Tokyo
March 10,1998
Wharton- Long Term Credit Bank Conference

The Asian Crisis in Context

by

Barry Bosworth

The dramatic nature of the exchange rate collapses in Asia has greatly stimulated efforts to understand and control the forces that cause such crises. While currency crises are not new, those in Asia stand out both because of the severity of the economic dislocations and because they do not seem to fit the standard explanations. The Asian crises lack the clear evidence of distorted domestic macroeconomic conditions that were believed to be key to most past currency crises, yet they are among the most extreme in terms of the magnitude of exchange rate depreciation and output loss. Instead, the Asian vulnerability derived from microeconomic weaknesses in their domestic banking systems and extreme levels of exposure to exchange rate risk by those who borrowed in foreign markets. In this regard, the experience reinforces prior warnings of the dangers of removing controls on international capital flows in the presence of weak, or repressed, financial systems.

Second, the Asian crises have promoted an intensified discussion of the appropriate policy response to a crisis, both by the countries involved and by the International Monetary Fund. With capital account convertibility, the potential magnitude of sudden claims on a country's foreign exchange reserves far exceeds the levels observed in earlier currency crises. Under such circumstances, how can countries effectively respond to a run on their currencies, and should the International Monetary Fund step in as a lender-of-last-resort? Can a lender-of-last-resort function be sustained at the international level in the absence of strong prudential supervision of financial institutions and markets without raising intolerable problems of moral hazard?

This paper has three parts. The first part examines the Asian crisis within the context of past research on the causes of exchange rate crises. The second part addresses some issues of the post-crisis response: what can the Asian countries learn from earlier experience to minimize the economic fallout from the exchange rate collapse. The third section examines the systemic issue of the appropriate international response to these crises, and the actions that individual countries can take to protect themselves..

I. The Origins of Exchange Rate Crises

Currency crises are a surprisingly common event. A recent study of 20 advanced countries identified 78 crises over the period of 1959-93 (Eichengreen, Rose, and Wyplosz, 1995). Another study found 117 crises in 105 developing countries between 1971 and 1992 (Frankel and Rose, 1996).[1] Much of the research on the causes of these events has revolved around the question of whether the crises can be attributed to deterioration in the economic fundamentals in the country under attack, or to unexpected shifts in expectations. In a model developed by Krugman (1979), a currency crisis is a consequence of domestic macroeconomic policies that are inconsistent with the maintenance of a fixed exchange rate: they lead ultimately to exhaustion of a country's reserves. The model shows the conditions under which a currency will be subject to a speculative attack, and it is capable of predicting the timing of the attack. In contrast, Obstfeld (1986) and others have developed models in which the timing of a crisis is unpredictable because it is the result of unexplained but self-fulfilling shifts in expectations.

The empirical studies have provided some support for both of the theoretical explanations. The probability of a crisis is positively associated with overvalued exchange rates, rapid growth in domestic credit relative to GDP, low reserve levels, and increases in international interest rates. At the same time, there is strong evidence of contagion effects, emblematic of

[1]In these studies, a currency crisis is defined in terms of a large depreciations of the exchange rate, loss of reserves, and/or large increases interest rates. Frankel and Rose use a cutoff of a 25 percent decline in the exchange rate.

shifts in expectations. The surprise is that there appears to be very little association between large current account or fiscal deficits and subsequent crises.[2]

By the standard of recent events in Asia, however, most of the crises analyzed in the above studies were minor. In both the samples of industrial and developing countries, the typical outcome was one in which output growth actually accelerated in the year following the crisis. In contrast, the recent crises -- most notably, Mexico (1995) and Asia (1997) -- have been much more costly. The large-scale crises are different in at least two dimensions: first, they are reflective of stock as opposed to flow imbalances; and, second, they are closely intertwined with severe distortions in the domestic financial system. The combination of open capital markets, with their potential for large cross-border capital flows, and the liberalization of previously repressed financial institutions creates a potent brew for a currency crisis.

Flow Versus Stock Adjustments. For much of the post-Bretton Woods period, the growth of the international economy was limited to the expansion of trade in goods and services. Capital transactions between national markets were strictly controlled in all countries, and international financial flows were limited to direct investment and a small amount of bank lending, generally to governments. In such circumstances, exchange rate crises were largely reflective of a simple flow disequilibrium. A country's spending would gradually come to exceed its income, a current account deficit would result, and at some point lenders would question the sustainability of its borrowing. These flow disequilibriums seem very consistent with Krugman's model of currency crises.

The IMF became quite adept at stepping in, providing the countries with short-term loans to cover the deficit, and helping them design an adjustment program to restore balance. That usually consisted of a currency devaluation and a realignment of domestic fiscal-monetary

[2]The above conclusions were consistent for the papers by Frankel and Rose(1996), Sachs and others (1996), and Kaminsky and Rienhart (1996), all of which focused on developing economies. It is interesting in light of current events, however, to note how frequently the paper by Sachs and others and the subsequent discussion points to the Asian economies as examples of countries that got it right.

policies to scale back domestic demand. The financing costs were generally small, and the adjustment quickly translated into positive benefits for growth in real output and employment.

The perspective of a flow imbalance with limited foreign exchange exposure, however, becomes increasingly irrelevant in a world of capital mobility. The United States established capital account convertibility in the early 1970s, and over the next decade, most other industrial countries followed suit. Today we are going through the next stage of that process as more and more developing countries are pressured to adopt policies consistent with the free flow of financial capital across their national borders.

The Latin American debt crisis of the 1980s revealed some of the coming problems of open financial markets because it rested on the development of a rudimentary international financial system based on private bank lending. Under pressures to recycle the surpluses of the oil producing countries into Latin America, international banks operated on the basis of unrealistic expectations of the sustainability of large global imbalances, limited information, an underestimate of the risks, and a belief that governments were too big to fail.

