management Committee, among possible others. The reporting of transactions executed with other financial institutions will be required while the transaction limit will extend to those entered into separately with individual producers.

As part of credit risk management, the standards of 'Derivatives Execution Best Practices' will apply to all institutions dealing in foreign currencies with the exception of nonbanking financial institutions. Counterparties to the standards will not only apply to retail investors as provided for in the Financial Services and Capital Market Act (FSCMA) but also sophisticated investors with the exception of financial institutions.

<Table > Standards Application & Guidelines

| | | Applicability | Transactions limit |
|---------------------------------------|------------------------|---------------|--------------------|
| FSCMA-set retail investors | | Yes | Less than 100% |
| FSCMA-defined sophisticated investors | Corporate investors | Yes | Between 100-125% |
| | Financial institutions | No | No limit |

Source: Financial Services Commission

3.2.5. Tightened Regulations to Increase Mid- to Long-term Financing in Foreign Loan Portfolios

The current regulation on the ratio of mid- to long-term financing in foreign loan portfolios (mid- to long-term financing / mid- to long-term lending) is designed to increase long-term financing in banks' borrowing structure. However, the current ratio of 80% or more is ineffective, and some point out that regulating in terms of '*1 year or more*' is not in line with international standards.

Thus, it was decided to change the criteria for mid- to long-term foreign loan financing from '*1 year or more*' to '*more than 1 year*' while the calculation standard and classification will be the same with short-term foreign loans. In addition, the ratio regulation will be tightened from the current 80% or more to 90% or more. Based on results next year, the ratio will gradually be revised upwards. Meanwhile, the ratio of '90% or more' is a minimum ratio, so the FSC will work towards tightening it to 100% or more in the first half of 2010.

3.2.6. Promotion of Reasonable FX Hedge Practices by Asset Management Companies

The high foreign exchange hedge ratio of asset management companies in Korea is a major reason behind banks' short-term foreign borrowings. It is also pointed out that it restricts investors' choice of fund products.

In this regard, it was decided to provide customers more information on forex hedge costs and effects through prospectus (Reflected in 'Standard for Producing Corporate Public Announcement Form' in mid December and publically announced in 2010) and public announcements by the Korea Financial Investment Association. It was also decided to introduce investment products with different forex hedge ratios.

In this connection, the Korea Financial Investment Association will revise the 'Working Rules on Standard Investment Recommendation' for mother funds to have various types of son funds with different hedge ratios.

3.2.7. Clarification of Rules over Mandatory Reporting of Foreign Exchange Transactions

Current rules over mandatory reporting of foreign exchange transactions will be clarified with specific information on reporting content, term, etc.

<Table > Changes in the Bank's Reporting Rules

| Report | Report | Term |
|---|--|-----------|
| Foreign assets and liabilities, foreign capital financing by maturity, reporting of operation status as determined by Chairman of FSS ⇒ | Foreign assets, classification of liabilities by time to maturity, and forex liquidity ratio | monthly |
| | Status of maturing foreign borrowings | monthly |
| | Financing and use of foreign capital | quarterly |

Source: Financial Services Commission

3.2.8. Foreign Asset Limit (leverage ratio) to be Further Discussed

Financial companies' excessive asset increase and borrowing were also noted as a major culprit behind the recent crisis. To address this issue, the Basel Committee on Banking Supervision is currently reviewing the introduction of leverage ratio regulations. It was noted that similar regulations should apply to foreign asset transactions in Korea. Based on the results of the discussions of the Basel Committee and others, the FSC will specify how, what, and when to apply such regulations.

These proposed measures are aimed at improving the system to enhance the soundness of foreign transactions and strengthen risk management competence of financial institutions. To ensure a smooth implementation, the measures will be introduced at levels that are achievable by the banking sector and will later be adjusted flexibly depending on institutional success and change in economic conditions.

Also the measures will initially apply to the banking sector, and, in principle, the measures will apply equally to every bank. However, Korea Export-Import Bank, Korea Development Bank, and other banks where government loss protection is provided for by law and where the government holds 90% or more of ownership are exempted from the obligation

to hold safe asset. Meanwhile, foreign bank branches are only subject to risk management standards on FX derivative transactions and reporting obligation; they will not be subject to liquidity ratio regulations and other direct regulations. Financial institutions other than banks are excluded from the application of the proposed measures, too. Based on the results in the banking sector, it will be further discussed whether to extend the measures to non-banking sectors.

