

**A New Macro-Financial System
for a Stable and Crisis-resilient Growth in Korea**

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1. Introduction

The 1997 crisis had shown a typical crisis occurred at developing countries: Korea suffered balance of payment deficits and insufficient international reserves prior to the crisis. But, recovering from the 1997 crisis, in 2008 Korea was at the verge of entering to the advanced economies. The Korean economy successfully recovered from the 1997 crises and its per capita GDP exceeded US \$ 20,000. During the first half of 2000s, its potential growth rate had been 1-2 % higher than that of OECD average, its unemployment rate had been 1-2% lower than that of OECD average, it had shown successive current account surplus from 2003-2007, and its international reserve had reached over 200 billion dollars (world 6th in size).

Nevertheless the Korean economy had suffered again serious financial crisis associated with the 2007-8 subprime crisis in the US, and revealed its weakness to international financial crisis; during 2008 there were the huge capital outflows (US \$ 50billion-about 5% of GDP) and the exchange rate plummeted. Then there remain the following question: why the Korean economy revealed the developing country type instability and weakness in spite of its advanced country type macroeconomic performances? How can the Korean economy establish a crisis-resilient macro-financial system?

These are the main issues that this paper plans to address. This paper addresses this question with a recognition addressed in UNCTAD and UN reports (UNCTA 2009; UN Commission 2009) that the current situation after the global financial crisis requires a new perspective and paradigm on economic policy for dynamic emerging economies like Korea. We recognize that establishing a crisis-resilient macroeconomic system is the final step for Korea to advance into the status of rich countries, and, more importantly, that just opening and liberalizing capital markets to a fullest scale does not bring Korea into that status. It requires more careful policy initiatives, given currently more volatile and uncertain global economic environment.

Actually, global financial crisis since 2008 is another important factor that pushes Korea and Asian economy to seek a new mechanism to run an economy. Asian economies pursued an export-oriented growth model that relies on the USA for market. However, as the American economy suffered a lot, with a loss in asset value of about 15 to 20 trillion amounting to 1.5 times of the US GDP, the US economy is expected to reduce consumption, stopping serving as the consumer market for world. Thus, Asian economies are seeking a new growth forces from domestic markets, which seems inevitable if they are going to advance into a decent rich country status. Here comes the dilemma. A domestic market-based growth has

always the peril of decreasing foreign exchange earnings and the associated risk of balance-of-payment crisis. So, turning into a new growth mechanism requires an “external safety net” against possible foreign exchange liquidity crisis.

As a theoretical framework, we find useful a structuralist macroeconomics perspective developed by Taylor (1998) and others, such as (Eatwell and Taylor, 2000). A key idea is that the operation of the financial market, especially that of the international capital market fits into *the beauty contest* of Keynes (1936) rather than the efficient market. Thus, market failures arising from asymmetric information, incompleteness of contingent markets, and bounded rationality (not to mention irrationality) are endemic to financial markets. The market is likely to be highly unstable and prone to occasional severe loss of liquidity as all opinion shifts in the same direction (Eatwell and Taylor 2000). Then, a key concept explaining crisis in emerging economies is the so-called ‘Frenkel-Neftci’ cycle (Taylor 1998). This cycle rests on two kinds of expected spread, interest spread and capital gain spreads that initially motivates foreign capital coming into emerging economies. If spreads open meaning possibility for proofing making, then local players take positions in the relevant assets, borrowing abroad, and foreigners also invest at the domestic assets. But, any movement threatening the overall position, that is, sudden change in expected return such as exchange rate devaluation, real estate price collapse, and/or stock market crash can result in huge capital outflows in a very short period and currency crisis.

This paper will discuss this framework and interpret the two crises in Korea from this perspective in section 2. Then, section 3 discusses macro-level policy issues to maintain macro-stability, and the focus will be on capital account management (capital controls) and alternative exchange rate systems. Then the remaining two sections of 4 and 5 are about microeconomic issues. In other words, section 4 explores the micro-level sources for macro-instability, with focus on foreign exchange markets. Korean economic crises have been always closely related to foreign exchange (FX) markets. It implies that systemic risk of Korean economy either comes directly from FX channel or is aggravated due to the disturbance in FX market. This is why Korean economic crises have had the forms of currency liquidity crisis and why we have to pay our attention to foreign exchange market in a microeconomic perspective. Then, section 5 discusses micro-level policy reform issues. Section 6 concludes the paper with a summary and concluding remarks.

2. Theoretical Framework and Interpreting the Crises

1) Structural macroeconomics perspective

Last three decades we have seen the era of the (financial) globalization. After the demise of the Bretton Woods system, the world economy has moved toward liberalization and deregulation. This movement was endorsed by the belief that the financial market including the international capital market operates efficiently. Eichengreen (1999) well summarizes this idea: “There are clear benefits from being able to borrow internationally. Capital mobility creates valuable opportunity for portfolio diversification, risk sharing, and intertemporal trade. By holding claims on foreign countries, households and firms can protect themselves against the effects of disturbances that impinge on the home country alone. Entrepreneurs can pursue high-return domestic investment projects even when domestic finance is lacking. Capital mobility can therefore enable investors achieve higher rates of return. And, higher rates of return can encourage saving and investment, ultimately supporting faster rates of growth.”

However, financial market operation is different from this belief. Market failures arising from asymmetric information, incompleteness of contingent markets, and bounded rationality (not to mention irrationality) are endemic to financial markets. The operation of the financial market, especially that of the international capital market fits into *the beauty contest* of Keynes (1936) rather than the efficient market. That is, the market follows what average opinion believes average opinion to be. A market that operates as a beauty contest is likely to be highly unstable and prone to occasional severe loss of liquidity as all opinion shifts in the same direction. (Eatwell and Taylor, 2000). Therefore prudent regulation is absolutely necessary for the stable economy. According to this view, whenever the government retreats from its role of regulating the financial markets including the international capital market, there come the possibilities of financial and/or currency crisis, especially for the developing countries.

Based on this idea, Taylor (1998) proposed the ‘Frenkel-Neftci’ cycle. According to this view, the currency crisis pivoted around the government’s withdrawal from regulating the real side of the economy, the financial sector, and especially the international capital market. This premeditated laxity created strong incentives for destabilizing private sector financial behavior, on the part of both domestic and external players. Feedbacks of their actions to the macroeconomic level upset the system.

Let us examine the discussion of Taylor (1998). Taylor proposed that the capital inflows occurs as a interest rate spread (\sum_i)and/or a capital gain spread (\sum_Q) opens due to lax public sector regulation such as financial liberalization. The

definitions of spreads are as follows;

$$\sum_i = i - [i^* + (\Delta e / e)^E] \quad (I)$$

$$\sum_Q = (\Delta Q / Q)^E - [i^* + (\Delta e / e)^E] \quad (C)$$

Where (I) stands for the interest spread equation and (C) stands for the capital gain spread equation. In the equation, i stands for the domestic interest rate; i^* stands for the foreign interest rate; e stands for the exchange rate; Δ stands for the changes of the variables; Q is the relevant asset price; and the superscript E represent the expectation. If spreads open, then a few local players take positions in the relevant assets, borrowing abroad or foreigners investing at the domestic assets. Their exposure is risky but small. In this stage, risk for the system as a whole is negligible.

In the second stage, the destabilizing market competition is induced. If some players are exploiting those spreads, the other players can hardly resist engaging in that business, even though they are aware of the risks. After some time of this process, the balance sheet of financial system will be risky overall, that is, short on foreign currency and long on local asset. That means that individual players' risks have now been shifted to the economy as a whole. Then any movement threatening the overall position, that is, sudden change in expected return such as exchange rate devaluation, real estate price collapse, and/or stock market crash can result in huge capital outflows in a very short period and currency crisis.

Other currency crisis models mainly emphasize the role of government policy measures which cannot be sustained by fundamentals and in the end lead to an abrupt change of condition or crisis. That is, in these models, financial and currency crises are caused by an alert private sector pouncing upon the public sector's foolish actions such as running an unsustainable fiscal deficit or creating moral hazard. Also, these models need a regime shift when a spread \sum_I or \sum_Q switches sign from positive to negative. However, in a Taylor model, movements in the spread itself feed back into cyclical changes within the economy concerned that finally lead to massive instability of the system, as described before.

2) Interpreting the Two Crises in Korea

Comparing two episodes of currency crisis in Korea (one is that of 1997 and the other is that of 2008), we noticed the fact that even though Korea is at the different stages of economic development, the currency crisis can be explained by the same analytic framework a la Taylor (1998). We cannot attribute two episodes

to either wrong policy measures or moral hazard. Even though, there is some possibility of moral hazard in 1998 as stated in a Taylor (1998), it was not main source of crisis and there was no fiscal profligacy problem at all, which is one of main culprit for the main stream crisis model in either episode. In our view, Taylor model provides more succinct, plausible and realistic historical accounts.

