

ASIA AND THE GLOBAL FINANCIAL CRISIS

Asia Economic Policy Conference

Sponsored by the
Federal Reserve Bank of San Francisco

ASIA AND THE GLOBAL FINANCIAL CRISIS

Edited by

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Mark M. Spiegel

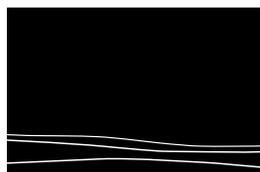
Asia Economic Policy Conference

Sponsored by the
Federal Reserve Bank of San Francisco

Santa Barbara, California
October 19–20, 2009

The articles in this publication can be obtained in electronic form from the
Federal Reserve Bank of San Francisco's website:

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Foreword

This year's Asia Economic Policy Conference, titled "Asia and the Global Financial Crisis," is the first in a series that the Federal Reserve Bank of San Francisco plans to hold every other year. Our objective is to bring together researchers, private market participants, and policymakers to explore Asia's evolving role in the global economy. We hope that this conference series will provide a useful arena for interaction, with opportunities for both formal and informal discussion. We also hope to stimulate more top-quality research on Asian issues.

We decided to begin this venture for several reasons. First and foremost, it goes without saying that Asia is an important force in the global economy. We consider knowledge of the region critical in insuring that the Federal Reserve System has the understanding of global economic trends needed to conduct monetary policy and to address issues relating to the stability of the financial system. Not surprisingly, given the strength of economic and financial ties between Asia and the western United States, the Federal Reserve Bank of San Francisco has a long-standing tradition of focusing on Asian developments through the activities of our Center for Pacific Basin Studies in our Economic Research Department and our Country Analysis Unit in Banking Supervision and Regulation.

This year's conference assembled an outstanding group of experts on a topic of extreme importance. I appreciate the contributions of all those who took part in the conference, including authors, discussants, panelists, and audience members. My special thanks to John Judd, Reuven Glick, and Mark Spiegel, who helped develop the program, and to Anita Todd for her assistance with the production of this volume.



Janet L. Yellen

President and CEO, Federal Reserve Bank of San Francisco

Asia and the Global Financial Crisis: Conference Summary

Reuven Glick and Mark M. Spiegel

The global financial crisis of 2007–09 has starkly demonstrated the extent to which the economic fortunes of the United States, Asia, and the rest of the world are intertwined. The crisis was transmitted to industrial and emerging market economies through both financial and trade channels. Investors were affected by exposure to failing assets in the United States and increased uncertainty in global financial markets. Emerging market economies experienced abrupt halts in capital inflows and downward pressure on their exchange rates. Exporters throughout the world saw demand for their products decline. While Asian economies were initially perceived to be insulated from developments elsewhere, the notion of Asia “decoupling” from the problems in the United States and Europe evaporated as the crisis intensified. Policymakers around the world faced the tasks of stabilizing financial conditions and managing economic growth in the short run as well as adopting long-run reforms aimed at preventing future crises.

To explore these issues, the Federal Reserve Bank of San Francisco inaugurated its Asia Economic Policy Conference series with a conference on “Asia and the Global Financial Crisis” held October 19-20, 2009, in Santa Barbara, California. The conference brought together experts from around the world to discuss the transmission of the crisis to Asia and the responses of economic policymakers and regulators. The conference program consisted of five commissioned papers and other presentations by distinguished speakers.

In opening remarks, Federal Reserve Chairman Ben Bernanke noted that, in the aftermath of the financial crisis of the late 1990s, many emerging market economies in Asia and elsewhere took advantage of improved global conditions to strengthen their economic and financial fundamentals. They bolstered fiscal and foreign debt positions, accumulated foreign exchange reserves, and reformed their banking sectors. When financial turmoil erupted in the summer of 2007, Asian economies were well-positioned to avoid its worst effects. In particular, most financial institutions in the region were not heavily exposed to distressed markets for structured credit products and other asset-backed securities.

Still, Asian nations were affected in late 2007 and 2008 when economies weakened in the United States and other industrial countries. The global financial crisis intensified dramatically when Lehman Brothers failed in September 2008. As investor appetite for risk declined, capital flows shifted away from countries that were viewed as more vulnerable. Moreover, financial institutions withdrew money from risky assets in both advanced and emerging markets. The Federal Reserve established liquidity swap lines with central banks in Asia and other regions to help alleviate dollar funding pressures.

In Bernanke's view, emerging Asia's sound macroeconomic and financial fundamentals provided room for maneuver in carrying out countercyclical monetary and fiscal policy, in contrast with earlier crises or compared with options available to other emerging market countries. In particular, China implemented a sizable fiscal program, supplemented by accommodative monetary and bank lending policies. Bernanke attributed Asia's relatively rapid recovery in large part to such domestic demand-boosting policies, which provided a substitute for exports to trading partners outside the region.

First-day presentations reviewed national experiences of the crisis. Morris Goldstein and Daniel Xie of the Peterson Institute for International Economics identified several characteristics that affected the depth of the downturn among Asian countries. China and India experienced relatively small growth slowdowns, but the economies of Hong Kong, Korea, Singapore, and Taiwan contracted sharply, on par with the recessions they experienced during the financial crisis of 1997–98.

Declining demand for imports among advanced economies transmitted the crisis to export-reliant Asian countries. And, compared with most other emerging market regions, emerging Asia was more sensitive to declines in U.S. asset prices. On the other hand, emerging Asia benefited because it had not increased its exposure to banks in the advanced countries in the decade preceding the crisis. Developing Asian countries also relied more than other emerging market regions on foreign direct investment inflows. And Asian economies were not heavily exposed to U.S. subprime loans. Goldstein and Xie also argued that Asian countries largely avoided the combustible mix of large currency depreciations and adverse mismatches in the currency denominations of assets and liabilities. Recent experience in emerging Europe underscores the exposure to risk when currency and maturity mismatches are not controlled.