In other respects, the debt crisis resembled the old model in that it was reflective of countries consistently spending beyond their income and accumulating debt at an unsustainable rate. It still involved only limited capital mobility; but since the industrial countries had abandoned capital controls, it was becoming increasingly difficult for others to maintain restrictions on capital flows in and out of their economies.[3] The magnitudes of external debt raised significant concerns about basic solvency for some countries; and it took nearly a decade for the countries and their creditors to agree on a plan for resolving the crisis.

More recent crises, such as the Mexican crisis of 1994-95, and now Asia, seem quite different. They were not initiated by concerns with the solvency aspects of excessive borrowing, and it has been difficult to identify fundamental macroeconomic policy errors that triggered the

[3]Under the old system, there was as much interest in preventing inflows (and the associated currency appreciation) as outflows. Thus, there was a basis for international cooperation to discourage cross-border capital flows. That cooperative environment is gone.

crises. Most importantly, the magnitude of the financing imbalances are driven by stock, not flow, considerations. Investors seek to allocate a stock of wealth among various national assets that are becoming increasingly substitutible wih one another. The reallocation of those assets in reaction to news can generate short-term demands on a country's foreign exchange reserves far larger than those envisioned in the old regime of limited capital mobility. The concern is not just with the reversibility of past foreign capital inflows, but with a large potential for capital flight as domestic wealth holders and foreign short-term creditors suddenly seek to convert their stock of assets to foreign currencies. Thus, these countries were faced with liquidity crises most analogous to old-fashioned bank runs (i.e. a currency run).

Prior to Mexico, the largest IMF stand-by credit arrangement was the $4 billion agreement with the UK in 1977. The agreement with Mexico was for $17.7 billion and it was part of a $52 billion multilateral package. The three Asian agreements have involved $35 billion from the IMF and commitments of about $60 billion from other sources. Those magnitudes of need were on top of exchange rate devaluations of about 50 percent. While portions of these stand-by agreements might not be used, it is evident that the crises involved unprecedented magnitudes of shortfall in required foreign exchange reserves. They had to be scaled in terms of the potential stock of private assets that might be moved, not annual flows.

After the fact, economists can always find serious problems with the domestic economic policies of countries that are hit by a currency crisis; and, in that respect, the Asian economies are no exception. However, any errors in the traditional realm of macroeconomic policy seem small and insufficient to account for the magnitude of the currency collapse. Table 1 reports several measures of macroeconomic conditions in the major emerging economies of Latin America and Asia. As shown in columns 1-3, the Asian countries had relatively strong fiscal positions, low inflation, and high growth rates. Several countries did have surprisingly large current account deficits; but the usual argument has been that deficits are tolerable if the funds flow through to capital formation (as in Asia) rather than consumption (as in Mexico). It is also difficult to observe a major over-valuation of their real exchange rates on a trade-weighted basis

(column 4).[4] In most cases, it seems more logical to interpret the current account deficits as have been 'caused' by a surge of foreign capital inflows rather than the reverse of excessive domestic spending drawing in capital.[5] Their overall indebtedness seems moderate both relative to GDP and exports (columns 6 and 7); and, concerns over basic solvency do not seem to have played a major role in the crisis, differentiating it from the Latin American debt crisis.[6]

Like the 1994 crisis in Mexico, the fundamental issue in Asia was one of liquidity, not solvency. Their vulnerability was in the concentration of the debt in short-term liabilities and a low level of reserve assets. Thus, Indonesia, Korea, the Philippines, and Thailand all had unusually low ratios of reserves to short-term debt (column 10).[7]

The Role of Finance. The vulnerability of the Asian economies to a currency crisis derives largely from the actions of their financial institutions. The Asian economies have favored banks over security markets as institutions for financial intermediation. In several cases there is little or no public debt to be traded; and enterprises rely on bank loans rather than bond or equity issues to obtain external capital. And what was once seen to be a important contributor to rapid economic growth, the intermediation of savings through the banking system, is now seen as a major weakness. For example, in his review of the empirical evidence on the link between finance and growth, Levine (1997) stressed a series of financial measures, such the ratio of bank deposits and private sector loans to GDP, that were particularly strong in the high-growth Asian economies. Rates of growth in those same measures are now used as indicators of financial

---

[4]The persistence of a large current account deficit throughout the 1990s in Thailand creates a stronger case for overvaluation.

[5] For example, Korea, a country traditionally closed to foreign capital saw the net inflow of foreign portfolio capital rise from less that $1 billion in 1990 to $14 billion in 1996. Given its prior emphasis on banking institutions to intermediate the flow of funds between savers and investors, Korea lacked the markets to absorb such flows.

[6] Earlier, in trying to account for the severity of the Mexican crisis, some economists played up a history of debt problems, and they pointed to the Asian economies as examples of the benefits of a good reputation. In practice, reputations seemed to count for little.

[7]The Korean reserves were even more limited than shown in the table because some of the reserves had been loaned to private business firms. Thailand was also more vulnerable that implied by its published reserves because it had a large open position in the forward market.

excesses and vulnerability to crisis, suggesting that some financial characteristics that are good for growth might be bad for stability.

Over the past two decades, the most costly currency crises -- those that involved substantial output losses -- were linked to serious problems in the domestic financial system.[8] In fact, there are relatively few currency crises with serious output losses that did not involve an associated financial crisis. Kaminsky and Reinhart (1996) found that banking crises were much more likely in the period following financial liberalization programs, and in more than half the cases a banking crisis was followed by a currency crisis.

