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Remarks by

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One way to address the issue of the management of foreign exchange reserves is to start with an economic system in which no reserves are required. There are two. The first is the obvious case of a single world currency. The second is a more useful starting point: a fully functioning, fully adhered to, floating rate world.

All requirements for foreign exchange in this idealized, I should say, hypothetical, system could be met in real time in the marketplace at whatever exchange rate prevails. No foreign exchange reserves would be needed.

If markets are functioning effectively, exchange rates are merely another price to which decisionmakers--both public and private--need respond. Risk-adjusted competitive rates of return on capital in all currencies would converge, and an optimized distribution of goods and services enhancing all nations' standard of living would evolve.

Only liquid reserves denominated in domestic currency would be required by public and private market participants. And in the case of a central bank of a fiat currency regime, such reserves can be created without limit.

But, clearly, the real world is not perceived to work that way. Even if it did, it is apparent from our post World War I history, that national governments are disinclined to grant currency markets unlimited rein. The distributions of income that arise in unregulated markets have been presumed unacceptable by most modern societies, and they have endeavored, through fiscal policies and regulation, to alter the outcomes.

In such environments it has been the rare government that has chosen to leave its international trade and finance to what it deems the whims of the marketplace.

Such attitudes very often are associated with a mercantilist view of trade that perceives trade surplus as somehow good, deficits bad. Since in the short run, if not in the long run, trade

balances are affected by exchange rates, rates that are allowed to float freely are few and far between. In a crisis, of course, monetary authorities are often overwhelmed, and lose any control of the foreign exchange value of their domestic currency. Most nations, for good or ill, have not been indifferent to the foreign exchange value of their currency. I say most, but not all.

Arguably, immediately following the dollar's float in 1973, U.S. authorities did not intervene and left it to others to adjust their currencies to ours. We did not sense a need to hold what we perceived to be weaker currencies in reserve because presumably we could always purchase them in the market, when, and if, the need arose. We held significant reserves in only that medium we judged a "harder" currency, that is gold.

It has become a general principle that monetary authorities reserve only those currencies they believe are as strong or stronger than their own. Thus, central banks' reserve balances except in special circumstances hold no weak currencies of which I am aware, other than standard transaction balances that are not viewed as stores of values.

We in the United States built up modest reserve balances of DM and yen only when we perceived that the foreign exchange value of the dollar was no longer something to which we could be indifferent, as when, in the late 1970s, our international trade went into chronic deficit, inflation accelerated, and international confidence in the dollar ebbed.

The choice of building reserves in a demonstrably harder currency is almost by definition not without costs in real resources. The budget cost of paying higher interest rates for the domestic borrowings employed to purchase lower yielding U.S. dollar assets, for example, is a transfer of real resources to the previous holders of the dollars. The real cost of capital because of risk is higher in a weaker currency country. Countries with weaker currencies apparently hold

hard currency reserves because they perceive that the insurance value of those reserves at least equal their cost in real resources. Reserves, like every other economic asset, have value but involve cost. Thus, the choice to build reserves, and in what quantities, is always a difficult cost-benefit tradeoff.

In general, the willingness to hold foreign exchange reserves ought to depend largely on the perceived benefits of intervention in the foreign exchange markets. An evaluation along these lines would appear to require a successful model of exchange rate determination, and a clear understanding of the influence of sterilized intervention. Both of the above have proved to be a challenge for the economics profession.

The two main policy tools available to monetary authorities to counter undesirable exchange rate movements are sterilized intervention operations in foreign exchange markets and monetary policy operations in domestic money markets.

Empirical research into the effectiveness of sterilized intervention in industrial country currencies has found that such operations have at best only small and temporary effects on exchange rates. One explanation for the limited measurable effectiveness of sterilized intervention is that the scale of typical operations has been insufficient to counter the enormous pressures that can be marshaled by market forces. In one sense, this is true by definition. Another is that the assets bought and sold in intervention operations are such close substitutes in the minds of investors that they willingly accept changes in the currency composition of their holdings without compensating changes in asset prices or exchange rates. A more recent strand of research into this topic claims that intervention operations can be effective when they signal future monetary policy operations, which are perceived to be more effective in altering asset

prices, including exchange rates. The problem with this view is that it means that sterilized intervention is not an independent tool that can be used to influence exchange rates. It needs a supporting monetary policy stance to be effective.

We are left with the conclusion that foreign exchange market-sterilized intervention by itself has only a limited impact on exchange rates. This is underscored by the reported intervention by Japanese authorities of roughly $20 billion against the yen in April of last year that barely budged the dollar/yen exchange rate.