Anne Krueger of Johns Hopkins University drew out several lessons from the experiences of Japan and Korea during the 1997–98 financial crisis. First, policymakers must choose an exchange rate regime compatible with monetary and fiscal policy. Unless policymakers are willing to subordinate monetary and

fiscal policy to the demands of a fixed exchange rate regime, a flexible exchange rate is preferable. Second, mismatches between banking assets and liabilities must be avoided. When their currency denominations differ, unhedged positions are vulnerable to exchange rate movements. Third, short-term debt should not exceed foreign exchange reserves.

Krueger noted that delays in addressing financial problems are costly. The extent to which authorities implement policies forcefully and quickly is an important determinant of the speed of recovery. Krueger emphasized that authorities must recapitalize financial institutions and see to it that nonperforming loans are addressed. Fiscal stimulus can boost growth in the short term, as it did in Japan in 1996. However, this response is likely to be temporary and full recovery unsustainable as long as the financial system remains impaired. In addition, official credibility and transparency are crucial. Uncertainty about the health of financial institutions can prolong and deepen crises.

Maurice Obstfeld, University of California, Berkeley, and Kenneth Rogoff, Harvard University, argued that, although global imbalances in trade and capital flows didn't cause the crisis, they were generated by some of the same underlying factors and they amplified its magnitude. Excessively stimulatory U.S. monetary policy combined with low global interest rates, credit market distortions, and problematic financial innovations led to a housing bubble. At the same time, exchange rate and other economic policies of emerging market countries such as China helped the United States borrow cheaply abroad to finance its bubble. To limit future global imbalances, Obstfeld and Rogoff suggested policies to improve domestic financial market efficiency in less-developed economies, where structural shortcomings tend to boost corporate and household saving rates. They also proposed stronger global financial market regulation, including more extensive international cooperation.

In a keynote address, Andrew Crockett, president of JPMorgan Chase International, argued that the crisis showed that market failures are more widespread and problematic than previously believed. In the future, the global financial system is likely to continue to be market driven, but regulation will play a more substantial role. Crockett foresaw a fragmented institutional structure, with various international regulatory bodies playing roles alongside established international financial institutions, such as the International Monetary Fund. Asian countries are likely to have a larger voice, consistent with their growing economic clout.

In day two of the conference, presentations concentrated on policy responses to the global financial crisis. Takatoshi Ito of the University of Tokyo reviewed the challenges faced by policymakers in advanced countries during the crisis

and evaluated their policy responses, including the U.S. Treasury's liquidity provision program and the Federal Reserve's monetary easing policies. He drew comparisons with the actions of the Japanese Ministry of Finance and the Bank of Japan during that country's 1997 financial crisis, which also started with the failure of a major financial institution, Hokkaido Takushoku Bank. It was also marked by the Bank of Japan's "quantitative easing" monetary policy after interest rates reached the zero bound, similar to the Federal Reserve's balance sheet expansion in 2008 and 2009.

Ito argued that the March 2008 forced sale of Bear Stearns indicated that the crisis had become sufficiently severe that the stability of the entire financial system was at risk. Moreover, the rescue of Bear Stearns, combined with the lack of an explicit framework for the resolution of failed nonbank financial institutions, led investors to believe that other troubled financial institutions, such as Lehman Brothers, were also privy to similar assistance, magnifying the shock when Lehman Brothers was allowed to go under. Ito also argued that, in the immediate aftermath of the Lehman failure, U.S. authorities squandered an opportunity to impose a tough financial recovery program, which would have reduced taxpayer losses. He concluded that actions taken by policymakers during the crisis appeared to have prevented the worst outcomes, but financial conditions would have improved more rapidly if U.S. regulators had moved quickly to shut down troubled institutions early in the crisis.

A panel of Asian policymakers delivered remarks concerning their countries' crisis experiences. Heng Swee Keat, Managing Director of the Monetary Authority of Singapore, noted that the impact of the global financial crisis showed Asia's "deep integration" with the rest of the world, putting to rest the theory that nations in the region had decoupled from the global economy. Asian nations experienced a severe and highly synchronized collapse in trade, with exports within Asia plummeting almost 50 percent. This decline was substantially steeper than the nearly 30 percent decline in exports to the United States and Western Europe. This led to difficulties in Asian financial markets as well. Average sovereign credit default swap spreads increased more than threefold in several economies, and stock prices fell by more than 60 percent. However, Heng noted that Asian monetary and financial systems proved resilient, thanks partly to reforms enacted following the 1997–98 Asian financial crisis, including regulations encouraging Asian investors to avoid currency mismatch exposure. He argued that the relative good fortune of China, India, and Indonesia in avoiding recession was partly attributable to their greater reliance on domestic demand, while the more open economies of Asia were harder hit. Indeed,

increases in domestic demand from the region, particularly China, played an important role in the region's relatively rapid recovery.

Heng acknowledged that countries in Asia probably will have to accept lower economic growth rates in the future, as it has been demonstrated that the rapid growth in external demand enjoyed by the region over the previous decade is unsustainable. He concluded that adjustment to this reality will require greater reliance on domestic demand within the region. To achieve this goal the region needs to continue its structural reform efforts, including enhancing investor protection, promoting infrastructure investment, and enhancing regional trade and financial integration. He also acknowledged that currency flexibility was an important vehicle for facilitating structural adjustments and correcting global imbalances, but he noted that exchange rate adjustments were unlikely to eliminate global imbalances on their own.

Kyungsoo Kim, Deputy Governor of the Bank of Korea, discussed his country's experiences during the crisis. On the surface, Korea appeared to be equipped to weather these shocks because it had accumulated a substantial cushion of official reserves and had implemented extensive liberalization measures in response to the disruptions suffered during the 1997–98 Asian financial crisis. These measures improved regulatory conditions in Korea's financial system and limited the exposure of Korean banks to U.S. subprime assets at the onset of the recent global financial crisis. However, Korea experienced substantial capital outflows at the beginning of the crisis that resulted in downward exchange rate pressure. After the Lehman Brothers failure, Korean authorities responded by taking steps to ensure the liquidity of domestic financial markets, including the establishment of a \$30 billion swap arrangement with the Federal Reserve. It used these funds, along with its own stock of foreign hard currency reserves, to inject liquidity into its financial system.

