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Remarks by  
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at the  
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It is a pleasure to address this conference on risk management once again. The conference has consistently been an interesting and constructive one. I regret that I cannot attend in person.

As I have noted previously--and, indeed, as is evident to everyone who attends a conference like this--the global financial system has been evolving rapidly in recent years. New technology has radically reduced the costs of borrowing and lending across traditional national borders, facilitating the development of new instruments and drawing in new players. One result has been a massive increase in capital flows. Information is transmitted instantaneously around the world, and huge shifts in the supply and demand for funds naturally follow.

This burgeoning global system has been demonstrated to be a highly efficient structure that has significantly facilitated cross-border trade in goods and services and, accordingly, has made a substantial contribution to standards of living worldwide. Its efficiency exposes and punishes underlying economic weakness swiftly and decisively. Regrettably, it also appears to have facilitated the transmission of financial disturbances far more effectively than ever before. The crisis in Mexico several years ago was the first such episode associated with our new high-tech international financial system. The current Asian crisis is the second.

We do not as yet fully understand the new system's dynamics. We are learning fast, and need to update and modify our institutions and practices to reduce the risks inherent in the new regime. This morning, I should like to offer an analysis of the origins and nature of the Asian crisis and of some implications for risk management--with respect both to systemic risk and to the risks facing individual financial firms.

Companies in Korea and many other Asian countries have become formidable world-class producers in a number of manufacturing sectors using advanced technologies, but in a number of cases--relying on government guarantees, explicit or implicit--they permitted leverage to rise to levels that could only be sustained with continued very rapid growth. Growth, however, was destined to slow.

Asian economies to varying degrees over the last half century have tried to combine rapid growth with a much higher mix of government-directed production than has been evident in the essentially market-driven economies of the West. Through government inducements, a number of select, more sophisticated manufacturing technologies borrowed from the advanced market economies were applied to these generally low-productivity and, hence, low-wage economies.<sup>1</sup> Thus, for selected products, exports became competitive with those of the market economies. This engendered rapid overall economic growth at a rate far exceeding that of economies at the cutting edge of technology, whose growth has been bound by hard-fought, but slow, accretions to knowledge.

There was, however, an upper limit defined by that cutting edge as to how far this specialized Asian economic regime could develop. As the process broadened beyond a few select applications of advanced technologies, *overall* productivity continued to increase and the associated rise in the *average* real wage in these economies blunted somewhat the competitive advantage enjoyed initially. Slackening of export growth was inevitable. In addition, losses in competitiveness as a result of exchange rates that were pegged to the

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<sup>1</sup> Wage levels in an industry are largely driven by the average wage level of all workers in an economy against whom the industry's workers compete.

dollar, which has appreciated against the yen since early 1995, slowed aggregate economic growth somewhat, even before the current crisis developed

For years, domestic savings and rapidly increasing capital inflows had been directed by governments into investments that banks were required to finance. Lacking market signals that are required to shape productive investment, much of that investment was unprofitable. So long as growth was vigorous, the adverse consequences of this type of non-market allocation of resources were masked. Moreover, in the context of pegged exchange rates that were presumed to continue, if not indefinitely, at least beyond the term of the loan, banks and nonbanks were willing to take the risk to borrow dollars (unhedged) to obtain the dollar-denominated interest rates that were invariably lower than those available in domestic currency. Western, especially American, investors diversified some of their huge capital gains of the 1990s into East Asian investments. In hindsight, it is evident that those economies could not provide adequate profitable opportunities at reasonable risk to absorb such a surge in funds. This surge, together with distortions caused by government planning, has resulted in a huge misallocation of resources.

With the inevitable slowdown, business losses and nonperforming bank loans surged. Banks' capital eroded rapidly and, as a consequence, funding sources have dried up, as fears of defaults have risen dramatically. In an environment of weak financial systems, lax supervisory regimes, and vague guarantees about depositor or creditor protections, bank runs have occurred in several countries and reached crisis proportions in Indonesia. Uncertainty and retrenchment have escalated. The state of confidence so necessary to the functioning of any economy has been torn asunder. Vicious cycles of ever rising and reinforcing fears have

become contagious. Some exchange rates have fallen to levels that are understandable only in the context of a veritable collapse of confidence in the functioning of an economy. It is clear, for example, that neither changes in the relative purchasing power of the Indonesian rupiah, nor the relevant interest rates, can explain the more than four-fifths decline in the rupiah relative to the U S dollar by early 1998.