Hence, reserve assets do not expand, in a meaningful way, the set of macroeconomic policy tools that is available to policy makers in industrial countries. In addition, there is scant evidence that the rapid development of new financial instruments and products has undermined the liquidity, efficiency, or reliability of the market for major currencies. U.S. monetary authorities have intervened only once in foreign exchange markets since August of 1995. It seems likely that industrial countries' official needs for foreign exchange reserves is more likely to have declined over time, than to have increased.

The introduction of the euro is clearly going to significantly alter reserve holdings. As markets for euro-denominated assets develop, the euro should become increasingly attractive as a world reserve currency. The bid-ask spreads on average of, say, the separate currency government bonds of the Euro-11 countries before January 1, were wider than the spreads on average that should eventually emerge for new euro-denominated issues. Such increased liquidity should reduce the cost of holding reserves, though conceivably the credit risk of bonds, not denominated in a currency fully controlled by a domestic central bank, would rise. To

some extent the increased attractiveness of the euro should reduce the demand for dollars. But history suggests that this effect is likely to be limited and evolutionary.

While the stock of foreign exchange reserves held by industrial countries has increased over time, those increases have not kept pace with the dramatic increases in foreign exchange trading or gross financial flows. Thus, in a relative sense, the effective stock of foreign exchange reserves held by industrial countries has actually declined.

In recent years volatility in global capital markets has put increasing pressure on emerging market economies, and this has important implications for financial management in those economies. There have been considerable fluctuations in the willingness of global investors to hold claims on these economies over the last two years. Between 1992 and 1997, yields on a broad range of emerging market debt instruments fell relative to those on comparable debt instruments issued by industrial country governments. But this pattern reversed sharply with the onset of the Asian financial crisis in the second half of 1997, and again following the ruble's devaluation in August of 1998.

These changes in foreign investors' willingness to hold claims on emerging market economies had a particularly severe impact on currencies operating under fixed or pegged exchange rate regimes. Accordingly, those countries' foreign exchange reserves, and reserve policy, played an important role in the recent financial crises.

In both Thailand and Korea the monetary authorities allowed their foreign exchange reserves, net of forward contracts and other obligations, to fall almost to zero. Once this became obvious to market participants, subsequent downward pressure on the baht and the won intensified substantially. In contrast, a number of countries (Taiwan and Singapore, for example)

introduced greater exchange rate flexibility without exhausting their foreign exchange reserves. These countries did not suffer the same violent downdrafts in their foreign exchange markets. In recent years Hong Kong, Taiwan, and China have all accumulated substantial stocks of foreign exchange. While the motives for these buildups were not all economic, they may have helped these economies to weather recent financial turbulence at less cost than other emerging market economies in the region.

The Asian crisis has focused attention on the adequacy of information about official reserves. In Thailand and Korea, in particular, limited disclosure of these data by the authorities contributed to misperceptions by market participants of resources available to the authorities to maintain the prevailing exchange rate regime. Moreover, once the crisis broke, inadequate data undermined efforts by the international financial community to resolve the situation.

In response, the G-10 central banks initiated an effort to establish standards for disclosure of on- and off-balance-sheet foreign currency activities of the public sector by countries that participate, or aspire to participate, in international capital markets. The focus of this work was the authorities' foreign currency liquidity position, which consists of foreign exchange resources that can be easily mobilized, adjusted for potential drains on those resources.

While greater disclosure is not a panacea for international financial crises, adherence to the standards developed in the wake of the 1997 crisis would go a long way toward preventing future stresses and facilitating responses to those that do occur. Some have argued that an equally important issue is a disclosure standard for private participants in international capital markets, especially highly leveraged entities. Such disclosure could be useful, and work on this

topic is proceeding. But progress on official disclosure should not be delayed pending the outcome of these efforts.

The Asian financial crises have reinforced the basic lesson that emerging market economies should pay particular attention to how they manage their foreign exchange reserves. But managing reserves alone is not enough. In particular, reserves should be managed along with liabilities--and other assets--to minimize the vulnerability of emerging market economies to a variety of shocks. In this context some simple principles can be outlined that are likely to be useful guidelines for policymakers. It may also be useful to consider somewhat more nuanced approaches to this problem.

Considerable progress has been made in recent years in developing sophisticated financial instruments. These developments create added complexity that all financial market participants, including policymakers from emerging market economies, must manage. However, they also create opportunities that emerging market economies should seek to exploit. In doing so there are lessons they can learn from advances in risk management strategies developed by major financial institutions.