Kim's discussion highlighted the difficulties associated with procyclical capital inflows in small open economies and the need to manage capital account openness so as to avoid excessive swings in credit conditions. After the onset of the crisis, Korea's private financial system faced severe currency and maturity mismatch difficulties and experienced capital outflows despite the government's guarantee of bank debt and its willingness to draw down some of its stock of foreign currency reserves. He concluded that the crisis reveals that, while capital account openness can bring benefits, it needs to be managed to avoid excessive procyclical swings in credit conditions. He noted that using foreign reserves to manage procyclical short-term borrowing may raise moral hazard issues if government-financed hedging of risk encourages too much private short-term

borrowing. In the end, he argued that regulation must align the incentives of private borrowers with the public interest.

Takafumi Sato, former Commissioner of Japan's Financial Services Agency, discussed Japan's experience and policy responses. Comparing the effects of the recent crisis with the impact of that country's financial troubles of the 1990s, he noted that the recent crisis was less damaging to Japanese financial markets because the problems originated outside Japan. In contrast, the Japanese financial system had played a major role in the buildup of vulnerabilities going into the 1997 crisis. By and large, Japanese banks were generally less exposed to securitized assets than their U.S. and European counterparts. In addition, the reforms undertaken by Japan in response to the previous crisis allowed for a quicker response. Nevertheless, the Japanese financial system was not immune to this crisis, as risks were transmitted internationally through a variety of financial instruments, and some individual Japanese banks did have notable exposure. Moreover, the crisis hit Japan particularly hard as its exports plummeted.

Japanese regulators took steps to maintain the functioning and liquidity of financial markets, preserve financial sector soundness, and sustain bank lending by, for example, authorizing government and central bank purchases of commercial paper and implementing other liquidity provisions. Still, Sato noted that the magnitude of the Japanese response has fallen short of that undertaken by Western governments, mainly because Japan's difficulties in this crisis were the results of external shocks and did not necessarily warrant extensive domestic reforms in response. Consequently, Japan's policy response has been primarily focused on mitigating the short-term cyclical downturn of the economy.

Following the panel, Barry Eichengreen of the University of California, Berkeley, outlined global policy reforms that should be implemented in light of the crisis. He cited two primary causes of the crisis: excessive deregulation and global imbalances that fueled an unsustainable U.S. credit boom.

On the issue of excessive deregulation, Eichengreen argued that financial institutions had incentives that prompted them to take on ever greater levels of risk, particularly as managers within these institutions were motivated to maximize short-term compensation. Moreover, regulators lacked the resources to assess the severity of financial system vulnerability accurately. In addition, lenders made inadequate efforts to evaluate asset risk because they followed an originate-to-distribute business model that left them with little exposure, while rating agencies lacked the capacity to value complex instruments and faced conflicts of interest in doing so. Eichengreen's policy prescriptions included regulations requiring reduced leverage, incorporation of off-balance-sheet items

into financial assessments, creation of resolution mechanisms for nondepository institutions, enhancement of regulatory agency resources, as well as addressing problems in derivatives markets by requiring originators of debt to maintain more “skin in the game” to better align their incentives with investors and creating an agency responsible for macroprudential oversight.

Concerning the role of global imbalances, Eichengreen concluded that monetary policy makers should pay attention to these imbalances, even in cases when inflation is absent and countries can borrow in their own currency. In borrowing countries, policymakers should address fiscal policy procyclicality, which seems to have exacerbated the severity of global imbalances. In lending countries, reserve accumulation should be less aggressive because building up these reserves could lead to imbalances of the magnitude that preceded the crisis. Finally, Eichengreen argued that relative prices need to be adjusted to deal with changes in the pattern of demand. This can happen through either nominal exchange rate adjustment or inflation, although exchange rate adjustment is likely to be less disruptive.

In a closing address, International Monetary Fund Deputy Managing Director John Lipsky noted that while the beginnings of an economic recovery were apparent, the global economy remained in an exceptionally difficult and challenging period. Ensuring economic recovery would require continued international collaboration. He criticized the notion that Asian nations had decoupled from the global economy, as the pace of recovery from the crisis appeared to be most robust in the countries that were most integrated with the rest of the world. He also argued that recovery in the region reflected quick and forceful policy responses, which were aided by the strong economic fundamentals enjoyed by Asian nations going into the global crisis. Lipsky stressed that recovery was still in its early stages in Asia, and policy support should be maintained until the recoveries of the Asian economies were secure.

WELCOME ADDRESS

Asia and the Global Financial Crisis

Ben S. Bernanke

The rise of the Asian economies since World War II has been one of the great success stories in the history of economic development. Japan's transition to an economic powerhouse was followed by the rapid ascent of the Asian tigers, and subsequently by China taking a prominent place on the world economic stage.¹ Since the beginning of this decade, Asia has accounted for more than one-third of the world's economic growth, raising its share of global gross domestic product (GDP) from 28 percent to 32 percent.² Importantly, its economic success has resulted in large-scale reductions in poverty and substantial improvements in the standards of living of hundreds of millions of people. China and India, which together account for almost 40 percent of the world's population, have seen real per capita incomes rise more than tenfold and threefold, respectively, since 1980. As would be expected given the increasing size and sophistication of their economies, the nations of the region have also begun to exert a substantial influence on global economic developments and on international governance in the economic and financial spheres.

It is widely agreed that a key source of Asia's rapid advancement has been the openness of countries in the region to global trade and finance. Notwithstanding this consensus, the considerable progress of these countries in developing domestic institutions, policies, and industrial capacity—together with their strong growth in the initial phase of the ongoing global financial crisis—led some to speculate that the Asian economies had “decoupled” from the advanced economies of North America and Europe. Of course, in hindsight, given the magnitude of the shocks that have struck these advanced economies over the past two years, as well as their strong economic and financial links to Asia, it should not have been surprising that Asia was ultimately hit quite hard by the global downturn, even though the origins of the turmoil were elsewhere.