Taylor (1998) provides the detailed accounts on how the Korean economy with relatively sound fundamentals fell into the debacle of the 1997 crisis. It emphasizes government's deregulation both in the real side of economy (retreat from its traditional role of coordinating investments in large-scale industries) and financial sector (failures in monitoring foreign borrowing, especially by newly licensed merchant banks and derivatives). With the financial liberalization, there had been the huge capital inflows such as Yen carry trade as the spreads opened. Inexperienced Korean financial intermediaries made some fatal mistakes while engaging in the international capital markets with little regulation; maturity mismatch problem, currency mismatch problem and dealing unaccustomed products (derivatives). With other bad lucks, the crisis in the Southeast Asia changed investors' expectation, and thus brought the run against the Won.

The Korean crisis of 2008 can be explained with the same analytic framework like that of the 1997 crisis. This time spreads opened due to, first, high interest rate policy by the Korean government aimed to suppress real estate price increase, and, second, the expectation about exchange rate appreciation, and thirdly stock market returns after recovering the crisis. Then the subprime crises produced the sudden change of expectation of the market participants. The credit crunch in the international capital markets, and the possibility of exchange rate depreciation by the Korean government to promote exports, lead to the huge capital outflows. Some details on this follows.

Even though the capital account liberalization was one of main reasons leading to the currency crisis, the IMF and the Korean government pursued a greater liberalization. In November 1997, the Korean government fully liberalized capital inflows. In April 1999, regulations on capital account transaction were converted into a negative system, abolishing the *bona fide* principle for foreign exchange transaction authorization. Also, regulation on foreign exchange institution for engaging in foreign exchange activity was revised from licensing to registration system. In January 2001, OTC securities transaction between resident and non-residents were liberalized.

Strong macroeconomic performance with those measures again opened spreads, and pulled foreign capital inflows into Korea. The scale of aggregate capital inflows rose steadily, and amounted to 6.1% and 7.4% of GDP in 2006 and 2007

respectively. Since the Asian currency crisis, Korea has enjoyed sizable current account surpluses. As both the current and capital account posted continuing surpluses, oversupply in the forex market intensified, leading to a substantial increase in foreign reserves and appreciation of the Won for a prolonged period. Foreign reserves of Korea amounted to 262 billion dollars at the end of 2007. Various researches report that a surge in foreign bond investment inflows was due to widening of the covered interest differential except the period of financial turmoil resulting from the subprime crisis. (Kim, Kim and Suh 2009; Kim and Song 2007; Park and Kim 2008; Yang and Lee 2008, Ryou and Park 2008; Lee 2006). Foreign equity investment flows also gradually increased up until the second half of 2007. In 2007 the outstanding foreign equity investment amounted to 320 billion dollars. According to Yoon and Bae (2007), these flows increased when the expected returns increase due to forward stock price index increase and forward exchange rate appreciation in offshore NDF markets and widening of domestic and foreign interest rate differential.

Meanwhile, the Korean government encouraged capital outflows to facilitate appreciation pressure in 2006 and 2007. Accordingly, residents' investment in overseas real estate, after standing at a mere 22 million USD in 2005, increased to 1.3 billion in 2006 and 2.7 billion in 2007. Overseas equity investment also rose substantially, from 11 billion in 2005 to 24 billion in 2006, and 50 billion in 2007. Because the Won is not an international key currency, to avoid exchange rate risk, investors sold forward exchange on a large scale, leading to a considerable increase in overseas foreign currency borrowing. In addition, exporters, mainly shipbuilders, hedged their exchange rate risks by selling forward exchange contracts for their coming export revenues. Domestic banks which buy these forward exchange contracts have to adjust their foreign currency position by selling foreign currency in the spot market. They got the needed foreign currency via currency swap contracts and foreign exchange swap contracts with foreign bank branches or foreign investors who wanted to exploit the arbitrage opportunities by investing in the Korean bonds. As a result, we can see the surge of Korea's external debt, especially that of short term debt since 2006.

The international financial catastrophe as a consequence of the subprime crisis since the second half of 2007 had lead to the credit crunch in the international capital market, and thus affected the Korean economy. Considerable foreign capital outflows from Korea had continued and brought the collapse of stock prices and the values of the Won. Crisis stricken foreign investors trying to make up the liquidity preparing for the credit crunch sold a large sum of equity holdings. In addition, foreign investor called off derivatives contracts, such as foreign currency

swap contracts and foreign exchange swap contracts and did not roll over those contracts with domestic banks. What made the situation worse was the existence of the considerable amount of external debt (380 billions of US dollars in 2007 and in 2008), which left doubts on the ability of the Korean authority to handle the crisis situation. All of these, in turn, lead to the collapse of stock prices and huge depreciation of the Won, and to increase in volatility and instability of the domestic financial and foreign exchange market.

3) Proposing a new macroeconomic policy framework

From the analysis of two episodes of Korean currency crisis, we are going to investigate the following inquiry: What is to be done to prevent the future crisis from the point of macroeconomic policy makers?

It is now recognized that the ‘Frenkel-Neftci’ cycle start with the government’s retreat from the regulation in the international capital market. Therefore, to prevent the future crisis, the sound regulation and supervision is necessary. And, recent crisis experiences demonstrate the sound regulation and supervision in one country is not sufficient in the era of globalization. Without coordinated international assistance, it is not possible to achieve the desirable results. With regard to the sound regulation issues, we need to extend the scope of regulation from monitoring capital adequacy to the asset management of the individual financial intermediaries, including off-balance sheet activities such as derivatives contracts. Not only TRS (Total Return Swap used in 1997 in the Korean case) but also MBS, CDO used in recent subprime case clearly demonstrate the potential risks inherent in these financial goods. This issue will be discussed later in section 5 with detailed reform measures suggested.

Then, the main issue in terms of macroeconomic policy is to pay attention to the movements of spreads, because wide-open spreads can pull in the capital inflows that can be extremely destabilizing. As Taylor (1998) points out, another source of spreads is through off-balance sheet activities and derivatives. Here we must thoroughly investigate the experience of long lasting arbitrage opportunity in the Korean economy. As we have already examined, these arbitrage opportunities are exploited by foreign bank branches and foreign investors, which finally led to the surge of external debts and contribute to the instability of the Korean FX market when the subprime crisis hit the international capital markets. As Yang and Lee (2008), Ryou and Park (2008), and Kim and Song (2007) point out, these arbitrage opportunities resulted from the systematic imbalance between supply and demand in the domestic forward exchange markets (and disequilibrium in swap market due to

difficulties of domestic foreign exchange banks to acquire foreign exchange in the global credit crunch situation). The Korean authority should have tried harder to correct this systematic imbalance, considering the potential risks of sudden withdrawal.

Let us examine the movements of spreads more thoroughly. External conditions affecting the movements such as weak dollars after the collapse of the IT bubble and low foreign interest rate are relatively out of the Korean authority's reach. The won/dollar exchange rate showed continuously appreciating trend before the second half of 2007 except the year of 2001 and 2002. Thus relatively affordable policy measure remaining in the hands of Korean authority was the domestic interest rate. Even though domestic interest rate was considerably lower than that in before the 1997 crisis period, it was higher than foreign interest rate except during very short periods (Yoon and Bae 2007). Hence, exchange rate appreciation together with interest rate differential opened the long lasting spreads. However, it seemed that the Korean authority had severe constraints in lowering the domestic interest rate for reducing spreads due to the stock market boom and real estate price increase. The housing price, especially the price of the apartment in Seoul had started to increase considerably from the year of 2000 and continued in the Roh government era in spite of various policy measures only except very short periods (Kang 2006; Kim 2007; Kim 2008). The Roh government had had tried to contain the housing price increase so that the lowering the interest rate might not be plausible option for them. The stock market boom starting from the early 2003 might add difficulties in this situation.