The disruption of Asian currency markets was not preceded by widespread bank runs: but the most severely impacted economies had experienced problems with their banking systems for years, and they were in the midst of significant programs of financial reform and liberalization, associated with the move to full convertibility for the capital account. But, liberalization of the system also creates opportunities for excessive risk taking by inexperienced bankers supervised by inexperienced regulators. Even in the absence of a crisis, a weak banking system is likely to limit the ability of the central bank to raise interest rates to defend the currency. In this respect, the interest rate increases were surprisingly modest relative to prior crises in other countries: they put up only a limited battle before allowing their currencies to depreciate.[9]

It is difficult to produce concrete measures of bank quality. With a strong accounting system, individual banks could be evaluated in terms of their capitalization and profit rates; but it is the regulatory and accounting system that are most suspect in many developing countries. A rough measure of bank quality is provided by the financial ratings of Moody's Investor Services. A summary of the 1995-96 ratings is shown in table 2 for banks in 38 countries. While the

[8]This seems particularly evident in the contrast between the surge of output growth in Great Britain after the 1992 crisis, compared to the sharp output falls in the Nordic countries where the collapse of real estate markets had created severe banking problems.

[9]This is particularly evident for Indonesia, which held on to nearly all of its reserve through the period of most severe currency depreciation.

number of rated banks is often limited, low scores are very conspicuous for the countries with the most severe currency crises.

Others have pointed to the rapid growth of bank credit in these countries to argue that they could not be exercising prudent loan evaluation. Bank lending to the private sector, scaled by GDP is reported for the major emerging market countries in table 3.[10] Several of the Asian economies do have very high levels of bank lending; and in recent years, it has expanded rapidly in Malaysia and Thailand.

On the other hand, there are many other countries with apparently weak banking systems that did not have a crisis. A weak banking system may be a necessary condition for a severe crisis, but it is not sufficient. Furthermore, it is difficult to argue that the weaknesses in the banking systems hindered the development of the Asian economies in prior years; nor do they display some of the other indications of repressed financial systems, such as abnormally high or negative real rates of interest.[11] The data of table 3 also point to earlier periods of rapid credit growth that did not give rise to a crisis.

The link between weak banks and currency crises is also somewhat tenuous in that even though an insolvent bank cannot raise the required domestic funds to repay creditors, that problem is separable from the issue of the availability of foreign exchange. One of the problems in countries that emphasize banks to the exclusion of security markets is that a run from banks automatically becomes a run from the currency because there are few domestic options.

To generate an external crisis of the magnitude of Asia, it is necessary to combine weaknesses in the domestic financial system with an effort to open those markets to international capital. The recent growth of external financial capital into the emerging economies is

---

[10]These statistics refer to the IMF's monetary survey of deposit banks. For Korea in particular, lending by other financial institutions is also important; but the data based on the broader definition of financial institutions are less comparable across countries.

[11] Given the emphasis on financial problems in the Mexican Crisis of 1994-95, it is surprising that the Asian economies weathered that crisis with so much less disruption than other countries in Latin America. What changed in the brief interval between 1995 and 1997 was investors' perceptions, not the the quality of the banking system.

highlighted in table 4. Total capital inflows tripled between 1990 and 1996 for the nine Asian economies shown in the table. Furthermore, flows of foreign direct investment were heavily allocated to China. For the others, much of the inflow was in portfolio capital and bank loans. Prior to 1990, flows of portfolio capital were trivial, but they exceeded $30 billion in 1996, with half that amount going to Korea.

On the basis of their experience in the 1980s, the Latin American countries have remained leery of bank loans; but the Asian economies showed no such restraint. For BIS-reporting banks, outstanding loans to Asia increased from $110 billion at the end of 1990 to $190 billion in 1993, then surged to $367 billion at the end of 1996. Total loans peaked at $390 billion in mid-1997, and two-thirds of those loans had a maturity of one year or less.

Lessons From the Past. Efforts of individual countries to liberalize their financial systems and link them to international markets have failed with surprising frequency. Those failures have spawned a substantial volume of research attempting to identify what went wrong; and much of that work has been sponsored by the IMF.[12] The studies have highlighted a series of interactions between the establishment of capital account convertibility and financial liberalization that appear to have the predictable consequence of generating currency-based crises. The most prominent examples were the failures of financial liberalization in the Southern Cone countries (Argentina, Chile and Uruguay) in the early 1980s and the Philippines in the mid-1980s, and the Mexican Crisis of 1994. All of these crises resulted in very severe economic recessions. Nor are the problems limited to developing economies: the Scandinavian countries experienced serious financial disruptions in the early 1980s that led to currency crises and recession, and both the United States and Japan have made costly errors in supervising their banking systems that initiated banking crises.

There are several lessons. First, it is dangerous to pursue capital account convertibility prior to the establishment of a sound domestic financial system. That is particularly true if

[12]See, for example, Alexander and others (1997), Enoch and Green (1997), and Sundararajan and Baliño (1991)

domestic interest rates are significantly above those available in international markets: domestic banks are tempted to borrow in international markets and lend domestically without the requisite skills and markets to manage their currency risks. Those problems are greatly worsened by government commitments to fixed exchange rates which lead participants to underestimate the currency risks.

Second, there is a large risk that financial liberalization will outpace improvements in the domestic regulatory system. Financial liberalization requires a profound change in the way that both banks and regulators behave. In repressed markets, the government often uses the banks as a tool of its industrial policy. After liberalization, it has to develop a supervisory function directed more toward discouraging excessive risk taking and rent-seeking behavior. In the short run, the process of financial liberalization often has the perverse effect of raising domestic interest rates, as liberalization and increased competition pushes some firms and institutions toward bankruptcy. But without strong regulatory supervision, banks that are in trouble will raise deposit rates and borrow to bet on one last role of the dice. The deposit rate competition, in turn, draws in otherwise healthy banks. Once a bank is seriously impaired by its customers' losses, it adds to the problem by rolling old bad loans over into new loans as a means of avoiding the recognition that it too is insolvent. These problems are worsened in countries that allow interlocking ownership of banks and enterprises.

Third, the regulators cannot be the only line of defense. It is equally important to expand transparency through stronger accounting and public reporting requirements, together with standards for internal governance, that promote effective risk evaluation and management control by private individuals and markets. With the growth of financial derivatives, the complexity of the system begins to exceed the capacity of an external system of control.