In his remarks at the recent G-33 Seminar in Bonn, Pablo Guidotti, the Deputy Finance Minister of Argentina, proposed a simple guideline for policymakers in emerging market economies that a number of my colleagues at the Federal Reserve believe is worth considering. Guidotti suggested that countries should manage their external assets and liabilities in such a way that they are always able to live without new foreign borrowing for up to one year. That is, usable foreign exchange reserves should exceed scheduled amortizations of foreign currency debts (assuming no rollovers) during the following year. This rule could be readily augmented to

meet the additional test that the average maturity of a country's external liabilities should exceed a certain threshold, such as three years. The constraint on the average maturity ensures a degree of private sector "burden sharing" in times of crisis, since in the event of a crisis, the market value of longer maturities would doubtless fall sharply. Short-term foreign creditors, on the other hand, are able to exit without loss when their instruments mature. If the preponderance of a country's liabilities are short term, the entire burden of a crisis would fall on the emerging market economy in the form of a run on reserves.

Some emerging countries may argue that they have difficulty selling long-term maturities. If that is indeed the case, their economies are being exposed to too high a risk generally. For too long emerging market economies have managed their external liabilities so as to minimize the current borrowing cost. This short-sighted approach ignores the insurance imbedded in long-term debt, insurance that is often well worth the price.

The essential function of an external balance-sheet rule should be to make sure that actions of the government do not contribute to volatility in the foreign exchange market. Consequently it makes sense to apply the rule to all of the government's foreign assets and all sovereign liabilities denominated in, or indexed to, foreign currencies. Forward foreign exchange transactions should be recognized as liabilities, while such things as contingent credit lines, if they are truly available on demand, should be counted as foreign currency assets. In addition, key contingent liabilities should be included. This means that the foreign currency assets and liabilities of financial intermediaries that have access to the safety net--e.g., banks--probably ought to be included in the scope of the analysis.

It is important to note that adherence to such a rule is no guarantee that all financial crises can be avoided. If the confidence of domestic residents is undermined, they can generate demands for foreign exchange that would not be captured in this analysis. But controlling the structure of external assets and liabilities could make a significant contribution to stability.

The adoption of any rule is not a substitute for appropriate macroeconomic, exchange rate, and financial sector policies. Indeed, the endeavor to substitute such a regime for the more difficult fundamentals of sound policy will surely fail.

Countries that choose to follow this simple rule may reduce their vulnerability to financial crises. At a minimum this framework can highlight signs of vulnerability. For example, Korea's short-term debts, including those of Korean banks, were more than three times its foreign exchange reserves in December of 1996.

An external balance-sheet rule could generate substantial benefits for the international community as well. If followed, it would likely limit the size of future international rescue packages, since the size of such packages is often related to the size of a country's short-term liabilities less its reserves. In applying any simple rule, it is important to anticipate endeavors to get around it. For example, the IMF has identified more than $30 billion in outstanding emerging market debt instruments with put options. This suggests that maturity calculations ought to eschew notional maturities that would not prevail in times of crisis.

In any event, it would probably be desirable to move beyond simple balance-sheet rules and to work towards a standard that is stochastic, i.e., that takes into account the foreseeable risks that countries face. One approach would be to calculate a country's liquidity position under a range of possible outcomes for relevant financial variables (exchange rates, commodity prices,

credit spreads, etc.). It might be possible to express a standard in terms of the probabilities of different outcomes. For example, an acceptable debt structure could have an average maturity--averaged over estimated distributions for relevant financial variables--in excess of a certain limit. In addition, countries could be expected to hold sufficient liquid reserves to ensure that they could avoid new borrowing for one year with a certain ex ante probability, such as 95 percent of the time.

Such a "liquidity-at-risk" standard could handle a wide range of innovative financial instruments--contingent credit lines with collateral such as the one maintained by Argentina, options on commodity prices, put options on bonds, etc.--in an appropriate manner. Such a standard would encourage countries to manage their exposure to financial risk more effectively. For example, such a standard could force countries to think realistically about the cost of selling put options with their bonds.

Of course, this approach will not work if policymakers are committed to the letter, but not the spirit, of the exercise. There is no credible way to fully preclude a counterproductive effort to gain costless benefits with new financial products that convert long-term liabilities to short.

Clearly it would not be feasible at present for most emerging market countries to implement a policy regime based on liquidity at risk. It might not even be feasible for most emerging market economies to adhere to a more simple external balance-sheet rule, since many countries will require some time to build up foreign exchange reserves, and to adjust the structure of their external liabilities. It is almost certainly desirable, however, for countries to begin to think about managing their assets and liabilities, or just monitoring their vulnerabilities, in a more sophisticated way. An external balance-sheet rule is probably a good place to start.

Over the medium term, it would be desirable for emerging market economies to develop a more sophisticated approach to the problem of managing their liquidity. There is an obvious connection between "value-at-risk" techniques used by large financial institutions to manage their exposure to risk and the liquidity-at-risk approach proposed here. It would be productive were those large financial institutions to play a role in helping countries develop their own capabilities to implement this approach, perhaps with technical assistance from G-7 supervisory authorities and international financial institutions.