The sharp exchange rate changes in East Asia in recent months, as similar instances elsewhere, do not appear to have resulted wholly from a measured judgment that fundamental forces have turned appreciably more adverse. More likely, its root is a process that is neither measured nor rational, one based on a visceral, engulfing, fear. The exchange rate changes appear the consequences, not of the accumulation of new knowledge of a deterioration in fundamentals, but of its opposite: the onset of uncertainties that destroy previous understandings of the way the world works. That has induced massive disengagements of investors and declines in Asian currencies that have no tie to reality. In all aspects of life, when confronted with uncertainty, people tend to withdraw.

A similar breakdown was also evident in Mexico three years ago, albeit to a somewhat lesser degree. In late 1994, the government was rapidly losing reserves in a vain effort to support a currency that had come under attack when the authorities failed to act expeditiously and convincingly to contain a burgeoning current account deficit financed in large part by substantial short-term flows denominated in dollars.

These two recent crisis episodes have afforded us increasing insights into the dynamics of the evolving international financial system, though there is much we do not yet understand.

With the new more sophisticated financial markets punishing errant government policy behavior far more profoundly than in the past, vicious cycles are evidently emerging more often. For once they are triggered, damage control is difficult. Once the web of confidence, which supports the financial system, is breached, it is difficult to restore quickly. The loss of confidence that one understands the dynamics of the systems with which we are engaged can trigger rapid and disruptive changes in the pattern of finance, which, in turn, feed back on exchange rates and asset prices. Moreover, investor concerns that weaknesses revealed in one economy may be present in others that are similarly situated means that the loss of confidence can quickly spread to other countries.

At one point the economic system appears stable, the next it behaves as though a dam has reached a breaking point, and water (read, confidence) evacuates its reservoir. The United States experienced such a sudden change with the decline in stock prices of more than 20 percent on October 19, 1987. There is no credible scenario that can readily explain so abrupt a change in the fundamentals of long-term valuation on that one day. Such market panic does not appear to reflect a simple continuum from the immediately previous period. The abrupt onset of such implosions suggests the possibility that there is a marked dividing line for confidence. When crossed, prices slip into free fall--perhaps overshooting the long-term equilibrium--before markets will stabilize.

But why do these events seem to erupt without some readily evident precursor? Certainly, the more extended the risk-taking, or more generally, the lower the discount factors applied to future outcomes, the greater the proportion of current output (mainly capital goods) driven by perceived future needs. Hence, under such conditions the more vulnerable are

markets to a shock that abruptly triggers a revision in expectations of future needs and sets off a vicious cycle of contraction of financial and product markets

Episodes of vicious cycles cannot be easily forecast, as our recent experience with Asia has demonstrated. Certainly, there were indications that Thailand's large current account deficits were unsustainable. Once the recent crisis was triggered in early July with Thailand's eventual forced abandonment of its exchange rate peg, it was apparently the lethal combination of pegged exchange rates, high leverage, weak banking and financial systems, and declining demand in Thailand and elsewhere that transformed a correction into a collapse.

Normally the presence of these factors would have produced a modest retrenchment, not the kind of discontinuous fall in confidence that leads to a vicious cycle of decline. But with a significant part of short-term liabilities, bank and nonbank, denominated in dollars or other foreign currencies, unhedged, the initial pressure on domestic currencies was apparently too much to bear, leading to a sharp crack in the fixed exchange rate structure of many East Asian economies. The belief that local currencies could, virtually without risk of loss, be converted into dollars at any time was shattered. Investors, both domestic and foreign, endeavored en masse to convert to dollars, as confidence in the ability of the local economy to earn dollars to meet their fixed obligations diminished. Local exchange rates fell against the dollar, inducing still further declines.

The weakening of growth also led to lowered profit expectations and contracting net capital inflows of dollars. This was an abrupt change from the pronounced acceleration through 1996 and the first half of 1997. The combination of continued strong demand for dollars to meet debt service obligations and the slowed new supply destabilized the previously

fixed exchange rate regime. This created a marked increase in uncertainty and retrenchment, further reducing capital inflows, still further weakening local currency exchange rates. This vicious cycle will continue until either defaults or restructuring lowers debt service obligations, or the low local exchange rates finally induce a pickup in the supply of dollars.

These virulent episodes appear to be at the root of our most recent breakdowns in Mexico and Asia. Their increased prevalence may, in fact, be a defining characteristic of the new high-tech international financial system. We shall never be able to alter the human response to shocks of uncertainty and withdrawal, we can only endeavor to reduce the imbalances that exacerbate them.

As indicated earlier, I do not believe we are as yet sufficiently knowledgeable of the full complex dynamics of our increasingly developing high-tech financial system. However, enough insights have been gleaned from the crises in Mexico and Asia (and previous experiences) to enable us to list a few of the critical tendencies toward disequilibrium and vicious cycles that have all, in times past, been factors in international and domestic economic disruptions, but that appear more stark in today's market.