The next issue is how to manage exchange rates in overall macroeconomic policy. It is often argued in the main stream economics that fully floating exchange rate system and capital account convertibility could isolate a country from speculative attacks, as that government has no commitment with *any* level of exchange rate. They prefer to that combination to the problem of 'the impossible trinity', which states that a country cannot have stable exchange rate, capital account convertibility, and autonomous monetary policy simultaneously. According to this view, for an emerging country open to a substantial volume of capital flows, a flexible exchange rate (1) reduces the sources of external vulnerability and (2) increase the efficiency of monetary policy, and at the same time financial liberalization (1) efficiently allocates savings, (2) discipline macroeconomic policies, and, consequently (3) improves economic growth (Ferrari-Filho and Paula 2008-2009). But, as Grenville (2000) clearly shows, the general experience demonstrate (1) fundamentals cannot explain the behavior of the exchange rate over a short/medium-term horizon, and (2) exchange rates have at times exhibited long-lived swings, with

no apparent changes in fundamentals significant enough to justify them. In addition, not any country can bear any level of exchange rate and considerable volatility in the foreign exchange market, which could have real economic consequences devastating for particular sectors and whole economies. As the Korean economy relies greatly on trade performance and on imports for needed materials such as oil, it is virtually impossible for the authority not to manage the exchange rate at all. The following example of the Korean authority is very suggestive of inability to implement policy in a liberalized world. As we have already seen, the Korean government encouraged capital outflows to alleviate the pressure on the exchange rate appreciation. Indeed, capital outflows increased substantially, but capital inflows due to hedging demands also increased markedly, nullifying the intent of the authority.

What kinds of macro policy framework should be sought for Korea to prevent excessive exchange rate fluctuations and achieve macroeconomic stability represented by price stability and full employment? One of the corner solutions to the impossible trinity, namely the combination of free floating exchange rate system with autonomous macroeconomic policy and full capital accountability, cannot be the one for the above mentioned reasons. That is, first, Korea heavily depends on trades (both imports and exports) and, second, capital flows and the exchange rate can be extremely volatile. And, we cannot exclude autonomous policy measures because even a partial autonomy means a lot for emerging economies (Malovic 2007). As Williamson (1999) states, although we cannot simultaneously fully liberalize capital flows and retain both absolutely fixed exchange rate as well as absolutely independent monetary policy, nobody has ever said one could not partially control capital flows, and retain reasonably flexible currency rate and relative independence in monetary policy making.

Flexible BBC (basket, band, crawl) exchange rate system can be plausible alternative for those purposes. The ingredients of that system can be summarized as follows: a basket (of currency is pegged against), a band within which its floating is limited, and a crawl according to inflation differentials or other pre-specified fundamentals (Marcovic 2007, Wang 2008). However, in order to enhance the possibility of successful management of exchange rate system, some measures are necessary to reduce volatility of capital flows and likelihood of speculative attacks on domestic currency (Ferrari-Filho and Paula 2008-2009). The use of official intervention requires substantial stocks of foreign reserves for avoiding speculative attacks and the use of sterilized intervention for mitigating pressure of appreciation. As recent experience of the Bank of Korea clearly shows, using sterilization policy for the long time produces some concerns such as deterioration of the balance sheet

of the Bank of Korea and additional capital inflows via increase in domestic interest rate and so on (Kim, Kim and Suh 2009).

Therefore it must be supplemented by capital account management techniques, that is, capital controls. Capital controls can reduce the vulnerability of a country to financial crisis, including capital flight during any currency crisis, and drive a wedge between onshore and offshore interest rates in order to provide monetary authority with some policy autonomy at least in the short run, and reduce exchange rate pressures derived from excessive capital inflows (Ferrari-Filho and Paula 2008-2009). At least capital controls on inflows did some work according to Magdud and Reinhart (2006). UNCTAD reports (2009) further recognizes the role of capital account management, saying that capital account can be managed in a counter-cyclical manner, by restricting the build-up of excessive financial liabilities in good times and restraining capital flight during crises.

In sum, a new macro policy framework we are suggesting can be described as “an intermediate system” with partial capital control, a flexible BBC (basket, band, crawl) exchange rate system and relative independence in monetary policy making.

3. Macro-level Reform Issues for Stability

1) Different views on international capital flows

The main driver of changing international economic environment since the late 1980s is the large amount of capital flows. The ratio of sum of foreign assets and liabilities to world GDP increased from 0.86 in 1985 to 2.64 in 2003 (2003 (Lane, Philip R. and Gian Maria Milesi-Ferretti(2007)). In particular, the degree of capital opening has been higher than trade opening in most countries since the mid 1980s. Also in Korea, the ratio of foreign assets and liabilities to GDP increase from 0.60 in 1997 to 1.09 in 2004.

The large capital flows were spurred by capital market liberalization. The measures for increasing capital opening are derived from the faith in the efficacy and virtue of an open capital account. That is, it is recognized that capital opening contributes to enhanced efficiency in resource allocation, investment, competition and economic growth. These recognitions drive most countries to pursue financial liberalization including domestic financial deregulation and opening of capital account. The financial liberalization lets capital market of most countries open.

However, advanced countries as well as developing countries have encountered serious financial and economic crises more frequently after the financial opening. Large and frequent capital flows, in particular, short term capital flows, have made economies highly vulnerable to foreign shocks. The capital account opening supporting groups argue that the economic crises are derived from fundamental weakness and deficiency in the prerequisites for financial opening such as prudential regulation and disciplined domestic policy. Recently, the global financial crises that stemmed from sub-prime mortgage crises in the United States make us doubt that the lack of institution and precondition for financial opening is the cause of crises because it was sweeping across more advanced economies in the West.

There is large volume of economic literature to examine the effects of capital market liberalization on the economy. We can categorize the literature by two groups. One is to support and put focus on the benefits of capital market opening. The other is to criticize the capital market opening, putting emphasis on its higher vulnerability of economy.

The first view is supported by Rogoff(1999), Fisher(1988), Summers(2000), Kose, Prasad, Rogoff and Wei(2006). The main reasons for arguing for capital market liberalization are summarized.

- higher investment owing to lower cost of capital
- enhancement of the resource allocation
- more rapid productivity growth and economic growth
- welfare improvement by consumption smoothing over time

Also empirical evidences are suggested by Quinn(1997), Klein and Olivei(1999) and Edwards(2001). They shows that capital account opening enhances economic growth

Now, take a look at the other side view against capital market liberalization. We can take as representative arguments Bhagwati(1998), Rodrik(1998), Stiglitz(2000), Rodrik and Subramanian(2008). They put emphasis on effects of capital market liberalization on the financial instability and economic vulnerability to shocks. Also Grilli and Milesi-Ferretti(1995), Rodrik(1998), Kraay(1998), O'Donnell and Dublin(2001), Edison, Leine, Ricci and Slock(2002) do not find the evidences that capital account convertibility increases the economic growth. Furthermore, the free capital mobility across countries contributes to financial and economic crises. The logic for argument against international capital flows include the followings: asymmetric information; assets pricing with bubbles; maturity and currency mismatch incurring a serious bank run and financial panic owing to no international

lender of last resort. They argue that trades in assets are different from the trades in goods and services. The international capital flows enhance the vulnerability of economies to foreign shocks, not leading to economic efficiency and growth. Rather the international capital flows frequently incur the economic and financial crises.

As above examined, the theoretical and empirical literature does not reach a consensus on the relationship between capital opening and economic growth. As Kose et al (2006) conclude, as a whole, the vast empirical literature provides little robust evidence of a causal relationship between financial integration and growth. Also, there a strong correlation between capital mobility and financial crisis as shown by Epstein (2009). Also as Eichengreen (2001) notes, the capital account liberalization remains one of the most controversial and least understood policies of our day.

The arguments against the international capital flows suggest that the capital controls or government interventions in capital flows are at least the second best, though not the first best one under the current circumstances.

The recently frequent crises let the policy makers and academic economists more seriously reflect the benefits of capital account opening and pay attention to the cost of capital account convertibility (UNCTAD 2009).

Still, there is deep skepticism about capital controls. In particular, IMF and The World Bank which drove international financial opening, hesitate to accept the necessity of capital controls, arguing that capital controls are not effective especially in the long run, and could not be a substitute for the required adjustment in a macroeconomic and exchange rate policies.

2) International capital flows and financial crises

The frequent currency crises and banking crises since the late 1980s lead one to the belief that capital account liberalization raises the risk of financial instability. The relaxation of capital control in Europe following the implementation of the Single European Act of 1990s accompanied the European Crises 1992. Mexico (1994) was attacked by volatile international capital flows, following the liberalized capital markets. Measures for capital account liberalization of East Asian countries in the early 1990s exposed those countries to speculative attacks and finally serious financial and economic crises in 1997. As Stiglitz (2000) and Rodrik(1998) note, China and India which closed the capital market from international markets, succeeded in insulating those from financial crises. These case events

lead us to believe that capital account liberalization has an important role in causing financial crises.