As a prelude to the papers and discussions to follow, I will provide a brief overview of the Asian experience during the global financial crisis. I will highlight the diversity of experiences, both within Asia and between Asia and other regions, and draw some inferences about the different channels through which the effects of the financial crisis were transmitted around the world. I will discuss Asia's policy response to the economic and financial consequences of the

crisis. Finally, I will focus on medium-term challenges. For both Asia and the United States, perhaps the greatest medium-term challenge is to achieve more balanced growth and, in the process, to further reduce global imbalances.

Asia's Experience in the Crisis

During the years following the financial crisis of the late 1990s, many emerging market economies, in Asia and elsewhere, took advantage of relatively good global economic conditions to strengthen their economic and financial fundamentals; they improved their fiscal and external debt positions, built foreign exchange reserves, and reformed their banking sectors. Hence, at the onset of the financial turmoil in the summer of 2007, the Asian economies appeared well-positioned to avoid its worst effects. Although global financial markets, including Asian markets, deteriorated sharply following the start of the crisis, Asia's recovered swiftly, with equity prices reaching new highs early in the fourth quarter of that year. Moreover, economic activity in the region continued to expand.

However, toward the end of 2007, at about the same time that the United States entered a recession, the headwinds facing the Asian economies appeared to strengthen. Asian equity markets began to fall again—they were to underperform global markets throughout much of 2008—and other signs of financial stress, such as widening credit spreads, appeared as well. By the second quarter of 2008, many of the region's economies were slowing, and growth in Hong Kong, Singapore, and Taiwan—small, open economies particularly sensitive to shifts in global conditions—had ground to a halt.

In September and October 2008, as you know, the global financial crisis intensified dramatically. Concerted international action prevented a global financial meltdown, but the effects of the crisis on asset prices, credit availability, and consumer and business confidence resulted in sharp declines in demand and production worldwide. Reflecting this worsening economic climate, Asian GDP growth slowed further in the second half of 2008. For the region as a whole, the economic contraction in the fourth quarter of 2008 was pronounced, with activity falling at an annual rate of nearly 7 percent.³ The fourth-quarter declines were especially dramatic in Taiwan and Thailand (more than 20 percent at an annual rate) and in South Korea and Singapore (more than 15 percent at an annual rate). Among the major Asian economies, only those of China, India, and Indonesia did not contract during the crisis.

Early this year, with many of the Asian economies in freefall, a quick recovery seemed difficult to imagine, but recent data from the region suggest that a strong rebound is, in fact, under way. Although the regional economy continued

to contract in the first months of 2009, it expanded at an impressive 9 percent annual rate in the second quarter, with annualized growth rates well into double digits in China, Hong Kong, Korea, Malaysia, Singapore, and Taiwan.⁴ At this point, while risks to the economic outlook certainly remain, Asia appears to be leading the global recovery.

Diversity of Experiences

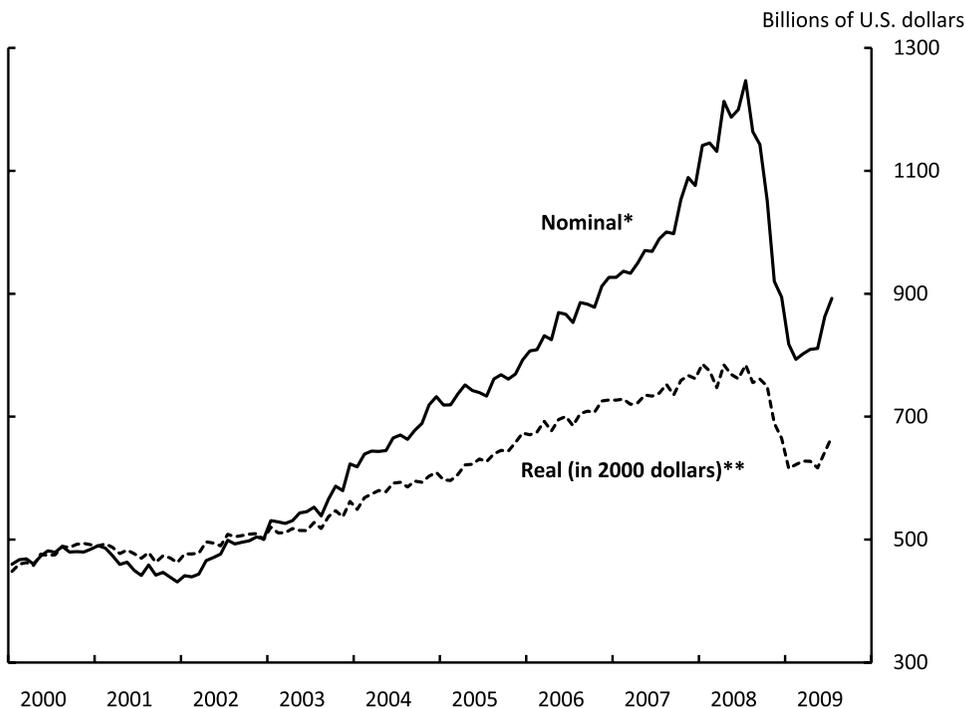
This brief review of Asia's experience during the crisis raises a number of important questions: Through what channels were the effects of the financial crisis transmitted across the globe? In particular, why was Asia, whose financial systems largely escaped the serious credit problems that erupted in the United States and Europe, hit so hard by the global recession? What enabled the Asian economies to bounce back so sharply more recently? And why did some countries—around the world and within Asia—suffer much deeper contractions than others? Some light can be shed on these questions by examining the diversity of experiences among both Asian and non-Asian economies during the downturn.