Currency crises tied to banking failures have typically had severe economy-wide effects. In the case of the Southern Cone countries, the Argentine real exchange rate fell by 50 percent over the period of 1980-82 and output declined by 10 percent. The contraction was even more severe in Chile where the real exchange rate fell by a fourth during 1982, and output shrank by

15 percent in 1982-83.[13] The assumption of private foreign debts and the recapitalization of the banking system raised the public debt of Chile by about 30 percent of the GDP.

In the Mexican case, the problems were not as concentrated in the banking system. The government had financed a major portion of its public debt with short-term marketable securities. The opening of domestic financial markets to foreign investors touched off a surge of asset price increases. After adjusting for general inflation, equity market prices rose more than five-fold between 1988 and the end of 1993. Like the Asian economies, Mexico was caught with an imbalance of reserves relative to short-term foreign liabilities, and the resulting currency crisis and high domestic interest rates created severe domestic banking failures. Flows of portfolio capital reversed from a positive inflow of $29 billion in 1993 to an outflow of $10 billion in 1995. Output fell by 6 percent in 1995, but growth recovered to average 6 percent per year in 1996-97. To date, Mexico has spent about 15 percent of its GDP on the recapitalization of the banking system.

In Sweden and Finland, financial deregulation in the late 1980s --particularly the removal of ceiling limitations on loans -- touched off an explosion of lending and a sharp boom in real estate and equity markets. The asset market boom, in turn, fueled a surge in domestic consumption. Tax reform and a rise in international interest rates burst the bubble in the early 1990s, and the resulting financial crisis led to a 5 percent decline of Swedish GDP in 1991-93 and 12 percent in Finland. Both countries were forced to abandon their pegged exchange-rate regimes. The banking systems were severely impaired and the costs to the government of the recapitalization totaled about 5 percent of GDP in Sweden and 10 percent in Finland.[14]

II. Response to the Crisis

[13]The exchange rates are those of Morgan-Guaranty, and the GDP data are from the World Development Indicators of the World Bank.

[14]Dziobek and Pazarbasioglu (1997).

The most distinctive feature of the recent currency crises is that they were initiated by issues of liquidity rather than solvency. But, while the response to Mexico alleviated the problem, the response in Asia exacerbated it. For Mexico and the Asian economies, the levels of external debt did not appear to represent severe burdens, and domestic economic policies, while not perfect, were not grievously out of balance. They were basically healthy economies faced with a shortfall of liquidity. The analogy is to a domestic bank run where a sound institution may need an immediate source of liquidity to respond to depositor demands for currency. The most immediate challenge is to prevent a liquidity problem from turning into a solvency concern.

Countries can respond to a currency crisis by some combination of increases in domestic interest rates, sale of foreign currency reserves, and devaluation of the currency. The Asian economies made a serious mistake in miscalculating their reserve needs relative to their short-term liabilities, and they seemed unwilling to raise domestic interest rates because of fears about the impact of higher interest rates on a highly debt-leveraged financial system. Particularly in Korea, the high rates of debt to equity left firms very vulnerable to major interest rate increases. Because of the stage of their liberalization programs, they also lacked the liquid short-term debt markets toward which stabilizing speculative inflows could have been directed.[15] Given that most of their foreign liabilities were denominated in foreign currencies, devaluation had the primary effect of greatly increasing the debt burden and raising concerns about solvency where none had previously existed.

The distinction between liquidity and solvency is particularly important for the IMF. In the debt crises, the Fund's involvement provided a seal of approval for debtor programs that enhanced the probability that creditors would be repaid. Periodic withdrawals under a stand-by agreement provided assurances that the debtor remained in compliance with its conditions. In a liquidity crisis the issues are quite different, and staged conditionality can be self-defeating if the purpose is to eliminate the rationale for a run on a currency.

---

[15]Exchange rate declines of the magnitude experienced in Asia should have generated expectations of a market rebound, but investors could not easily buy domestic securities that were free of private-sector default risks.

In the case of Mexico, the IMF, the United States, and others responded with a volume of short-term financing appropriate to a liquidity crisis. A large volume of funds was made available quickly and without significant conditions. As a result, Mexico needed to draw on only $30 billion of the total financial assistance package to stem the outflow during the first part of 1995, and by mid-year it had begun a repayment of the U.S. loan that was completed in early 1997. The IMF loan will largely be repaid by the year 2000. Mexico did experience a severe recession, but the assistance program averted a large-scale insolvency and permitted a relatively rapid recovery. The country also suffered a severe domestic banking crisis, due largely to borrowers' reduced capacity to repay loans, rather than direct currency losses.

In contrast to Mexico, the financing provided in Asia was stretched out into the future and strongly conditional on these countries achieving certain structural reforms. Given the lack of funds to address the liquidity concerns, the Asian economies were forced to let the exchange rate fall as the primary means of restoring a balance of supply and demand for their currencies; but at the cost of transforming a liquidity crisis into a solvency problem. They obtained some relief by guaranteeing the foreign loans of some private institutions and arranging their rescheduling.

The most immediate impact of a financial crisis is a sharp fall in domestic demand. Yet, as part of the financial assistance package, the Asian governments were encouraged to tighten fiscal policy -- negating the fiscal stabilizers -- and raise domestic interest rates to attract foreign finance. Thus, policy tended to amplify, rather than dampen the shock to domestic demand. If the crisis had been limited to a single country -- as in Mexico -- it might have been realistic to advocate a reliance on the external sector -- increased exports and reduced imports -- to promote recovery; but it will be more difficult to apply to an entire region. Asia will need to rely more heavily on expanding domestic demand.

In Asia, as in Mexico, the currency crisis will have its most severe effects on the banking system, and banking problems appear to be responsible for much of the contraction of domestic demand. Banks are directly affected by the devaluation-induced losses on their net foreign

currency exposure. In general, the Asian banks had a larger net exposure than in Mexico where the direct losses were relatively modest. Still, some of the foreign currency borrowing was undertaken by nonfinancial enterprises; and in the case of the bank borrowing, significant portions of the funds were re-lent in dollars. Thus, the problem of sharply higher debt costs is not restricted to the banking system; and the financial crisis is taking the form of sharp increases in non-performing loans as well as exchange rate losses. Most important, the banking system is a much larger intermediator of financial flows in Asia than in Mexico, and the problems of obtaining new loans will have a more substantial economic impact.