Stiglitz (2000) argues that the recent frequently crises are basically originated from the capital market liberalization (opening), comparing crises to car accidents as follows: “When there is a single accident on a highway, one suspects that driver’s attention may have lapses. But when there are dozens of accidents at the same bend in the same way highway, one needs to re-examine the design of the road”.

Rodrik (1988) also blames the international capital flows, arguing that capital account convertibility requires the painful economic adjustment in the face of external shocks unrelated with any change in circumstances like boom-and bust cycle in East Asia crises. He argues that it is tempting one to think of capital account liberalization as the natural follow-up to the establishment of capital account convertibility. If the international trade is beneficial, why not international capital flows? He answers to the raised questions as follows: The markets for goods and services are fundamentally different from financial and capital markets in the sense that the financial and capital markets have more asymmetric information and higher speed of adjustment than markets for goods and services. And as there is no international lender of last resorts, capital open economy is vulnerable to small shocks.

But there is little systematic empirical evidence to support the views that capital market liberalization by itself increases vulnerability to crises. Glick et al(2006) show, sample biases led to conclusion that country with free international capital flows are more vulnerable to financial crises. Fairly saying, it remains unknown that international capital flow is the most important cause for financial crises.

However, as Kindleberger (1984) notes, the financial markets are prone to herding, panics, contagion and boom bust cycles. It is true that that appropriate macroeconomic policies and sound economic conditions reduce the possibility of crises but cannot eliminate them. In other words, the unfavorable economic conditions and inappropriate policies which are combined with international capital flows tend to increase the vulnerability to crises. The recent UNCTAD report (2009) also observes that assertion that capital controls are ineffective or harmful have been disproved by the actual experiences of emerging economies. At least, there seem to be a consensus that short term capital movements cause more costs than benefits. Especially, the short term capital movements, so called, hot money, which are volatile and

easily reversible, causes tumbling stock prices, soaring foreign exchange rates, and credit contraction. Therefore, short term capital flows are concern to policy makers. Although it is not easy to design effective policy instruments for handling short term capital, the control short term capital flows should be managed.

Reinhart and Rogoff (2009) find that costs of financial crises are very large. They calculate that on a peak-to-trough basis, real housing price declines average 35 percent stretched out over six years, while equity price collapses average 55 percent over a downturn of about three and a half years. Banking crises are associated with profound declines in output and employment. The unemployment rates rise an average of 7 percentage points over the down phase of the cycle, which lasts on average over four years. Output fall an average of over 9 percent. The calculated large costs of financial crises lead the policy makers to make policy making in a safe or conservative way.

Here we take a casual look at the recent capital flows in Korea. As the Figure 1 shows the capital flows are volatile. In 2007, net capital inflows into Korea, amount to U.S. dollar 9.5 billions. In 2008 capital flows were reversed from net inflows to outflows. Amount of net capital outflows was U.S. dollar 50.9 in 2008 with the peak U.S. dollar 42.5 during the 4th quarter 2008 when the sub-prime mortgage crises in the U. S. spread to the globe. It is calculated that the capital flow reversals amount to U.S. dollar 60.4 during the period of 2007-2008. In 2nd quarter, 2009, the capital flows were again reversed into net capital inflows. As Table I indicates, during the 2nd quarter in 2009, the capital inflows dominate the capital outflows. Such high volatility of capital flows which Korea experienced recently, lead us to cast doubt on the argument that capital flows generate positive effects on economy by enhancing the resource allocation and investment.

Table 1 . Trend of capital Flows in Korea (2007:I-2009:II): Unit: U.S Million Dollar

	I	II	III	IV	Total (Annual)
2007	7,177.9	9,631.0	-3,749.7	-3,543.4	9,515.8
2008	633.5	-4,440.7	-4,631.1	-42,456.4	-50,894.7
2009	-1,273.7	8,598.9			7,325.2

Data: BOK ECOS

<Figure 1> The trend of capital flows in Korea (units: millions U.S. dollar)



Data: BOK ECOS

3) Policy options for capital account management (capital controls)

Though the capital controls are not the first best policy, it could be one of policy options for preventing crisis. Actually, the volatile international financial turmoil cannot be isolated from capital open economy. In particular, the small open economy like Korea, are faced with capital inflows and outflows under the current circumstances with unfettered capital flows. Therefore, capital controls are thought of as a policy option, especially regarding short term capital.

Epstein, Grabel and Jomo (2003) examine the case of countries with close capital account. They draw the important and attention worthy lessons as follows.

Firstly, capital management techniques (capital control) can enhance overall financial and currency stability, buttress the autonomy of macro and micro-economic policy, and bias investment toward the long-term. Secondly, the macroeconomic benefits of capital management techniques probably outweigh their microeconomic costs. Thirdly, the nimble, dynamic application of capital management techniques is an important component of policy success.

Fourthly, controls over international capital flows and prudential domestic financial regulation often function as complementary policy tools, and these tools can be useful to policymakers over the long run.

As Epstein, Grabel and Jomo(2003) note, there is no single type of capital account management technique that works best for all developing countries. Therefore, Korea needs to explore its own policy options for capital controls, among which we can select and exploit the

measures appropriate to circumstances.

Before proposing the concrete measures for capital control, several points need to be reminded. First of all, capital controls have to aim at managing short term capital flows, not long term capital like green field FDI. Second, the cost of capital inflows controls is evaluated to be less than the costs of capital outflow control. Abrupt introductions of capital outflows control would be a big damage to a country's credibility. It is global standard that the lawfully flowed-in capitals are permitted to outflow, except in the rarely exceptional cases. Third, price-based capital control is preferable to quantity based one. Finally the capital controls need to be well organized to attain the intended policy goals.

There are several measures for capital controls such as Tobin tax, reserve requirement on flows, residence requirement, etc (Epstein 2003)). Now let us propose Tobin tax and reserve requirement as feasible measures for capital controls in Korea.

The Tobin tax is the first candidate for capital control in Korea. As is well known, the Tobin tax impose a small tax on all foreign exchange transactions, thereby discouraging the buying and selling of foreign exchange for very short term purpose with speculative motives. The Tobin tax impede the short term capital flows because the tax is imposed by each exchange transaction, while the Tobin tax does not give burden to long term capital movement which is accepted to be favorable to economy. This means that the cost of the Tobin tax might be negligible, but attains the originated purposes for deterring the short term capital flows.

The view on the Tobin tax gets more favorable after the global financial crisis across the globe. Brazil has already adopted the financial transaction tax on foreign purchase of stock and equity (2% of purchases amount). Also the EU organized the specialist research committee to study on how to adopt the tax on international capital flows, considering the tax rate of 0.005%. In December 2009, the EU summit meeting recommended the IMF to promote international adoption of the Tobin tax. These should be taken a significant change in the attitudes toward Tobin tax, as the advanced countries have been negative toward the tax.

Secondly, some reserve requirement could be introduced. This policy requires foreign investor to place some of the fund in a bank for a period of time. This policy works like a tax. As the fund can be used for the investment after a specified period of time, the long run capitals are not hindered to flow.

The other capital controls seems to be inappropriate because those are based on quantity based ones, thereby incurring higher costs

4) Reform in Exchange rate systems

Nowadays most of advanced countries adopt a floating exchange rate system. But a floating exchange rate system is not uniform. Actually there are various floating exchange rate systems depending on the degree of government intervention in the exchange market. Even **advanced countries** frequently intervene in exchange markets in order to maintain desirable level or stability of the exchange rate with varying degree of intervention.

Korea adopted a free floating exchange rate system in the middle of the financial crisis 1997 to prevent the speculative attack against Korea won. It should be noted that IMF pushed Korea to adopt a freely floating exchange rate system as a part of the conditionality for the bailout. At that time, Korea was not in a position of investigating which exchange rate system is appropriate for the Korean Economy, **as** the top priority was on the escaping from the national default situation at that time. Now it is high time for reexamine the exchange rate system in Korea, **taking** into considerations the changing international financial environment and the Korean Economy.

Economists do not have a consensus on which exchange rate system is better, between fixed and floating one. Arguments for fixed exchange rate systems put emphasis on the benefits of stable exchange rate. They state that the fixed exchange rate system reduces the exchange risks associated international trade and promote international trade transaction, contributing to economic growth. In contrast, the arguments for floating exchange systems are based on the view on the advantages of market efficiency in resource allocation. Also they assume that the floating exchange rate systems deal better with external imbalances. The fact that many advanced countries adopt a floating exchange rate arrangement, might imply that benefits of floating exchange rate systems are bigger than those of fixed exchange rate systems in the advanced countries.