Transmission Channels: Trade and Finance

The crisis that began in the West affected Asia through various transmission channels, whose relative importance depended in some degree on the particular characteristics of each economy. However, for virtually all of the Asian economies, international trade appears to have been a critical channel. Exhibit 1 shows the course of global merchandise exports since the beginning of this decade. As the exhibit shows, after a period of strong growth, international trade plunged about 20 percent in real terms from its pre-crisis peak to its trough in early 2009 (the dashed line), and about 35 percent in U.S. dollar terms (the solid line).⁵ The trade-dependent economies of Asia could certainly not be immune to the effects of such a decline.

Why did global trade fall so abruptly? The severe recession in the advanced economies greatly restrained aggregate spending, including spending on imports, but the decline in international trade appears surprisingly large even when the depth of the recession in the advanced countries is taken into account. One possible explanation for the outsized decline in trade volumes lies in the extreme uncertainty that prevailed in the darkest months of the crisis. Consumers and businesses knew last fall that economic conditions were poor, but, in light of the severity and the global nature of the financial crisis, many feared outcomes that might be much worse. Perhaps to a greater extent than they might have otherwise, households and firms put off purchases of big-ticket

EXHIBIT 1
Global Merchandise Exports



*The nominal data are the sum of the total merchandise exports of 44 economies, including the United States, expressed in U.S. dollars.

**The real data are calculated by deflating dollar-value nominal exports by export price indexes constructed from local-currency deflators drawn from country sources and dollar exchange rates.

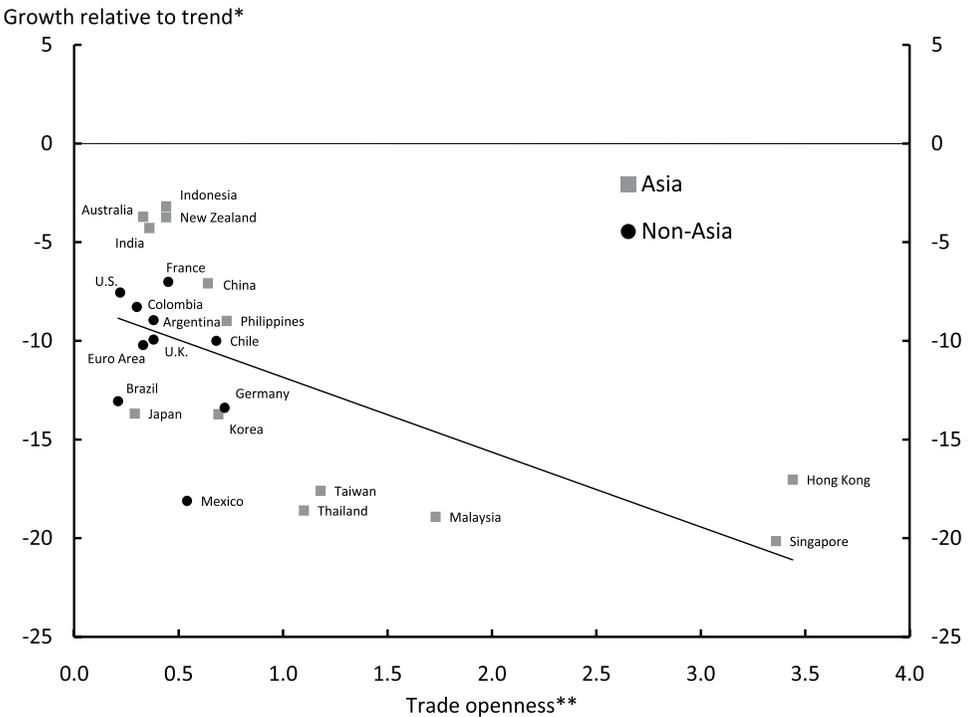
Source: CEIC, Haver, and staff estimates.

items, such as consumer durables and investment goods. Durable goods figure prominently in trade and manufacturing, so these sectors may have been particularly vulnerable to the elevated uncertainty and weakened confidence that prevailed during the height of the crisis.

Credit conditions also likely affected the volume of trade, through several channels. The turmoil in credit markets doubtless exacerbated the sharp decline in demand for durable goods, and thus in trade volumes, as purchases of durable goods typically involve some extension of credit. Manufacturing production, a major component of trade flows, may have been cut back more sharply than would otherwise have been the case as producers, concerned about credit availability, attempted to preserve working capital. Finally, although it is difficult to assess the size of the effect, problems in obtaining trade finance may have also impeded trade for a time.

With trade falling sharply around the world, economies particularly dependent on trade were hit especially hard. Exhibit 2 illustrates this point for a group of Asian and non-Asian economies. The vertical axis of the figure shows real GDP growth, measured relative to trend, during the most severe stage of the downturn, and the horizontal axis shows a measure of openness to trade.⁶ Combinations of growth and openness observed in various economies are indicated by gray squares for a number of Asian countries and by black dots for several non-Asian countries. The exhibit shows that countries most open to trade (those located further to the right in the figure) suffered, on average, the greatest declines in growth relative to trend. The most extreme cases are Hong Kong and Singapore, shown to the far right; the economies of Korea, Taiwan,

EXHIBIT 2
Trade Openness and GDP Growth
 (2008:Q4–2009:Q1)



*Growth relative to trend is the percentage point difference between the realized rate of growth during 2008:Q4 and 2009:Q1, measured at an annual rate, and trend growth. Trend growth is the average annualized growth rate during 2006 and 2007 of smoother gross domestic product (GDP) using the Hodrick-Prescott filter.

** $(\text{Exports} + \text{Imports}) / \text{GDP}$ in 2007.

Source: CEIC, Haver, and staff estimates.

Thailand, and Malaysia, which are also very open, suffered significant growth deficits as well.