In devising policies to ameliorate the crisis in loan markets, it important to differentiate between the demand and supply aspects. On the demand side, the enterprises will have severe problems trying to manage a much larger interest rate burden on their existing debt. It is important to liquidate or merge insolvent enterprises quickly; but the measure of insolvency will depend greatly upon the presumed future value of the exchange rate and interest rates. If rates move back toward pre-crisis levels, some currently insolvent firms will be viable. For such firms, it is reasonable to provide some form of bridge financing; while adhering to a firm policy of liquidation for the deeply insolvent.

On the supply side, there is both a 'stock' and a 'flow' problem: the restructuring program must restore both the solvency and the profitability of the banking system. That process will be the most difficult and most costly aspect of the recovery. It will be doubly difficult as the governments need to integrate short-term programs of fiscal support and re-capitalization with the need to restructure and reform the financial system. There is a basic need to tighten prudential standards and require greater provisioning for impaired loans, but those measures will increase the apparent capital shortfall. The central bank will also come under strong pressures to expand liquidity through loans and reduced reserve requirements at a time when it is hard to distinguish between solvent and insolvent banks.[16] Despite the costs, past experience suggest

[16]A detailed review of past bank restructurings and some lessons from that experience are provided in Alexander and others (1997).

that it is important to act quickly with a comprehensive plan to resolve the banking problems. Otherwise private agents simply wait for more favorable terms from the government.

III. Systemic Problems

In a world of mobile financial capital, the threat of financial crises is likely to be a continual concern just as bank runs remain a concern in domestic financial systems. Looking ahead, international investing will take on some of the patterns that we now observe in the large financial centers. Individuals in many countries will desire to diversify their wealth across national boundaries, and the distinction between domestic and foreign investors will become meaningless. At the same time, modern tools of portfolio diversification tend to drive out knowledge: individual investors will adopt diversification and indexed funds as policies superior to undergoing the expense of learning about the countries in which they invest. Yet, those same investors will react strongly to news: any one country can be replaced in the portfolio by near-perfect substitutes. As a result, the threat of a run against a country's currency will remain substantial.

International Responses. Most countries try to control the risks of domestic bank runs by allowing the central bank to operate as a lender of last resort, but that is combined with a system of prudential supervision and regulation. At the international level, the IMF cannot be placed in the position of providing large-scale funds to countries threatened by a run on their currency when it has no effective means of overseeing their financial institutions and ensuring that their banks have prudent policies for managing risks. Such open-ended commitments are neither credible nor desirable.

Yet, a policy of laissez faire seems equally untenable. It is reasonable to stand aside from a market crisis when only willing participants are at risk, but that is not true of bank runs or currency crises. The externalities of these events are large both on others within the affected country, and on trading partners. Furthermore, non-intervention is preferable only if information flows are efficient and inexpensive, and if investors are rational and do not display

characteristics of herd behavior. There are also arguments for a policy centered around collective action. The crises of recent years are strongly suggestive of major contagion effects on others with similar circumstances. Significant savings could be achieved if countries pooled their assets as opposed to operating their own reserve funds.

One option would be to restrict the lender-of-last-resort to countries that previously qualified by meeting specific standards of quality in their prudential regulation, and maintaining reserves against short-term foreign exchange liabilities.[17] Both countries and investors would know if they met those standards. Analogous to the lender of last resort for banks, the objective should be to lend generously only for liquidity needs at a penalty rate. The problem of moral hazard would not seem to be that severe for participating countries because they would face extremely high costs if a crisis were to occur, even if they receive external assistance. The concern seems more legitimate for lenders, who tend to underestimate the risks, but even there moral hazard problems can be exaggerated as few lenders emerge unscathed. Most international lending institutions held a mixed portfolio in Asia: foreign currency loans, local currency loans, and direct market purchases. Their losses have been substantial.

However, there will be a strong objection from the industrial countries which have less need for a lender-of-last-resort. Their markets have greater depth and breadth, and they already have much of the infrastructure for an effective financial system in place. Furthermore, at least among the G-10, they already have their own internal system of providing short-term liquidity to one another. In addition, the enforcement and monitoring of the standards will be very difficult.

National Responses. It may be more realistic for individual developing countries to reassess their own policy options rather than relying on an international institution. The most striking feature of the recent crises is the extraordinary costs that countries pay for relatively small mistakes of policy. The current system of international financial markets is extremely

[17]One step in this direction would be to establish international standards for banks along the lines discussed in Goldstein (1997).

unforgiving, and it will take a decade or more of efficiency gains from market opening for the Asian economies to recover the costs of the current recession.

In this regard, it seems evident that the developing countries have been urged to open their financial markets with too little concern for the need to create a strong domestic financial system prior to establishing capital account convertibility. The lesson is not that countries should not do so, but that they need to be very concerned with the sequence of the financial liberalization (McKinnon, 1991). Financial openness requires a more sophisticated set of financial markets and institutions than those that typically operate domestically.

In part, financial openness may require a greater emphasis on markets as opposed to banks. Banks are often viewed as a preferable means of providing financial intermediation services --liquidity, project monitoring, and diversification -- in the initial stages of development. Through their close ties to enterprises, banks can obtain information at lower costs, and it is argued that they are more committed to long-term funding relationships. Initially, financial markets may lack the necessary breadth and depth, and the basis of a strong information system may be lacking.