But, the benefits of floating exchange rate arrangements are based on the assumption that exchange rates are determined by the “real” fundamentals. However, there are many evidences to show that the exchange rate are frequently determined not by economic fundamentals, but by volatile capital flows or herding. Therefore the exchange rate are excessively volatile and in disequilibrium level. It is also acknowledged that the market mechanisms are working only in the stable environment and by signaling effects. The volatile fluctuation of exchange rate increases only the uncertainty and risks, not enhancing the resources allocations.

Korea Won has experienced excessively volatile fluctuation. Let's take a look at the recent fluctuations of Korea won exchange rate. As the figure shows, the exchange rate of Korea Won against U.S dollars changed from 920s in August 2007 to around 1,590 in March 2009. The Korean Won depreciated by up to 60% with regard to U.S dollar after the start of U.S sub prime mortgage crises. It is evaluated the Korea Won depreciated most significantly among competing countries like Taiwan and Singapore. The excessive volatility of Korea Won exchange rate leads policy makers and academic economist to re-consider the strength and weakness of the current exchange rate systems.

<Figure 2> The trend of Korean won exchange rate against U.S dollar



Data: BOK ECOS

As is well known, Korea is a typical small open economy whose trade openness amounts to almost 80%. The characteristic that the Korean economy is a typical small open economy indicates that the exchange rate plays a crucial role in running the economy. In general, a small open economy enjoys the benefits of floating exchange rate system in the sense that a floating system has advantage in insulating the economy from foreign shocks. However, the experience during 2008 and 2009 of volatile movement of the rates indicates that that was not the case.

Thus we are proposing flexible BBC (basket, band, crawl) exchange rate system, the

intermediate exchange rate system between the fixed and floating exchange rate system for Korean economy. The flexible BBC means that exchange rate is permitted to fluctuate within band, while government intervenes in exchange market if it reaches to certain level. Running the pegged within band requires an amount of foreign exchange reserves large enough (but not an extremely large) to generate confidences in the exchange systems to market, thereby preventing speculative attack. It is reported that the Bank of Korea holds the international foreign reserves which amounts to above U.S dollar 250 billion. Though we need a further examination about how large the required amounts of international reserves are to maintain the pegged exchange rate system within band, it is high time to consider seriously adopting the PBC. Also the pegged within band exchange rate system might be more effective and feasible with the controls over the short term capital flows.

However, there could be many arguments against the pegged band exchange rate system. The main points of arguments against the pegged within band exchange rate system are summarized as follows; First, the band might be established arbitrarily or not reflect the changing economic environment; Second, the pegged exchange rate requires large amounts of international reserve; Third, the pegged band exchange rate system might be vulnerable to speculative attack, in particular, in the case of inappropriate macroeconomic policy. However, it is still not established that the cost of the PBC system is bigger than that of free floating exchange rate, when we consider the additional benefit of obtaining more autonomous scope for monetary policy. The flexible BBC seems to be a feasible and desirable system for Korea, as it keeps the exchange rate stable and allow more scope for monetary policy.

As an alternative to one-country level exchange rate system, we can also consider the option of multi-national coordination for monetary stability at regional level. It is well known that stability of exchange rate could be attained with less cost and easily if the systems and policies among related countries are coordinated. ASEAN+3 meeting started to discuss the currency and financial cooperation among East Asian. As known, the ASEAN+3 meeting were transformed into multilateral one last Meeting. Therefore it is evaluated that the initial background for currency and financial cooperation among East Asia countries were established. There are suggested many ideas from AMF (Asian Monetary Fund) to Asian single currency unit, surveillance systems on the table ASEAN+3 Meeting. However, a significant progress has also been made with the 2009 agreement on further developing the Changmai initiative. Given the fact that most member countries want to stabilize the exchange rate, the cooperation for enhancing stability of exchange rate would be accelerated (Chung

and Eichengreen 2009).

In this regard, often discussed is the so-called “targeted floating exchange rate system” for East Asia. In this scheme, the member countries keep the exchange rate within specified range and permit exchange rate to float with respect to the currencies like U.S. dollar and Euro. If the exchange rates are fluctuated up to a specified range, the member countries intervene in exchange markets. In order to adopt the above the proposed targeted exchange rate system, benchmark currency needs to be set up. Asian currency unit is suggested as benchmark currency for pursuing the currency cooperation. Asian currency unit could be established by baskets of member currencies reflecting trade share or other economic size. It remains to further consider the concrete measures for promoting Asian currency units and exchange rate systems on the level of government. Here we are now limited to suggest the necessity of the currency cooperation over the East Asian region in order to restore the stability of the exchange rate.

4. Micro Sources for Macro-Instability

1) Structural changes in foreign exchange (FX) market and their implications

Korean foreign exchange market has experienced great structural changes since the 1997 economic crisis. This paper will focus on two fundamental changes that affects to the behaviors of market participants. The first and the most important change was the transition from the managed foreign exchange regime into a perfectly flexible foreign exchange system. This transition has greatly changed the incentive structure and behaviors of market participants. They take part in either sometimes a sell-side or a buy-side of foreign exchange. Before the 1997 economic crisis or during the period of the managed foreign exchange system, most trading in foreign exchange market is done for the sake of real economic needs such as exporters wanting Korean Won (KRW) instead of US dollar and importers needing US dollar instead of KRW. Rare are the demands for hedging against or speculating for FX risk.

However, as the flexible foreign exchange regime makes foreign exchange rate more volatile after the economic crisis, the participants in foreign exchange market have become heterogeneous, creating a great deal of new demands in foreign exchange market. Above all, exporters and importers sought to hedge their transaction values against foreign exchange risk, which in turn led to create a chain of transactions to accede to a series of the

derived demands. That is, the counterparties such as commercial banks, which matched the hedging demand of exporter, also have to hedge his position by transactions with another counter parties. This means hedging creates another hedging. And Speculators in FX market played an essential role in accede to a chain of hedging demands. In addition, the room for arbitrage has been widened as a big margin occurs between the domestic interest rate and the foreign interest rate. It also deserves note that much hedging demands creates new types of foreign exchange markets such as FX swap, Currency Swap and KRX currency futures and option.

Second, FX liberalization and capital market opening have been rapidly undertaken since the 1997 economic crisis. Above all, bond market was fully opened to foreigners at the end of 1997 while securities markets were fully opened to foreigners at the mid-year of 1998. These steps were in accordance with the FX liberalization policy that has been focused on attracting foreign capital. Accordingly, Capital inflow was led by portfolio investment by 2005. However, this capital-inflow-oriented policy brings about some side effects, provoking a spike in KRW valuation and a surge in interest burden by sterilization policy of BOK. As KRW is expected further upward pressure, liberalization policy has been changed to center on promoting the outflow of domestic capital from 2006. Outbound FDI was fully opened and the resident was admitted to buy foreign real estates without restrictions. And offshore fund and overseas fund domiciled in domestic jurisdiction were also admitted, hereafter making a boom of outbound foreign equity-related investment to 2007. In a short, Korea actually got to achieve a perfect FX liberalization and capital market opening only except for the internationalization of KRW. As a result, since then, Korea have exposed more directly to the external shocks from international FX markets.

2) New Source of instability involving the Forward exchange contracts

Foreign currency liquidity crisis would occur when foreign currency debt fails to be rolled over due to an unexpected shock although foreign currency asset exceeds foreign currency debt. Korea has experienced two foreign currency liquidity crises in a recent decade. However, two liquidity crises have significant differences in mechanical structures that cause liquidity crises. In the 1997 economic crisis, currency liquidity crisis was triggered not by commercial banks but by Korean merchant banks which was indulged in the foreign equity investment with short-term borrowing seeds. That is, currency liquidity crisis of 1997 occurred due to an aggressive foreign equity investment without liquidity risk management. Meanwhile, foreign currency liquidity crisis of 2008 has a different background in that Korea has a flexible FX regime and a fully opened capital markets. And currency liquidity crisis of 2008 also occurred in commercial banks that are admitted to treat widely the FX-related businesses.

Commercial banks had great deal of FX assets, with different purpose from merchant banks of 1997. Their FX assets were obtained mainly to accede to counterparty's hedging needs against FX risk. There are mainly two hedgers in our FX markets. The first comes from real economic activities under flexible FX regime. Exporters, who have long time-lags between exporting contracts and its settlements, tend to hedge their amounts of exports from FX downside risk. Shipbuilders are among the one of the most influential long-term hedgers. Shipbuilders sell the future receipts in the US dollars forward markets to hedge the FX risk. The second is related to domestic mutual fund markets. With the liberalization of investments about offshore fund and overseas fund domiciled in our jurisdiction, there was a sharp rise in overseas investment fund, which induced the massive hedging demands to manage FX risk. Interestingly, there showed a big contrast between offshore fund, intentionally taking FX risk, and overseas fund domiciled in our jurisdiction, hedging FX risk. These FX hedging demands were almost absorbed by commercial banks. Securities firms have limitations to play a role in receive these OTC FX hedging demands because of the low credit ratings and small capital base.