Indeed, the GDP contractions in some Asian economies during that period rivaled those during the Asian financial crisis of the late 1990s. Relative to pre-crisis trend, the six Asian economies just mentioned plus Japan experienced declines in real GDP growth of about 13 to 20 percentage points at an annual rate during the last quarter of 2008 and the first quarter of 2009. Growth fell somewhat less severely in the Philippines and only moderately in Australia and New Zealand. As noted earlier, real GDP growth remained positive throughout the crisis in China, India, and Indonesia, but, as Exhibit 2 shows, even those fast-growing economies experienced noticeable declines in growth relative to their earlier trends. The exhibit shows that a similar relationship between growth and openness to trade holds for non-Asian countries; for example, more trade-dependent nations like Germany saw sharper declines in output during the crisis than other less-open economies.

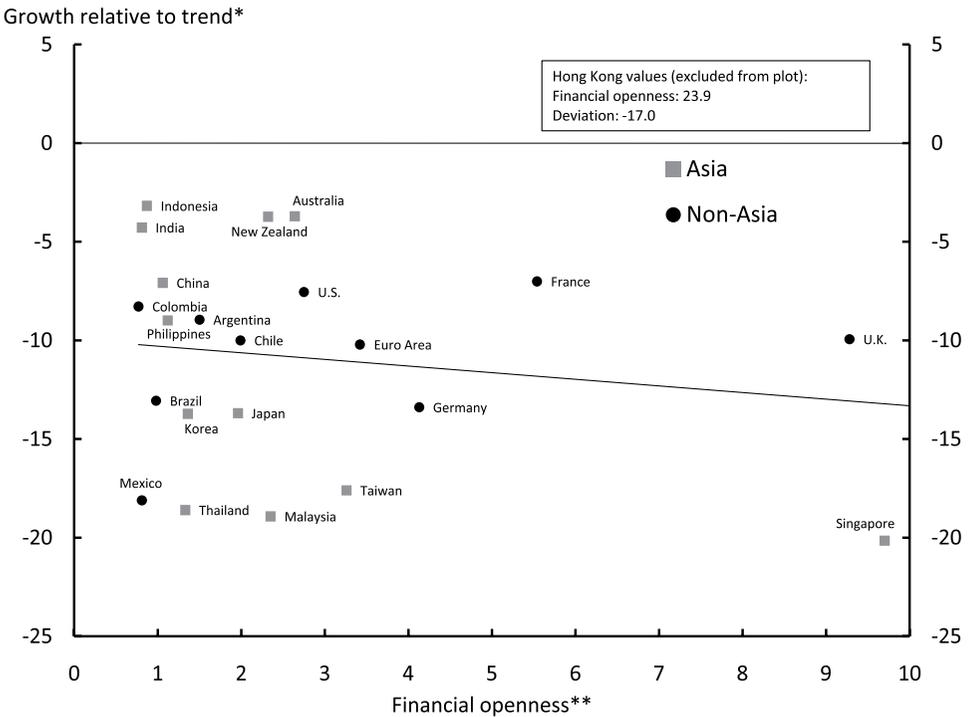
Variations across countries in trade openness do not fully explain the diversity of growth experiences during the downturn, suggesting that other factors were also at work. Notably, although financial institutions in emerging market economies were not, for the most part, directly affected by the collapse of the market for structured credit products and other asset-backed securities, financial stress nevertheless affected these countries. As international investors' appetite for risk evaporated, the flow of capital shifted away from countries that had historically been viewed as more vulnerable, including some emerging Asian and Latin American economies, even though many of these countries appeared to be much better positioned to weather an economic crisis than in the past. Moreover, regardless of perceived risks, financial institutions pulled money from risky assets in advanced and emerging markets alike in an effort to strengthen their balance sheets.

Following the reversal in capital flows engendered by the crisis, strains in banking appeared across Asia, leading to severe credit tightening in some countries. Fears of counterparty risk disrupted interbank lending in many countries, intensifying already existing funding difficulties. The drying up of the wholesale funding market hurt Korea's banking system in particular; prior to the crisis, it had accounted for about one-third of Korean bank funding. In Japan, some banks' exposures to equity markets damaged their capital positions. With Asian banks experiencing dollar funding pressures similar to those arising elsewhere in the world, the Federal Reserve established 5 of its 14 liquidity swap lines with central banks in the region: Australia, Japan, Korea, New Zealand, and Singapore. The reversal in capital flows also caused rapid

exchange rate depreciation in some countries, particularly Korea, Indonesia, and Malaysia. The Korean won depreciated 40 percent against the dollar from the beginning of 2008 through its trough in March of this year, and it has only partially recovered. Over the same period, the Indonesian rupiah fell 22 percent against the dollar.

Exhibit 3 shows the relationship between rates of GDP growth during the downturn, relative to trend, and financial openness, as measured by the sum of each country's international assets and liabilities relative to its GDP.⁷ The exhibit shows that, for both Asian and non-Asian economies, financial openness was associated with greater declines in output, though the linkage appears somewhat less tight than that for trade.⁸ Again, the most extreme cases are

EXHIBIT 3
Financial Openness and GDP Growth
(2008:Q4–2009:Q1)



*Growth relative to trend is the percentage point difference between the realized rate of growth during 2008:Q4 and 2009:Q1, measured at an annual rate, and trend growth. Trend growth is the average annualized growth rate during 2006 and 2007 of smoother gross domestic product (GDP) using the Hodrick-Prescott filter.

** $(\text{International Assets} + \text{Liabilities}) / \text{GDP}$ in 2007.

Source: CEIC, Haver, and staff estimates. International investment position data are from Haver and the U.S. Bureau of Economic Analysis.

Singapore and especially Hong Kong (which is not shown, as it is more than twice as open as even Singapore). Taiwan is another example of a financially open Asian economy that experienced a particularly severe downturn. By the same token, China, India, and Indonesia, the three Asian countries in which output expanded throughout the crisis, are among the least financially open.

Trade and financial channels influenced other emerging markets as well, such as those in Latin America and Eastern Europe. Many of these economies also contracted sharply, but thus far they have recovered more slowly than economies in Asia. In the case of Latin America, closer links to the U.S. economy (especially in the case of Mexico) and greater dependence on commodity exports (whose prices declined during the most intense phase of the crisis) were additional sources of weakness. In Eastern Europe, preexisting macroeconomic imbalances and structural weaknesses likely magnified the effects of the adverse global shocks.