A strong system of financial intermediation is most important to economies with a large number of rapidly-growing firms for which internally-generated funds fall short of their investment needs. While equity markets could provide intermediation services, it is a relatively small part of their function, and they are seldom a major source of investable funds. On the other hand, well-functioning markets do have the benefit of providing a more effective risk-sharing mechanism; and if information is available, it is dispersed more effectively through markets. Also, in the absence of financial markets, a bank run immediately translates into a currency crisis simply because there are so few domestic options. Still, Germany provides a strong example of an advanced economy that has been very successful with continuing an emphasis on financial intermediaries. In any case, a strong financial system can not be built over night, leaving a substantial intermediate period of risk.

As an interim policy, individual countries could hold larger reserves to protect themselves against a currency run. However, large reserve holdings eliminate much of the advantage of capital flows to recipient countries. They are unlikely to earn a return on their reserves equal to that paid to the foreign investors, and foreign currency set aside in reserves is not available to finance the inflow of capital goods from abroad. For the major emerging countries listed in table 1 and 4, total net inflows of financial capital totaled $512 billion in the period of 1990-95.[18] Of that amount, $292 billion -- more than half -- was set aside for reserve accumulation. That required an extraordinarily high return on the $220 billion of resources purchased from abroad -- the cumulative current account deficits -- if these countries were to profit from the borrowed funds. Admittedly the results are skewed by Singapore and China with particularly large reserve accumulations; but, even if they are excluded, 36 percent of the net financial inflow was held back as reserves.

Most recently, a currency board has been proposed as a solution to the potential for runs on the currency. Currency boards are attractive for countries that have lost credibility concerning their ability to manage their own currency, because of the interest rate premium they must pay to denominate loans in the local currency. The reasoning has normally applied to countries with a history of rampant inflation, not liquidity crises: a currency board eliminates the threat of a currency crisis, but at the cost of leaving the country exposed to a domestic financial crisis. If the move from a domestic financial asset to foreign currency is viewed as two transactions, the sale of the domestic asset for domestic currency and the subsequent purchase of foreign exchange, the second transaction occurs at an assured price, but the instability is simply transferred to the domestic currency price of the financial asset. In effect, there can be no lender-of-last-resort to head off domestic bank runs.

Still a third choice would be to move in the opposite direction, introducing more flexibility into the exchange rate. Under a fixed exchange rate system, countries mayhave a

[18]The calculations exclude Taiwan, a country with consistent current account surpluses and controls on capital inflows.

greater capability to respond to domestic liquidity problems than with a currency board; but a domestic crisis can easily degenerate into a currency crisis if the central bank tries to respond by creating unlimited amounts of domestic currency. On the other hand, a flexible exchange rate system leaves the central bank free to respond to domestic financial crises, while using changes in the exchange rate as the penalty for flights into foreign currency.[19] This is simply a corollary of the familiar argument that monetary policy can be directed toward internal stabilization or the external exchange rate, but not both.

Finally, countries can control some of the risks of a currency crisis by following the lead of countries such as Chile. Taxes on foreign-exchange transactions seem ineffective and unenforceable: the volatility of asset prices is not closely related to the costs of transactions. On the other hand, Chile has had success with monitoring and regulating the net currency exposure of its financial institutions and with measures that discourage short-term borrowing from abroad. While it has no significant restrictions on capital outflows, Chile is careful to limit the composition of the inflows. It has enforced a one-year holding period on foreign portfolio capital and direct investment, and a 30 percent reserve requirement against short-term bank liabilities to foreigners. While these controls may be avoidable at the margin, they have effectively limited Chile's foreign exposure without discouraging longer-term capital inflows. It has also used a tight fiscal policy to reconcile its need for restraint on domestic demand with a desire to avoid the high interest rates that would attract foreign capital. Chile operates with a crawling peg exchange rate, but in combination with a wide 10 percent band.

[19]Some of these options are explored more formally within the confines of a formal model in a recent paper by Chang and Velasco (1997). They also obtain the interesting result that a policy of high bank reserves is preferable to one of high foreign exchange reserves because the costs of the former are internalized within the banks.

Conclusion

The crises in Asia have served to highlight the dangers inherent in the current expansion of the international financial system. In the aftermath of the Mexican crisis, many economists pointed to its unique characteristics in arguing that it did not represent a systemic threat. That argument seems wrong today. Allowing the free flow of financial capital across national borders exposes countries to the inevitable risks of runs against their currencies, just as individual banks are threatened with runs domestically. Yet, the international community does not appear willing to provide the magnitude of funds required to support an effective lender-of-last-resort on a global basis. Developing countries need to manage the risks of capital market opening with an understanding that they will be forced to rely primarily on their own resources in the event of a crisis.

While the long-run objective should remain integration with the global financial system, the limited nature of financial markets and institutions in emerging markets suggests that the infrastructure to support such activities safely will take time to develop. These countries should give a high priority to financial system reform; but, in the meantime, they should adopt a policy of actively discouraging short-term capital inflows and carefully monitor the foreign currency exposure of domestic economic agents. They should view capital account convertibility as the last stange in a complex process of financial liberalization and growth.

References

Alexander, William E., Jeffrey M. Davis, Liam P. Ebrill, and Carl-Johan Lindgren (editors). 1997. *Systemic Bank Restructuring and Macroeconomic Policy*, Washington D.C: the International Monetary Fund.

Calvo, Guillermo A. 1995. "Varieties of Capital-Market Crises," Inter-American Development Bank Working Paper Series 306 (August).

Calvo, G., Morris Goldstein, Eduard Hochreiter (editors). 1996. *Private Capital Flows to Emerging Markets After the Mexican Crisis*, Washington D.C: Institute for International Economics and the Austrian National Bank.

Calvo, G., L. Liederman, and C.M. Reinhart. 1993. "Capital Inflows and Real Exchange Rate Appreciation: the Role of External Factors," *IMF Staff Papers*, 40:108-51.

Calvo, G. and Enrique Mendoza. 1996. "Mexico's Balance of Payments Crisis: A Chronicle of a Death Foretold," *Journal of International Economics* 41: 235-64.