By the way, commercial banks have to rebalance their FX positions because they are in a net long FX position as soon as they buy the dollar forward exchange contracts from exporters and mutual fund. That is, banks have to sell the dollar spot exchange contracts as much as they buy the dollar forward exchange contracts to offset their net long position that the buying contracts exceed the selling contracts. That is why banks go to swap market to borrow the dollar spot exchange. In this market, domestic banks take a CRS receive position to fund the dollar spot exchange at the same time that supply the agreed KRW amounts and give a floating US dollar rate. And foreign banks take a CRS pay position in this market where they supply the agreed US dollar amounts and give the fixed CRS rate.

The problem is that domestic banks tend to borrow the US dollars with short-term maturity in order to make a funding cost cheaper. In a short, banks buy the long-term dollar forward exchange contracts from shipbuilders while they borrow their dollars in short-term contracts, taking a roll-over risk. That is a fundamental reason that currency mismatch occurs under the financial stress.

5. Micro-Level Reform Issues for financial stability

1) Setting the Agenda: from bank liquidity to currency liquidity

Bank liquidity risk means mismatch risk between bank's liability side and asset side in terms of maturity. Thus, measuring and managing bank liquidity risk is as important as

capital/solvency risk management. However, prior to current financial crisis, this risk did not receive adequate attention, either in the Korea or even in the global dimension. Because all debates about bank regulation were dominated by the design of the Basel II capital adequacy standard. In addition, Basel II, which defines the amount of capital bank should hold to cover its risks, do not cover liquidity risks. Unlike the capital adequacy rule, there is no globally accepted regulatory standard for liquidity. There are considerable differences between the regulatory frameworks in different countries.

But, liquidity shortage at a bank affects not only the bank but also small depositors, who can hardly be expected to monitor a bank's activity. In addition, a liquidity crisis in one bank spreads quickly to other banks through the financial linkage. A traditional approach for liquidity management is to manage liquidity ratios. These are designed in such a way that liquid assets maintain a particular proportion to liquid liabilities. Or, another rule is to manage the durations of asset side and of liability side. Current financial turbulence has reminded regulatory authorities of the need to make a new guideline for the efficient liquidity risk management.

Financial Stability Forum (FSF, 2008) suggests the guidelines of the supervisory authorities will cover the following areas: First, to identify and measure all types of liquidity risk, including those caused by off-balance sheet exposures; Second, to conduct liquidity stress tests to capture the systemic impacts of bank's funding plans; Third, to monitor cross-border flows and management of liquidity risk in foreign currency; Fourth, to reinforce the reporting and market discipline to promote better management of liquidity risk. Since the announcement of FSF, many regulatory agencies such as FSS of England and BIS are preparing the guidelines for liquidity risk management suitable for each country's circumstances. The FSS of Korea have announced the draft for the guidelines some days ago. In this regards, we should bear in mind that the advanced country and the emerging markets economies have a different point of interests each other. As for the emerging markets economies have special interests on cross-border flows and liquidity risk management in foreign currency, not in home currency.

Because, in an open economy that has no a key-currency such as dollar, external shocks are inclined to accompany currency liquidity crisis, heavily pushing a home currency down. As witnessed in current crisis, currency crisis in emerging markets are apt to begin to spread as foreign investors flees one country after another, endangering the squeeze in currency liquidity. Thus, as for emerging markets economies, the key tasks against external shocks are to manage well the balance of payment in a national dimension and to manage well the foreign asset and foreign liability in a corporate dimension. In particular, the level and trend in short-term foreign liability is a core interests to be managed and monitored.

However, although this global crisis has provided a number of important

lessons regarding currency liquidity, this problem has not yet been chosen as a major agenda in the discussion around the globe to consider reform options for the post-crisis financial system architecture. This is partly because this issue is relevant only to the emerging markets economies including Korea. Advanced countries such as United States and EU have never experienced currency liquidity problems. As a result, it's not easy to find this problem in a policy recommendation from BIS and FSA (BIS, 2008, FSF, 2008). This also reflects the situation that emerging markets economies have little influence in setting up new agenda for post-crisis regulatory reforms. In contrast, as mentioned above, there were suggested many recommendations concerning banks' liquidity holdings which are proved to be insufficient amidst current financial crisis. As in the area of capital, the FSB(Financial Stability Board) and the Basel Committee are working at full throttle towards an internationally coordinated liquidity standard for banks.

In this sense, it is fortunate that South Korea becomes a next co-chair country of the G-20 meeting and a member of the steering committee under FSB, which have a significant role in selecting and coordinating global regulatory issues. It is reported Korea had a leading role in raising and adopting the currency liquidity problem of the emerging countries at the 2nd general meeting of FSB that was recently held. Foreign currency money markets need to be oversight more strictly to reduce the volatility in exchange rate of emerging markets so that more sophisticated and more harmonized regulatory tools should be developed under the cooperation of international agencies. Korea proposed this problem, in which the emerging markets economies have common interests, be treated as a common agenda at the Committee on Global Financial System under BIS.

2) Reform Measures

Considering current debates on this problem, Korea is about to seize a big chance to initiate the discussion on currency liquidity regulation, representing the emerging market economies' concern in building a crisis-resilient financial system. This paper suggests several measures to alleviate the currency mismatch problems. The first is about short-term measures. We will suggest the tightening of currency liquidity management, and optimal hedge ratio as a sophisticated investment strategy. The second is about long-term measures. We refer to the enlargement of the core dollar liabilities of banks, and the internationalization of Korean Won.

Two Short-term Measures

From over-hedge to optimal hedge strategy

As the flexible exchange rate system was introduced in 1997 and overseas investments by domestic investors also have spread since 2007, the hedging demand against currency risk has been sharply increased. Thus, this need has led to a structural excess supply in FX markets, which in turn has increased the pressure of KRW appreciation especially since 2006. During 2006 to 2007, average hedge ratio of all shipbuilders amounted to 54% while that of overseas investment fund by domestic investor was as high as 80%. This means some of these demands were so speculative to enjoy the capital gain from currency risk through the over-hedge contracts, exceeding 100% of the principal amounts that exposed to currency risk.

In fact, there's no norm what the optimal hedge ratio is. It depends on investors' attitude on financial risk, the historical correlation between foreign exchange and price of investment securities. However, in the world of asset manager, there's a rule of thumb as to whether it should hedge currency risk or not. According to Campbell et al.(2007), foreign bond investment need to hedge currency risk because the return from bond investment and from holdings of foreign currency are independent each other. Meanwhile, whether to hedge currency risk from foreign equity investment would depend on the correlation of return between equity and currency. If returns from equity are positively correlated with return from exchange rate, just exposing to currency risk is a superior strategy to hedging the risk in terms of total return. During last financial turmoil, equity return and exchange rate of KRW against major foreign currency moved each other in the opposite direction, resulting in huge losses of overseas fund investment that hedged currency risk.

As far as hedge ratio is concerned, regulatory authority has little room to intervene this problem, because investors are in charge of deciding whether to hedge or not. Rather than direct regulation, imposing more strict disclosure rule as to investor's cost from hedging or another potential risk from hedging will help investor's rational judgment. And regulatory intervention could also be made indirectly through the prudential regulation of the banks, a counterparty receiving hedge demand of foreign currency. If regulatory authority would set the ceiling of currency-related derivative contracts by counterparty, excessive-supply phenomenon in forward exchange market would be alleviated.

Tightening currency liquidity management and covering branches of foreign banks

Two episodes of foreign currency liquidity crises in Korea suggest that currency mismatch occurs when financial firms maximize their profits without risk management, chasing to lower their funding cost through a short-term borrowing and raise their rate of return through a long-term investment. That's why Financial Supervisory Service (FSS) have to oversight bank's FX businesses more strictly. So

far, FSS have supervised the currency liquidity by using a variety of advanced financial indicators. Foreign currency liquidity ratio, one-month gap ratio, and 7-days gap ratio are among these indicators, which are also what is suggested by the international organizations such as IMF in FSAP(Financial Soundness Assessment Program). However, what is ironical is that these all indicators were in the normal range during 2008 currency liquidity crisis.