Certainly in Korea, probably in Thailand and Indonesia, and possibly elsewhere, a high degree of leverage (the ratio of debt to equity) appears to be a place to start. Exceptionally high leverage often is a symptom of excessive risk-taking that leaves financial systems and economies vulnerable to loss of confidence. It is not easy to imagine the cumulative cascading of debt instruments seeking safety in a crisis when assets are heavily funded with equity. The concern is particularly relevant to banks and many other financial intermediaries, whose assets typically are less liquid than their liabilities and so depend on confidence in the



payment of liabilities for their continued viability Moreover, both financial and nonfinancial businesses can employ high leverage to mask inadequate underlying profitability and otherwise have inadequate capital cushions to match their volatile environments

Excess leverage in nonfinancial business can create problems for lenders including their banks, these problems can, in turn, spread to other borrowers that rely on these lenders Fortunately, since lending by nonfinancial firms to other businesses is less prevalent than bank lending to other banks, direct contagion is less likely But the leverage of South Korea's chaebols, because of their size and the pervasive distress, has clearly been an important cause of bank problems with their systemic implications

Banks, when confronted with a generally rising yield curve, have a tendency to incur interest rate or liquidity risk by lending long and funding short This exposes them to shocks, especially those institutions that have low capital-asset ratios When financial intermediaries, in addition, seek low-cost, unhedged, foreign currency funding, the dangers of depositor runs, following a fall in the domestic currency, escalate

Banks play a crucial role in the financial market infrastructure When they are undercapitalized, have lax lending standards, and are subjected to weak supervision and regulation, they become a source of systemic risk both domestically and internationally

Despite its importance for distributing savings to their most valued use, short-term interbank funding, especially cross border, may turn out to be the Achilles' heel of an international financial system that is subject to wide variations in financial confidence This phenomenon, which is all too common in our domestic experience, may be particularly dangerous in an international setting

An important contributor to past crises has been moral hazard. The expectation that monetary authorities or international financial institutions will come to the rescue of failing financial systems and unsound investments clearly has engendered a significant element of moral hazard and excessive risk-taking. The dividing line between public and private liabilities, too often, becomes blurred.

Weak central banks also have been a contributor to crises. To effectively support a stable currency, central banks need to be independent, meaning that their monetary policy decisions are not subject to the dictates of political authorities. In East Asia, as in many other areas, the central bank was not in a position to resist political pressures focused on the short run.

In addition, recent adverse banking experiences have emphasized the problems that can arise if banks are almost the sole source of intermediation. Their breakdown induces a sharp weakening in economic growth. A wider range of nonbank institutions, including viable debt and equity markets, are important safeguards of economic activity when banking fails.

Finally, an effective competitive market system requires a rule of law that severely delimits government's arbitrary intrusion into commercial disputes.

Defaults and restructuring will not always be avoidable. Indeed "creative destruction," as Joseph Schumpeter put it, is often an important element of renewal in a dynamic market economy. But an efficient bankruptcy statute is required to aid in this process, including in the case of cross-border defaults.

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How should these critical tendencies toward disequilibrium and vicious cycles be addressed if the global economy is to limit the scope for disruptions in the future? What does the prevalence of these elements say about systemic risk and about risk incurred by individual firms?

The management of systemic risk, of course, is beyond the scope of individual institutions. While interest and currency risk-taking, excess leverage, and interbank funding represent decisions by individual firms, such decisions, as well as the weakness of financial systems, are all encouraged by the existence of a safety net. In a domestic context, it is difficult to achieve financial balance without a regulatory structure that seeks to simulate the market incentives that would tend to control these financial elements if there were not broad safety nets. It is even more difficult to achieve such a balance internationally among sovereign governments operating out of different cultures. Thus, governments have developed a patchwork of arrangements and conventions governing the functioning of the international financial system.

I believe that what is being referred to as the architecture of the international financial system will need to be thoroughly reviewed and altered as necessary to fit the needs of the new global environment. However, what we have in place today to respond to crises should be supported even as we work to improve those mechanisms and institutions.

As a consequence of the unwinding of market restrictions and regulations, and the rapid increase in technology, the international financial system has expanded at a pace far faster than either domestic GDP or cross-border trade. To reduce the risk of systemic crises in such an environment, an enhanced regime of market incentives, involving greater

sensitivity to market signals, more information to make those signals more robust, and broader securities markets--coupled with better supervision--is essential. Obviously appropriate macropolicies, as ever, are assumed.

Nonetheless, it is reasonable to expect that despite endeavors at risk containment and prevention the system may fail in some instances, triggering vicious cycles and all the associated contagion for innocent bystanders. A backup source of international financial support provided only with agreed conditions to address underlying problems, the task assigned to the IMF, can play an essential stabilizing role. The availability of such support must be limited because its size cannot be expected to expand at the pace of the international financial system. I doubt if there will be worldwide political support for that.