Caprio, Gerard, and Daniela Klingebiel. 1996. "Bank Insolvency: Bad Luck, Bad Policy, or Bad Banking?" in Michael Bruno and Boris Pleskovic, *Annual World Bank Conference on Development Economics*, Washington D.C: the World Bank

Chang, Roberto, and Andres Velasco. 1997. "Financial Fragility and the Exchange Rate Regime," working paper, Federal Reserve Bank of Atlanta.

Cline, William R. 1995. *International Debt Reexamined*, Washington D.C: Institute for International Economics.

Diamond, Douglas W., and Philip H. Dybvig. 1983. "Bank Runs, Deposit Insurance, and Liquidity," *Journal of Political Economy*, 91, no.3: 401-19.

Dornbusch, Rudiger, Ilan Goldfajn, and Rodrigo O. Valdés, "Currency Crises and Collapses," *Brookings Papers on Economic Activity,1995:2*, 219-95.

Dziobek, Claudia, and Ceyla Pazarbasioglu. 1997. " Lessons From Systemic Bank Restructuring: a Survey of 24 Countries," IMF Working Paper 97/161.

Eichengreen, Barry, Andrew Rose, and Charles Wyplosz.1995. " Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks," *Economic Policy* 21: 249-312.

_____. 1996. "Contagious Currency Crises," NBER Working Paper 5681.

Enoch, Charles, and John H. Green (editors). 1997. *Banking Soundness and Monetary Policy*, Washington D.C: the International Monetary Fund.

Frankel, Jeffrey, and Andrew Rose. 1996. "Currency Crashes in Emerging Markets: An Empirical Treatment, *Journal of International Economics* 41: 351-66.

Gavin, Michael, and Ricardo Hausmann. 1996. "The Roots of Banking Crises: The Macroeconomic Context," Working Paper, Inter-American Development Bank.

Goldstein, Morris. 1997. *The Case for an International Banking Standard*. Washington D.C: Institute for International Economics.

International Monetary Fund. 1998. *International Financial Statistics*, Monthly CD-Rom, Washington D.C:

Kaminsky, Graciela L, and Carmen M. Rienhart. 1996. "The Twin Crises: the Causes of Banking and Balance-of-Payments Problems," International Finance Discussion Papers No. 544 (March), Washington D.C: the Board of Governors of the Federal Reserve System.

Kaminsky, Graciela L, Saul Lizondo, and Carmen M. Rienhart. 1997. "Leading Indicatiors of Currency Crises," IMF Working Paper 97/79, Washington D.C: the International Monetay Fund.

Krugman, Paul R. 1979. "A Model of Balance of Payments Crises," *Journal of Money, Credit, and Banking*, 11: 311-325.

_____. 1996. "Are Currency Crises Self-Fulfilling?" *NBER Macroeconomics Annual 1996*; 345-407.

Levine, Ross. 1997. "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*,35 (June): 688-726.

McKinnon, Ronald I. 1991. *The Order of Economic Integration*, Baltimore: John Hopkins Press.

Obstfeld, Maurice. 1986. "Rational and Self-Fulfilling Balance-of-Payments Crises," *American Economic Review*, (March): 72-81.

_____. 1994. "The Logic of Currency Crises," NBER Working Paper No.4640.
Republic of China, Council for conomic Planning and Development, *Taiwan Data Book*, 1997, Taipei.

Sachs, Jeffrey, Aaron Tornell and Andres Valasco. 1996. "Financial Crises in Emerging Markets: the Lessons From 1995," *Brookings Papers on Economic Activity, 1996:1*:147-215.

Sundararajan, V. And Tomás J.T. Baliño (editors). 1991. *Banking Crises: Causes and Issues*, Washington D.C: the International Monetary Fund.

Velasco, Andres. 1987. "Financial and Balance of Payments Crises: A Simple Model of the Southern Cone Experience," *Journal of Development Economics* 27:263-83.

Table 1. Indicators of Currency Risk, Major Emerging Markets, 1996

	GDP	Inflation	Budget Balance	Real Exchange	Current Account	External Debt			Reserves	Reserve Coverage/a
						Total	Total	Short-term		
	%	%	%GDP	1991-5=100	%GDP	% GDP	percent of exports		%Imp	%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Latin America										
Argentina	4.4	0	-2	102	-3.9	34	315	46	65	117
Brazil	2.9	11	-3.9	115	-3.3	25	306	94	80	97
Chile	7.2	7	2.2	113	-2.3	32	117	12	74	569
Colombia	2.1	21	-1.1	118	-4.7	30	164	27	57	213
Ecuador	2	24	-3	108	0.1	75	233	10	42	317
Mexico	5.1	34	0.4	92	-1.9	52	149	36	19	48
Peru	2.8	12	-1.4	106	-3.6	52	371	118	106	107
Venezuela	-1.6	100	1	113	8.8	53	133	9	79	492
Asia										
China	9.7	6	-1.5	--	0.9	18	80	19	69	304
India	6.9	7	-9.2	98	-1.3	28	181	32	43	118
Indonesia	7.8	8	1.4	105	-3.3	52	200	47	28	64
Korea	7.1	5	0	98	-4.9	26	80	43	19	45
Malaysia	8.2	4	4.2	106	-4.9	38	40	16	30	178
Philippines	5.5	8	-0.4	114	-4.7	65	132	34	25	69
Singapore	7	1	8.4	111	15	--	--	--	53	--
Taiwan	5.7	3	0.2	95	5.2	15	30	20	88	307
Thailand	6.4	6	1.6	108	-7.9	50	122	47	45	99

Source: International Monetary Fund and Morgan Guaranty Trust. Data refer to 1996.
a. The reserve coverage ratio is computed as the ratio of reserves to short-term liabilities.