In determining the level of measures, the case of U.K. will be taken as a reference; however, domestic financial companies' profitability and compliance costs will also be taken into account. In principle, the proposed plan will be implemented from early 2010. The requirement of holding higher portions of marketable assets and the holding of safe foreign assets as a result of tightened regulations over foreign currency liquidity ratio will be enforced from July 2010 in consideration of the time that the banking sector need to adjust to new rules. Moving ahead, the government is completing the revision of relevant statutes (Regulations and enforcement rules for supervision of banking sector) so that the proposed measures can be implemented in 2010.

4. Risk Management Guideline on FX Derivatives Transactions

The FSS, in conjunction with the Korea Federation of Banks, has made available the *Risk Management Guideline on FX Derivatives Transactions*. The Guideline was produced ahead of the new *Risk Management Standards on FX Derivatives Transactions*, which will come into effect in January 2010. The Guideline is designed to provide financial institutions with procedural instructions for compliance with the new *Standards* on top of outlining its main points.

To ensure a stable establishment of the new *Standards* and raise its level of efficiency, the *Guideline* was produced after many working-level deliberations, such as those with banks through joint discussions and a Task Force led by the Korea Federation of Banks.

4.1 Main Points

The *Guideline* puts forward detailed procedural instructions to assist financial institutions

comply with the new *Standards* on how to verify the assets, obligations, and contracts that corporate investors either currently have or are expected to have. This includes 1) verifying the actual assets, obligations and contracts individually on a case by case basis or 2) by projections based on companies' export-import records during the past three years, and/or reflecting the peculiar characteristics affecting a specific industry or company, such as past rates of growth and/or future prospects.

For the same purpose, financial institutions will be encouraged to explicitly include in the contracts, or additional contracts as the need may arise, conditions for annulling FX transactions since the *Standards* require companies be served with notices ahead of time under any of the following cases, those are:

- a company declines to provide needed materials to enter into an FX derivatives transaction;
- a company intentionally misleads a financial institution with the submission of false information; and
- a company fails to report an over-hedged position to its bank.

The *Guideline* puts forward details on how to determine the risk hedge ratio of companies, including those that take into consideration existing FX derivative contracts with other banks. Such existing contracts are verified either through material submitted by the companies themselves and/or through the 'Converged & Shared Derivative Transactions System' which, according to the related agreement between the Korea Federation of Banks and the respective banks, provides information focused on FX futures, currency options, FX swaps, and others.

The *Standards* stipulate a 125% limit on the amount a financial institution may carry on its hedge book against the risk hedges of a corporate investor, defined under the FSCMA as a professional investor other than a financial institution.

4.2 Anticipated Results from Changes

Banks' counterparty risk management on FX derivative transactions is expected to improve noticeably following implementation of *Risk Management Standards on FX Derivatives Transactions*. Company demand for such over-hedged products as KIKO will be checked in their early stages while banks can have the opportunity to manage counterparty risk in a consistent and predictable manner.

The changes are also expected to prevent increasing the volatility of FX market that follow excessive forward exchanges, and curtail banks' short-term foreign-currency borrowings that are inessential and not pressing.

4.3 Future Actions

The FSS will closely monitor the early stages of the *Standards* upon its introduction and continue its supervision to ensure that the system takes root. The FSS will work to enhance the stability of Korea Federation of Banks' 'Converged & Shared Derivative Transactions System' while making the requirements of the *Standards* better known to non-financial companies, such as exporters, by organizing a seminar on FX risk management in January 2010.

5. Derivatives Monitoring System

5.1 Overview

The FSS has completed building the Integrated Derivatives Information System with which it has commenced full systemic monitoring operations of derivative products. As a step to follow 'Derivatives Market Supervisory Augmentation Plans' introduced in December 2008, the new system is a result of approximately a year of joint private/public Task Force involving the FSS, FSC and others to achieve supervisory objectives in four main areas: 1) refurbishing monitoring operations of derivatives; 2) strengthening investor protection; 3) raising soundness of financial companies and preventing systemic risks; and 4) reestablishing the functions of both the financial supervisory authorities and the self-regulatory organizations.

5.2 Main Features of the System

The system allows the retrieved information to be sorted in more details that include counterparties, underlying assets, hedge transactions, and stress test results instead of simple transaction outstanding.