The policy conditionality, associated principally with IMF lending, which dictates economic and financial discipline and structural change, helps to mitigate some of the moral hazard concerns. Such conditionality is also critical to the success of the overall stabilization effort. Convincing a sovereign nation to alter destructive policies that impair its own performance and threaten contagion to its neighbors is best handled by an international financial institution, such as the IMF.

With respect to private financial institutions, risks that are incurred reflect fundamentally the institutions' attitude toward risk and their internal risk management procedures. However, market discipline and official supervision and regulation, especially with respect to those financial institutions that are supported by the public safety net, provide some constraints on individual firms' behavior. Elements of the recent crises in Mexico and

Asia that I have pointed to suggest several aspects of risk management and supervisory practices that deserve to be highlighted

In this rapidly expanding international financial system, the primary protection from adverse financial disturbances is effective counterparty surveillance and, hence, government regulation and supervision should seek to produce an environment in which counterparties can most effectively oversee the credit risks of potential transactions

Here a major improvement in transparency, including both accounting and public disclosure, is essential. To be sure, counterparties often exchange otherwise confidential information as a condition of a transaction. But broader dissemination of detailed disclosures of governments, financial institutions, and firms is required if the risks inherent in our global financial structure are to be contained. A market system can approach an appropriate equilibrium only if the signals to which individual market participants respond are accurate and adequate to the needs of the adjustment process. Among the important signals are product and asset prices, interest rates, debt by maturity, detailed accounts of central banks, and private enterprises. Blinded by faulty signals, a competitive free-market system cannot reach a firm balance except by chance. In today's rapidly changing marketplace producers need sophisticated signals to hone production schedules and investment programs to respond to consumer demand.

One element of added transparency that ought to be considered is the need for more complete and more frequent information on bank lending and other risk exposures. We must be sensitive to the costs of putting additional reporting burdens on financial institutions. However, it might be for the benefit of those institutions themselves, as well as of the

international financial community more generally, if the aggregate exposures of creditors and obligors--both on and off the balance sheet--were better understood

Secondly, we have seen that assets that firms thought were of good quality and to some extent liquid turned out not to be so when the economic and financial environment changed abruptly. Such miscalculations reflect, among other things, inadequate credit analysis, lack of adequate portfolio diversification, poor evaluation of collateral or lack of access to that collateral, or presumptions of official support that were not warranted, perhaps because the authorities did not have the resources to provide that support.

Lack of a cadre of loan officers who have experience in judging lending risk can produce debilitating losses even when lending is not directed by government inducement, or the need to support members of an associated group of companies. Experienced bank supervision and regulation cannot fully substitute for poor lending procedures, but presumably it could encourage better practice. Apparently even that has been lacking in many emerging economies.

Reliance on real estate for collateral has proven to be problematic. Not only can real estate values fall sharply in certain adverse situations, but at the same time such collateral becomes highly illiquid. Removal of legal impediments to more widespread forms of collateral and to prompt access to collateral would be helpful.

It is becoming increasingly evident that nonperforming loans should be dealt with expeditiously. The expected values of the losses on these loans are, of course, a subtraction from capital. But since these estimates are uncertain, they embody an additional risk premium that reduces the markets' best estimate of the size of effective equity capital even if

capital is replenished. It is, hence, far better to remove these dubious assets and their associated risk premium from bank balance sheets, and dispose of them separately, preferably promptly.

Use of internal models for risk analysis, and as the basis for regulatory capital charges, has become common so far as market risk is concerned. While the limits of models, and the importance of the assumptions that must be made to put them to use, have been reasonably well understood, those issues have been brought into sharp focus by the Asian crisis. For example, firms now appreciate more fully the importance of the tails of the probability distributions of the shocks and of the assumptions about the covariance of price changes. The use of stress tests, which address the implications of extreme scenarios, has properly increased.

Use of models for credit analysis is less widespread, but some progress is being made on that score as well. Over time, as credit risk analysis and risk management processes in general become more sophisticated, the framework for regulation and supervision, including the framework for capital charges, will need to adapt to, and take advantage of, evolving risk management practices.

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Eventually, the Asian economies now suffering from the current crisis will recover. If the proper policies are pursued and there is support from the international community, the process of recovery can begin soon and the structural reforms necessary for more durable growth will be underway. But the lessons from the Asian crisis will remain with us, as the lessons from previous crises have remained. It is important that national and international

officials and private individuals learn these lessons now and take advantage of that knowledge, so that we will not have to relearn these lessons in the future