It is important not to take the wrong lesson from the finding that more open economies were more severely affected by the global recession. Although tighter integration with the global economy naturally increases vulnerability to global economic shocks, considerable evidence suggests that openness also promotes stronger economic growth over the longer term. Protectionism and the erecting of barriers to capital flows should thus be strongly resisted. Instead, as I will discuss, striking a reasonable balance between trade and growth in domestic demand is the best strategy for driving economic expansion.

Policy Responses

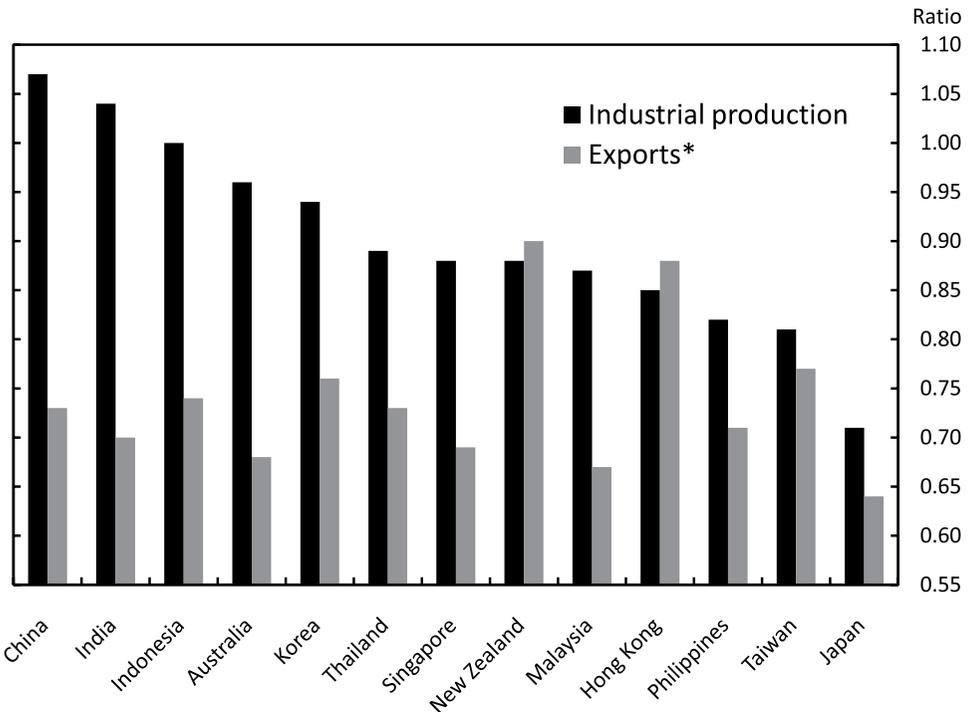
By and large, countries in Asia came into the crisis with fairly strong macroeconomic fundamentals, including low inflation and favorable fiscal and current account positions. Good fundamentals, in turn, provided scope for strong policy responses in many countries. China, Japan, Korea, and Singapore were among those employing relatively aggressive policy strategies; in particular, China undertook a sizable fiscal program, supplemented by accommodative monetary and bank lending policies. The stimulus packages in China and elsewhere have lifted domestic demand throughout the region, boosting intraregional trade.

Not all Asian nations responded so aggressively to the crisis. Some countries with weaker fiscal positions no doubt felt constrained in the extent of fiscal stimulus they provided. Similarly, monetary policies were likely influenced by differences in inflation performance. On the one hand, countries experiencing low inflation or deflation, such as China, Japan, and Thailand, were able to implement expansionary monetary policies without concerns about increasing inflationary pressures. Indeed, Japan used unconventional monetary easing

in part to avoid deeper deflation. On the other hand, inflation concerns were more pressing for Indonesia, the Philippines, and Korea, with the result that their monetary policy responses may have been more muted than would otherwise have been the case. The national variation in policy responses likely also reflected differences in the severity of the crisis across countries.

Generally speaking, the Asian response to the crisis appears thus far to have been effective. Importantly, as I have suggested, the Asian recovery to date has been in significant part the result of growth in domestic demand, supported by fiscal and monetary policies, rather than of growth in demand from trading partners outside the region. To illustrate the point, for each of the countries in the region, Exhibit 4 shows industrial production (black bars) and exports (gray bars) measured relative to the pre-crisis peak.⁹ You can see that the black bars are generally taller than the gray bars, indicating that, except for New Zealand and Hong Kong, industrial production has rebounded by more than exports. Indeed, industrial production in China, India, and Indonesia has

EXHIBIT 4
Asian Industrial Production and Exports Relative to Pre-Crisis Peak



*Exports are measured in U.S. dollars. Industrial production and export data are through the second quarter of 2009.
Source: CEIC, Haver, and staff estimates.

already reached new highs, and it is within about 5 percent of its previous peak in Australia and Korea. We would expect to see this pattern if growth in domestic demand, rather than growth in exports, was the predominant driver of increases in domestic production.¹⁰ The revival of demand in Asia has, in turn, aided global economic growth.

Despite the initial successes of Asian economic policies, risks remain. As in the advanced economies, unwinding the stimulative policies introduced during the crisis will require careful judgment. Policymakers will have to balance the risks of withdrawing policy support too early, which might cut short a nascent recovery, against the risks of leaving expansionary policies in place for too long, which could overheat the economy or worsen longer-term fiscal imbalances. In Asia, as in the rest of the world, the provision of adequate short-term stimulus must not be allowed to detract from longer-term goals, such as the amelioration of excessive global imbalances or ongoing structural reforms to increase productivity and support balanced and sustainable growth.

Lessons from Crises and Medium-Term Challenges

For now, Asian countries look to be weathering the current storm. In part, their successful responses reflect the lessons learned during the Asian financial crisis of the 1990s, including the need for sound macroeconomic fundamentals.