If so, what went wrong? This paper raises at least three problems to be improved in managing currency liquidity. The first is about the coverage of currency liquidity regulation. In principle, currency liquidity regulation should be applied to every banks operating in domestic jurisdiction in order to maximize the policy effects and to remove the regulatory arbitrage. However, so far, domestic branches of foreign banks have been actually free from this kind of currency liquidity regulation. We don't know exactly why. But, such asymmetric regulation between two groups, which give a big favor to domestic branch of foreign banks, has had a negative repercussion on the soundness of foreign exchange money market as well as domestic branches of foreign banks.

Thus, these asymmetric regulations should be corrected. Financial authorities shall bear it in mind that regulatory arbitrage from asymmetric regulation would cause the foreign-bank-dependent currency market structure and even deepen it. The loose regulation would widen the rooms to speculate and arbitrage in FX money markets. In this sense, applying regulation concerning currency liquidity to all banks operating in domestic jurisdiction is one of the basic and essential policy tasks to prevent the same crisis in the future. Financial authorities should promulgate a policy road map to narrow gradually the regulatory gap between domestic players and foreign players as soon as possible.

However, financial regulatory authorities are hesitant about imposing stricter regulations on domestic branches of foreign banks, weighing the costs against the benefit from stricter regulations. **They seem bear two kinds of side effects in mind against stricter regulations. Above all,** domestic branches of foreign banks have played dominant roles in domestic FX market, serving as a key supply channel meeting the domestic demands for the dollar currency. As shown in the table 2, the size of their short-term external debt is much bigger than that of domestic banks. These dollar-denominated funds were invested into domestic financial markets in the form of fixed income products via swap markets including FX swap and CRS. Their holding of Korean debt is estimated at 49 trillion Korean Won as of the end of September 2009, including about 42 trillion Won of treasury bonds (reported in S. Lee 2009).

Under this market condition with a heavy dependence on foreign banks (and

their local branches), regulating foreign bank branches more strictly would result in a shortage of dollar supply and even a significant disturbance in domestic financial market. That is, a shortage in dollar supply would change the dollar-denominated short-term money markets into supplier's market and raise a funding cost of domestic firms. And also that would make foreign investors difficult to access in domestic fixed income market. Fixed income market would shrink sharply and interest rate would rise.

Table 2 . Short-term external debt in Korea

(unit: year-end basis, billion USD, %)

	2006	2007	2008	2009. 1Q
Total external debt	260	382	381	369
Short-term external debt	114	160	151	148
(Domestic bank)	44	55	45	38
(Domestic Branch of Foreign bank)	52	79	68	65
Short-term external debt Ratio*	43.7	41.9	39.4	40.1

Note : * The ratio of short-term debt over total external debt

Source: The Bank of Korea

Another side effect is relevant that they have a fragile capital structure in terms of liquidity. As shown in table 3, they have little external claims while they have much external debt. Their ratio of external debts over external claims reached at 6.3 in 2008, much higher than that of domestic banks which is lower than 2.0. This means they are exposed to a high liquidity risk that is very vulnerable to an unexpected price shock. So, when the situation turns uncertain, for example, the collapse of Lehman Brothers, they had to act quickly to defend their vulnerability. Actually in the wake of the 2009 financial crisis, they repatriate dollars quickly or pulled out dollars here to pay debt amid global deleveraging. According to the Bank of Korea, the net dollar outflow through foreign bank's branches stood at 24.4 billion dollars for a year from the start of crisis in September 2008 (S. Lee 2009). The amount, which is the largest on record, accounted for about 67 percent of the total dollar outflow through banks in Korea (S. Lee 2009).

Table 3. Bank's External Balance in Korea

(unit: billionUSD, multiple)

		2001	2003	2005	2007	2008
Domestic bank	Net Claim	-4	-10	-16	-45	-28
	Debt/claim	1.1	1.3	1.4	1.7	1.4
Domestic Branch of Foreign bank	Net Claim	-6	-14	-15	-71	-61
	Debt/claim	1.8	2.7	2.4	6.6	6.3

Source : The Bank of Korea

Considering overall costs and benefits from symmetric regulation, the policy for correction needs to be gradual and incremental in order to balance between market stability and efficiency. Setting the regulatory agenda in order, policy steps to reduce over-hedging demands would be instantaneously applicable to domestic branches of foreign banks as well as domestic banks. Position ceilings by counterparty and by OTC currency derivatives would help reduce over-hedging incentives between counterparties. After reducing speculative demands through position ceilings, further steps would be taken to correct the asymmetry. An alternative would be a restriction on short-term funding which would put a bottom in long-term funding ratio. Regulations such as liquidity ratio or gap ratio would be longer challenges ahead because the domestic branches of foreign banks incline to have smaller foreign assets than foreign liability due to their business model in nature.

The second is to change the regulatory criterion and to develop the more sophisticated tools for bank's currency liquidity. The important reason Korea fell into currency liquidity crisis despite a soundness in liquidity indicators is that all these indicators were oversight on an end-of-period basis by FSS. FSS's oversight on an end-of-period basis has never contributed to reducing the volatility of FX market. On the contrary, that kind of oversight led to a periodic disturbance in FX market by causing an excess FX demand every end-month. Thus, the criterion FSS manages currency liquidity needs to be changed from the end-of-period basis into the period-average basis.

Next, FSS need to drill the regulatory tools more sophisticatedly with reference to the methodology of new liquidity management guidelines suggested by BIS. That is, new BIS guidelines need apply to the currency liquidity management. The stress test based on an adverse scenario analysis needs to be adopted. And the scenarios include a massive loss of confidence from depositors, a disruption of secured funding and a loss of liquidity on business lines of the securities markets.

The third is to introduce the direct regulation that put the ceiling on holdings of foreign assets. There are some probable ideas that FSS puts the minimum requirements as to

the ratio of foreign liquid asset over total foreign asset. And core funding ratio such as foreign loan to foreign deposit would be a good idea in that it helps not only reduce currency mismatch but also increase the core funding base which is relatively stable even in time of financial turmoil. Most developed countries have not used this core funding ratio (e.g. loan-to-deposit ratio) as regulatory tool so far. Now, experiencing current financial crisis, global investors realized its importance and even raised the possibility of Korean currency crisis, criticizing Korea has too high loan-to-deposit ratio. In this regard, core funding ratio as to foreign asset and liabilities would be an effective regulatory tool for currency liquidity management.

Longer Term Measures

Supply side: Enlarging the dollar deposits base through overseas business

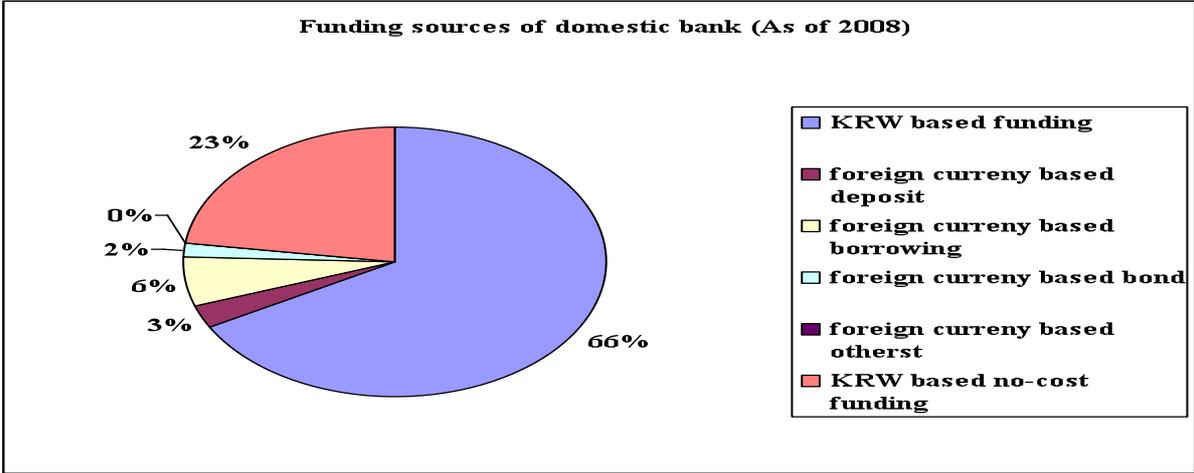
The weakest point Korean FX market faces is that we have no stable dollar-denominated debt-financing enough to accede to massive hedging demands. Deposit-type debt is known to be the most stable debt that is relatively free from liquidity squeeze. As mentioned before, liquidity cannot always be obtained, which reassures the importance of retail deposits that are relatively stable funding source. Nevertheless, In Korea, deposits on a foreign currency basis are as merely small as about 3% as shown in the below figure. Thus, the great portion of foreign currency that clients demand should rely on foreign exchange swaps, short-term borrowing, repo transactions etc. These kinds of funding eventually depend heavily on liquidity conditions in the market. We have experienced the collapse in the functioning of the foreign exchange swap market, which made it difficult to obtain funds in foreign currency after the collapse of Lehman Brothers.