Trade-weighted Real Exchange Rate
1990 = 100

	Dec-95	Dec-96	Jun-97	Dec-97	Jan-98
Hong Kong	116.0	125.5	130.3	140.7	142.1
Indonesia	100.5	105.1	105.7	61.4	30.1
Korea	87.8	86.8	85.2	58.1	50.1
Malaysia	107.0	111.8	116.4	84.5	74.6
Philippines	109.5	116.0	116.0	86.6	79.7
Singapore	112.7	117.9	117.5	114.0	112.8
Taiwan	90.4	89.3	91.0	89.1	85.3
Thailand	101.7	107.2	107.1	73.9	63.3

source: Morgan-Guaranty

Table 2. Index of Bank Financial Strength for Selected Countries, May 1996.
(Number of banks evaluated in parentheses)

Western Industrialized Countries		Asia		Eastern Europe	
Australia (12)	C+	China (5)	E+	Czech Republic (5)	D
Austria (7)	C	Hong Kong (7)	C+	Hungary (5)	D
Belgium (7)	B	India (6)	D	Poland (7)	D
Canada (10)	B	Indonesia (11)	D		
Denmark (3)	C+	Japan (49)	D		
Finland (4)	D	Korea (10)	D		
France (27)	C	Malaysia (1)	C+		
Germany (26)	C+	Philippines (9)	D+		
Italy (18)	C	Singapore (6)	B		
Luxemburg (3)	B	Taiwan, Province of China (5)	C		
Netherlands (5)	B+	Thailand (7)	D+		
Norway (4)	C				
Spain (12)	B	**Latin America**			
Sweden (5)	C	Argentina (10)	D+		
Switzerland (7)	B	Brazil (17)	D+		
United Kingdom (27)	C+	Chile (10)	C		
United States (296)	C+	Columbia (6)	C		
		Mexico (9)	E+		
		Panama (1)	C		
		Venezuela (5)	D		

Source: Moody's Investors Service; The index for each country is a simple average of the individual bank ratings. The scale runs from A to E (there is no A+).

Table 3. Bank Claims on the Private Sector

Percent of GDP

	Argentina	Brazil	Chile	Colombia	Ecuador	Mexico	Peru	Venezuela
1980			43		18	17		27
1981			51		20	17		27
1982			82		22	7		29
1983			74		27	10		31
1984			81		24	12		26
1985			68		22	11		26
1986			62		20	11		30
1987			57		20	12		30
1988			53		14	10		30
1989			48		11	16		21
1990	16		46	16	12	20	7	17
1991	12		44	13	14	26	6	18
1992	15		45	15	14	33	8	19
1993	17		49	18	17	33	9	16
1994	18	43	49	20	23	41	12	9
1995	18	29	51	21	27	31	14	9
1996	18	27	55	21	29	18	19	8

	China	India	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand
1980		22	10	42	38	31	71	30
1981		23	10	43	43	33	78	31
1982		25	14	47	47	33	83	34
1983		25	14	46	51	37	89	40
1984		26	16	46	53	24	89	44
1985		27	19	49	62	20	92	46
1986	77	28	22	49	72	15	88	44
1987	79	28	24	50	64	16	84	47
1988	75	27	29	48	61	16	79	51
1989	78	29	36	54	67	17	82	56
1990	88	27	51	57	71	19	82	64
1991	90	26	51	57	75	18	83	67
1992	88	27	49	57	75	21	85	72
1993	97	26	49	58	75	26	84	80
1994	90	25	52	60	75	29	84	92
1995	89	25	53	61	85	38	91	98
1996	--	--	55	66	92	48	96	100

Source: Monetary Survey, International Financial Statistics, line 32d

Table 4. Capital Inflows, Major Emerging Markets, 1990,1996
Billions of U.S. dollars

	Capital Inflows								Change in Reserves	
	Total Finance		Direct Investment		Portfolio Capital		Other Finance			
	1990	1996	1990	1996	1990	1996	1990	1996	1990	1996
Latin America										
Argentina	-6.3	16.3	1.8	4.2	-1.1	11.7	-7.0	0.5	-0.6	3.4
Brazil	-1.8	33.4	1.0	4.9	0.6	10.2	-3.4	18.4	-9.5	13.0
Chile	2.5	7.7	0.6	4.1	0.4	1.2	1.5	2.4	2.3	2.5
Colombia	0.1	8.0	0.5	3.3	0.0	1.7	-0.4	3.1	0.6	1.6
Ecuador	-0.7	1.1	0.1	0.4	0.0	0.0	-0.8	0.7	-1.0	-0.1
Mexico	17.1	10.6	2.5	7.6	3.4	14.2	11.2	-11.2	2.2	2.6
Peru	-1.3	3.6	0.0	3.6	0.0	0.3	-1.3	-0.3	-2.5	0.4
Venezuela	-0.9	0.5	0.5	1.8	15.0	0.9	-16.3	-2.2	1.0	7.0
Total	8.8	81.4	7.1	30.0	18.2	40.1	-16.5	11.3	-7.3	30.4
Asia										
China	4.6	43.8	3.5	40.2	0.0	2.4	1.1	1.3	12.0	31.7
India	6.1	5.2	0.0	2.1	0.0	1.6	6.1	1.4	-1.9	-0.7
Indonesia	4.5	11.0	1.1	4.3	-0.1	4.1	3.5	2.5	2.3	1.6
Korea	6.0	42.7	0.8	2.3	0.1	16.8	5.1	23.6	-1.2	1.4
Malaysia	2.0	6.9	2.3	4.1	-0.3	-0.4	-0.1	3.3	2.0	-1.8
Philippines	2.1	7.1	0.5	1.5	-0.1	2.6	1.6	3.0	0.0	1.2
Singapore	7.8	24.9	5.6	9.4	0.6	1.3	1.7	14.2	5.4	7.4
Taiwan	1.5	2.1	1.3	1.9	0.0	0.0	0.2	0.2	3.9	-1.1
Thailand	9.4	17.8	2.4	2.3	0.0	3.6	7.0	11.9	3.2	2.2
Total	44.0	161.6	17.6	68.2	0.2	31.9	26.2	61.5	25.6	41.9

Source: IMF(1998), and Republic of China (1997).