Limitations on the application of the retrieved information as a result of not having them codified are addressed by assigning standardized codes to counterparties, derivatives, and underlying assets, among others. Also Monitoring the structural and transaction characteristics of new derivatives is possible by making the reporting on them mandatory.

Beyond the purpose of keeping records, the retrieved information gathered under the new system will not only produce an analytical report automatically on a standard form, but will also make it possible to tailor non-standardized material for analyses.

Examples of Main Information Outputs for Analysis include:

- Transactions volume, gains and losses from derivative trades by counterparty
- Anticipates ahead of time market systemic risk through stress test results
- Assist in identifying formation of possible derivatives herd behavior
- Assist in analyzing individual companies and/or by particular issues

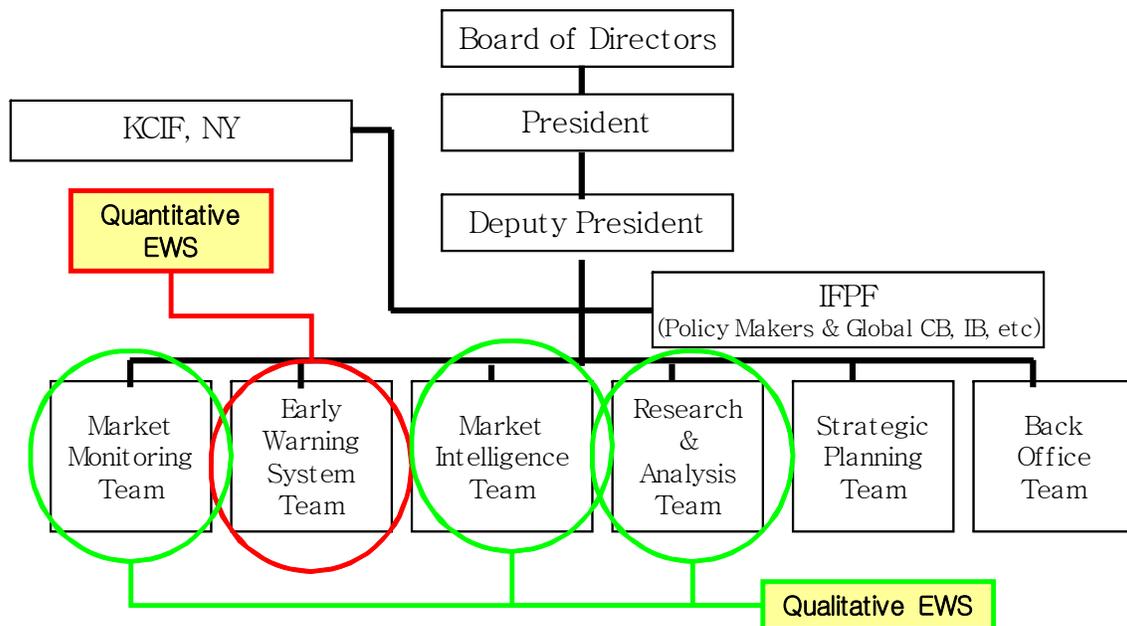
5.3 Expected Results

The completion of the new system has made it possible to closely monitor the development of derivatives market risk on a timely basis. By knowing the particular features of each transaction on a counterparty basis, the possibility of a transaction risk spreading to market systemic risk will be arrested beforehand while the degree of risk posed to market risk will be grasped by conducting stress tests and distinguishing herd behavior on particular products and counterparties. The FSS plans to actively draw on any valuable information it gathers from the new system in the future in carrying out its supervisory functions.

6. Currency Crisis Early Warning System in Korea

Risks in foreign exchange and other financial markets, energy and commodity, real estate and labor market are more and more interrelated and hence nationwide early warning system (EWS) was built in 2004 and has been in operation since then. As for the currency crisis EWS, Korea Center for International Finance (KCIF) is established on April 1, 1999 under the auspices of the Government and the Bank of Korea and began its operation. It has its own quantitative model called Fundamental-based Crisis Index Model (FCI) as well as qualitative EWS covered by three task forces including Market Monitoring Team, Market Intelligence Team and Research & Analysis Team.