In this regard, the more proactive steps to enlarge the deposits base on a foreign currency basis are needed to stabilize the FX markets. Because banks have no need to borrow short-term dollar-denominated from foreigners if domestic banks have much dollar-based deposits enough to offset the extra position caused by buying forward exchange contracts from shipbuilders.

The shortage of dollar denominated deposit in Korea seems closely related that banks fail to take the dollar-denominated debt deposit from the residents and also fail to the financial globalization that enable domestic banks to collect dollar-based deposits from foreigners. So far, domestic banks have been very passive to setting up the overseas subsidiaries or acquiring the overseas financial firms. As a result, we experienced repeatedly the vicious cycle in FX market that banks, which depends entirely on overnight borrowing from foreign banks to accede to a massive

domestic hedging demand, again fall into foreign currency liquidity risk. The stability of FX market in financial turbulence would be achieved by the more proactive strategy of banks to expand into overseas business.

Figure 3.



SOURCE: Financial Supervisory Service

Demand side: Internationalization of Korean Won (KRW)

The internationalization of KRW is an important agenda to stabilize FX market. KRW trading volumes in global financial market are too small in light of our opened capital market and the enlarged FX demands. Now, over 80 percents of Korean exports are settled by US dollar and the portion of KRW out of settlement currency is below 1 percent (table 4). This is contrasted with Japan’s case that about 40 percents of Japanese exports are settled by Japanese Yen in 2008. Korea is in a leading position of major exporting items such as semiconductor, shipbuilding, automobile, Mobile phone etc. Such leading positions would help making a bargaining power to determine the settlement currency. More proactive steps to internationalize the KRW help stabilize FX market by reducing hedging demand itself.

Table 4. Composition of settlement currency for Korean exports
(unit: %)

	USD	EURO	YEN	KRW	YUAN	OTHERS
2002	85.0	5.5	5.4	0.4	0.002	3.7
2003	83.6	6.5	5.6	0.4	0.002	3.9

2004	82.3	7.3	5.6	0.4	0.002	4.3
2005	79.1	8.4	5.6	0.5	0.003	6.4
2006	79.6	8.8	5.0	0.6	0.002	6.0
2007	77.2	9.6	4.8	0.7	0.003	7.7
2008	81.6	7.6	4.7	0.8	0.005	5.2

Source: Ministry of Knowledge Economy

6. Summary and Concluding Remarks

This paper takes a structuralist macroeconomics perspective to interpret the two recent financial crises in Korea, and suggest a new policy framework and reform measures to build a crisis-resilient macro-financial system in Korea.

According to the so-called ‘Frenkel-Neftci’ cycle (Taylor 1998), the crises originate from the two kinds of expected spread, interest spread and capital gain spreads that initially motivates foreign capital coming into emerging economies. Then, a sudden change in expected return such as exchange rate devaluation, real estate price collapse, and/or stock market crash can result in huge capital outflows in a very short period and in currency crisis. In the case of the 1997 crisis, the spread was mainly from interest spread and the associated huge amount of capital inflows, such as Yen carry trade. In the case of the crisis of 2008, the spreads opened due to, first, high interest rate policy by the Korean government aimed to suppress real estate price increase, and, second, the expectation about exchange rate appreciation, and thirdly stock market returns after recovering the crisis. Then the subprime crises produced the sudden change of expectation of the market participants. The credit crunch in the international capital markets, and the possibility of exchange rate depreciation by the Korean government to promote exports, lead to the huge capital outflows.

To establish a crisis-resilient macro-financial system, this paper has suggested a new macro policy framework that can be described as “an intermediate system” with partial capital control, a flexible BBC (basket, band, crawl) exchange rate system and relative independence in monetary policy making. With regard to specific macro-level measures, we suggest the two: Tobin tax and reserve requirement. Tobin tax impose a small tax on all foreign exchange transactions, thereby discouraging the buying and selling of foreign exchange for very short term purpose with speculative motives, while it does not give burden to long term capital movement. Some reserve requirement policy requires foreign investor to place some of the fund in a bank for a period of time. As the fund can be used for the investment after a

specified period of time, the long run capitals are not hindered to flow. The other capital controls which Epstein examined, are not evaluated to be appropriate for capital controls in Korea because those are based on quantity based ones, thereby incurring higher costs

Next, at the micro-level, we see that the key tasks against external shocks are to manage well the foreign asset and foreign liability in a corporate and bank dimension. In particular, the level and trend in short-term foreign liability is a core interests to be managed and monitored. However, this problem has not yet been chosen as a major agenda in the discussion around the globe to consider reform options for the post-crisis financial system architecture, because the advanced countries such as United States and EU have never experienced currency liquidity problems with their currencies as international key currencies. This paper suggests several measures to alleviate the currency mismatch problems.

As short-term measures, we have suggested the tightening of currency liquidity management, covering not only domestic banks but also Korean branches of foreign banks, and optimal hedge ratio as a sophisticated investment strategy. For example, suggested is a minimum requirement regarding the ratio of foreign liquid asset over total foreign asset. Also, core funding ratio such as foreign loan to foreign deposit would be a good idea in that it helps not only reduce currency mismatch but also increase the core funding base which is relatively stable even in time of financial turmoil. The long-term measures include the enlargement of the core dollar deposits of banks and the internationalization of Korean Won.

One might think that if we put in place various micro-regulations on the financial sectors, such macro measures like Tobin Tax or alternative exchange rates scheme would not be necessary. That is true only if we are able to install the perfect regulation schemes removing all the possibilities for financial arbitrages and sufficiently reducing risks. But, this seems impossible. For example, while loose or no regulation of Korean branches of foreign banks is one of the most apparent example of asymmetric regulation and regulation loop hole, the regulatory authorities are not taking any clear-cut actions. Also, while many new regulatory indicators are introduced, we are not sure how precisely they will serve as early warning signals, given the existing loop holes; as noted, many indicators showed no warning signal at all in 2008. Such situation calls for additional or macro-economic, measures for anti-crisis stability.

An obvious candidate is active capital account management policies including controls on short term flow (eg Tobin Taxes), which has now emerged as a new policy consensus at least in Europe although still rejected by the US. The recent experiences in Brazil in imposing a fee on short term flow led to a sudden 10%

drop in stock prices. While some cite this as too-much cost (penalty) of acting alone without international coordination, one can also consider that Brazil is succeeding in stabilizing financial flows and exchange rates and 10% reduction of stock price is not that bad as a cost. If a 10 percent reduction of stock prices would keep a country safe from a bubble and a possible crisis later, there would be many countries that would be willing to take the charge, given a huge and long lasting cost of a crisis. A similar logic could justify the costs of more regulations, as long as they would reduce substantially the possibility of a crisis (Stiglitz 2009).

A justification for an intermediate system proposed in this paper can be made in view of the fact that it is not easy to prevent the “two kinds of spread” from happening in a standard (orthodox) (open) macroeconomic policy setting. It is similar to the trilemma where full capital mobility, floating exchange rates, and monetary authority cannot co-exist together. As analyzed in section 2.3, the two crises erupted as we cannot easily manage the two spread. For example, closing the interest spread under full capital mobility was in conflict with domestic policy priority on cracking down on real estate bubbles. Closing the exchange rate spread is not easy under full capital mobility as some ranges of exchange rates are hardly acceptable in terms of its impacts on real economy and trades. While a large amount of foreign reserves help definitely, it is very costly (earning too low rate of return) and, furthermore, tend to increase domestic money supply and inflationary pressure leading to other bubbles. The Brazilian experience indicates that Tobin tax can be used as if as a short term macroeconomic policy tools by varying the rates of fees.

Finally, the recent IMF staff position paper (Ostry et al 2010) has acknowledged the necessity of capital control as a tool responding to transient surge of in-flows. A key conclusion is that, if the economy is operating near potential, if the level of reserves is adequate, if the exchange rate is not undervalued, and if the flows are likely to be transitory, then use of capital controls—in addition to both prudential and macroeconomic policy—is justified as part of the policy toolkit to manage inflows. Korea appears to meet these conditions as of the situation in 2009. This IMP paper also argues that such controls, moreover, can retain potency even if investors devise strategies to bypass them, provided such strategies are more costly than the expected return from the transaction: the cost of circumvention strategies acts as “sand in the wheels.”

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