<Figure> Functions of KCIF



FCI model has 4 sectors – internal real, internal financial, external real, external financial. Every month, FCI takes macroeconomic indicators as input and reports three kinds of risk indicators: composite indicator, sector indicators, and individual indicators. Composite indicator has five levels from ‘normal’ to ‘emergency’ and each level matches a specific policy action guideline.

If the FCI level indicates ‘normal’, no policy action will be needed. ‘Caution’ level triggers tighter monitoring on the cross border short-term capital flow and financial markets, domestic as well as global. Even though composite indicator stands in green zone, KCIF analyzes in depth the sector indicators and the individual indicators which trespass respective thresholds.

At the ‘Warning’ sign, monitoring function is strengthened on illegal FX transaction and higher requirement on FX liquidity soundness of financial institutions are imposed. Policy action plans are prepared on risk factors identified. Active sovereign IR is requested. If there is the ‘Quasi-emergency’ sign, contingency plans on short-term FX liquidity shortage are set off and pan-government daily checking system and crisis management entity are activated. The ‘Emergency’ level is the highest warning signal.

FCI captures primarily ‘currency crisis’. And it is very sensitive by design to all kinds of symptoms. Therefore careful examination is needed before policy action because the warning signal may be a false alarm or too volatile to be useful for practical use in high frequency.

<Table> Policy Actions Responding Each FCI Level

| FCI Level | Policy Action |
|-----------------|---|
| Normal | - |
| Caution | <ul style="list-style-type: none"> • Tighter monitoring on domestic/global market, and Cross border short term capital flow • Increase quantity & quality of information shared inside and outside of government for the risk factors identified |
| Warning | <ul style="list-style-type: none"> • Strengthen monitoring function on illegal FX transaction • Higher requirement on FX liquidity soundness of financial institutions • Prepare policy action plans on risk factors identified • Active sovereign IR |
| Quasi-emergency | <ul style="list-style-type: none"> • Prepare contingency plans on short term FX liquidity shortage • Activate pan-government daily checking system and crisis management entity • Double check SAFEGUARD trigger conditions. |
| Emergency | <ul style="list-style-type: none"> • Activate SAFEGUARD following predetermined trigger conditions |

Source: KCIF

In general a quantitative early warning model is developed for a specific type of crisis and that is why we need a qualitative monitoring system with experienced analysts. In KCIF the Market Intelligence Team monitors FX, fixed income, equity, derivatives, and commodity market. Research and Analysis Team monitors regional economies including China, Japan, EU, US, and emerging markets. New agenda or events is analyzed by the Market Monitoring Team in real time, around the clock. In particular Korea-related agenda and changes in global player's view is monitored by Global Views Monitoring Team.

V. Liquidity Pool and International Coordination

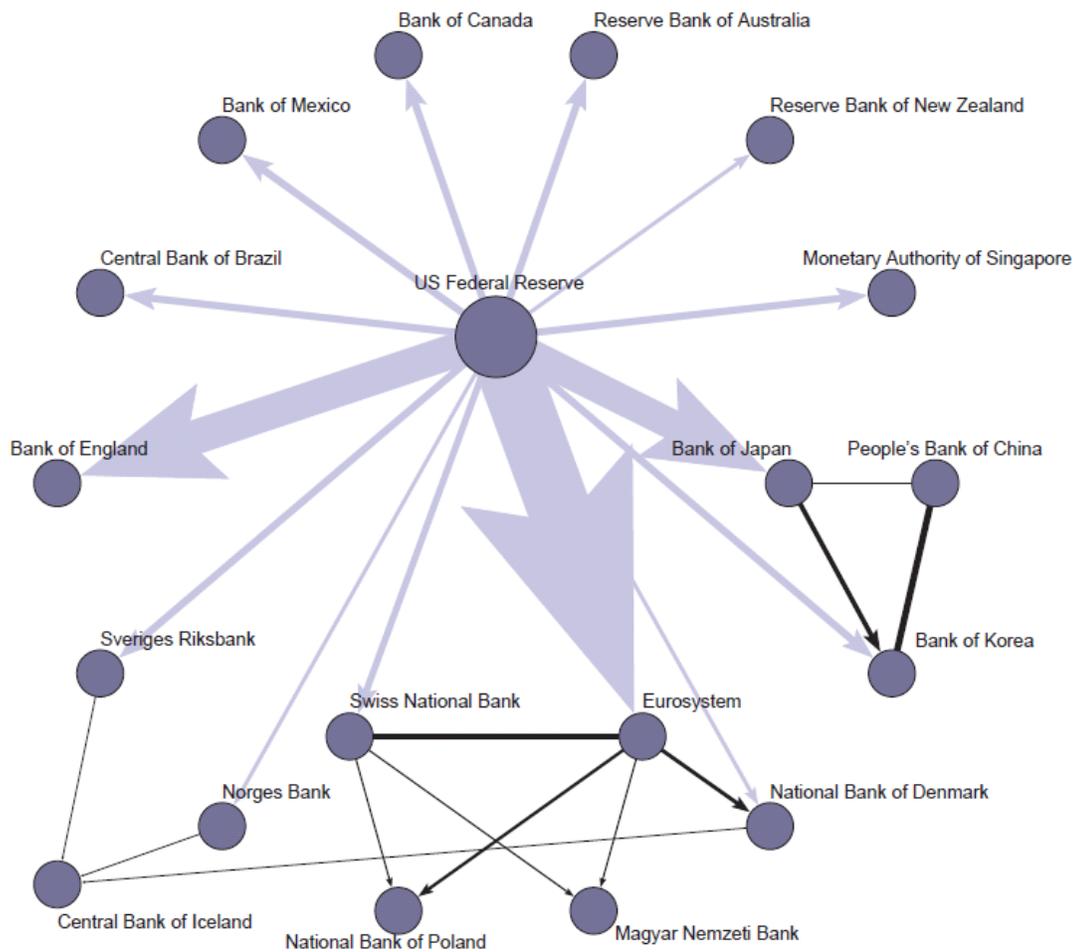
A strengthened regulation and supervision for sound liquidity risk management for banks is essentially what each emerging economy or bank can do for itself. And there are always unattractive trade-offs between ample liquidity and crisis. In addition a policy regime, however stringent, is almost always vulnerable to a collapse of confidence by domestic and foreign investors (Chang and Velasco 2001).

This means that there is much room for what is nowadays known as the *world or regional financial architecture* to help nations help themselves. The absence of an effective international lender of last resort is particularly serious. If financial crises such were at least partially caused by self-fulfilling liquidity squeezes on banks, an international lender of last resort has a positive role in overcoming a financial system's international illiquidity. Funds from abroad to prevent unnecessary credit crunches and avoid costly liquidation of investment can increase welfare,

The Chiang Mai Initiative Multilateralisation (CMIM) Agreement was signed on 28 December 2009, and it will take effect on 24 March 2010. With a total multilateral facility size of US\$120bil, it would provide financial support to participants through a network of currency swap transactions in order to address balance of payments and short-term liquidity difficulties. Participants of the Chiang Mai Initiative held more than US\$4.1 trillion of foreign exchange reserves in 2009.

The usual objection is moral hazard. But this need not be a rationale for policy paralysis. It is not wise to ban fire insurance simply because it leads some homeowners to be careless with their fireplaces. The risk can be minimized by proper contract design and appropriate monitoring. The same should be true of an international or regional lender of last resort.

<Figure> Central Bank Network of Swap Lines



Notes: The arrows indicate the direction of flows (where known); light shaded arrows represent US dollars provided to other central banks, dark arrows represent other currencies (evaluated at the average exchange rate during Q4 2008). The thickness of the arrows is proportional to the size of central bank swap lines, as announced; where swap lines are unlimited, the figure shows maximum usage instead. The ASEAN swap network is not shown.

Source: McGuire and von Peter (2009), BIS Working Papers, No 291.

<Table> Chiang Mai Initiative Multilateralisation

| Country | Contribution (bil \$) | Purchasing Multiplier |
|---|-----------------------|-----------------------|
| Brunei Darussalam | 0.03 | 5 |
| Cambodia | 0.12 | 5 |
| People's Republic of China & Hong Kong | PRC(excl. HK): 34.2 | 0.5 |
| | Hong Kong: 4.2 | 2.5 |
| Indonesia | 4.77 | 2.5 |
| Japan | 38.4 | 0.5 |
| Korea | 19.2 | 1 |
| Lao PDR | 0.03 | 5 |
| Malaysia | 4.77 | 2.5 |
| Myanmar | 0.06 | 5 |
| Philippines | 3.68 | 2.5 |
| Singapore | 4.77 | 2.5 |
| Thailand | 4.77 | 2.5 |
| Vietnam | 1.00 | 5 |

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