One crucial lesson from both that crisis and the recent one is that financial institutions must be carefully regulated, transparent, and sufficiently well capitalized and liquid to withstand large shocks. In part because of the reforms put in place after the crisis of the 1990s, along with improved macroeconomic policies, Asian banking systems were better positioned to handle the more recent turmoil. With the increased prominence of the Group of Twenty (G-20) as a forum for discussing the global responses to the crisis, emerging market economies, including those in Asia, will play a larger role in the remaking of the international financial system and financial regulation.

Another set of lessons that Asian economies took from the crisis of the 1990s may be more problematic. Because strong export markets helped Asia recover from that crisis, and because many countries in the region were badly hurt by sharp reversals in capital flows, the crisis strengthened Asia's commitment to export-led growth, backed up with large current account surpluses and mounting foreign exchange reserves. In many respects, that model has served Asia well, contributing to the rapid growth rates in the region over the past decade. In fact, it bears repeating that evidence from the world over shows trade openness to be an important source of economic growth. However, too great a reliance on external demand can also pose problems. In particular, trade surpluses

achieved through policies that artificially enhance incentives for domestic saving and the production of export goods distort the mix of domestic industries and the allocation of resources, resulting in an economy that is less able to meet the needs of its own citizens in the longer term.

To achieve more balanced and durable economic growth and to reduce the risks of financial instability, we must avoid ever-increasing and unsustainable imbalances in trade and capital flows. External imbalances have already narrowed substantially as a consequence of the crisis, as reduced income and wealth and tighter credit have led households in the United States and other advanced industrial countries to save more and spend less, including on imported goods. Together with lower oil prices and reduced business investment, these changes in behavior have lowered the U.S. current account deficit from about 5 percent of GDP in 2008 to less than 3 percent in the second quarter of this year. Reflecting in part reduced import demand from the United States, China's current account surplus fell from about 10 percent of GDP in the first half of 2008 to about 6½ percent of GDP in the first half of this year.

As the global economy recovers and trade volumes rebound, however, global imbalances may reassert themselves. As national leaders have emphasized in recent meetings of the G-20, policymakers around the world must guard against such an outcome. We understand, at least in principle, how to do this. The United States must increase its national saving rate. Although we should deploy, as best we can, tools to increase private saving, the most effective way to accomplish this goal is by establishing a sustainable fiscal trajectory, anchored by a clear commitment to substantially reduce federal deficits over time. For their part, to achieve balanced and sustainable growth, the authorities in surplus countries, including most Asian economies, must act to narrow the gap between saving and investment and to raise domestic demand. In large part, such actions should focus on boosting consumption. Admittedly, just as increasing private saving in the United States is challenging, promoting consumption in a high-saving country is not necessarily straightforward. One potentially effective strategy is to reduce households' precautionary motive for saving by strengthening pension systems and increasing government spending on health care and education. Of course, such measures are likely to improve welfare and productivity as well as to contribute to more balanced, robust, and sustainable economic growth.

Conclusion

The United States has benefited significantly from Asia's rapid development and integration into the global economy, and the payoffs to the Asian economies

from global economic integration have been substantial as well. Indeed, the financial crisis has starkly demonstrated the extent to which the fortunes of the United States, Asia, and the rest of the global economy are intertwined. These powerful economic linkages, as well as the importance of both the United States and Asia in the global economy, underscore the need for consultation and cooperation in addressing common issues and concerns. Our shared stakes in the prospects of the global economy bring with them a heightened responsibility to work together to maintain those prospects. I am optimistic that the United States and Asia will rise to the challenge and address in a mutually beneficial fashion the range of issues confronting the global economy. Conferences such as this one, which bring together policymakers and scholars from both sides of the Pacific, will further the cause of this cooperation.

NOTES

1 The term “Asian tigers” refers to the economies of Hong Kong, Singapore, South Korea, and Taiwan.

2 This estimate is based on purchasing power parity measures of GDP.

3 The Asian region here refers to Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, the Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam. The economic growth calculation weights these economies by GDP at market exchange rates.

4 These growth rates are measured on a quarter-to-quarter basis at an annual rate. China’s quarterly growth rate is estimated from published four-quarter growth rates.

5 The nominal data are the sum of the total merchandise exports of 44 economies, including the United States, expressed in U.S. dollars. The real data are calculated by deflating these dollar-value nominal exports by export price indexes constructed from local-currency deflators drawn from country sources and dollar exchange rates.

6 Specifically, the vertical axis shows each country’s deviation of average GDP growth from trend growth (at an annual rate) over 2008:Q4 and 2009:Q1. Trend growth is defined as the average annualized growth rate during 2006 and 2007 of historical GDP data smoothed using the Hodrick-Prescott filter. The horizontal axis shows each country’s trade openness as measured by the sum of its imports and exports as a fraction of its nominal GDP in 2007.

7 A country’s international assets are claims on foreigners by its residents, and liabilities are foreigners’ claims on the country’s residents. Data on these claims are from Haver and the U.S. Bureau of Economic Analysis.

8 Whether the relationship shown in Exhibit 3 is causal is not entirely clear, however, as economies that are more exposed to the global financial system also tend to be those economies most open to trade, as can be seen by comparing Exhibit 3 to Exhibit 2.

9 The data are quarterly through the second quarter of 2009. Exports are measured in U.S. dollars.

10 In principle, some rebuilding of inventories for export could also be boosting production, but such inventory data for the region that are available do not strongly support this view.

GENERAL DISCUSSION

Asia and the Global Financial Crisis

Chair: Rakesh Mohan

Mr. Hale: You outlined very clearly what the medium-term goals have to be in terms of current imbalances, which are higher savings here and more consumption in East Asia. I guess the next question is, how do we go about achieving that? These have been goals we've talked about now for several years, even before the crisis, and it looks like we have an intractable deficit problem here in the U.S. at the federal level. And China has taken a lot of dramatic steps over the last two years on every front, including health care, pensions, and education spending. But the household saving rate still remains very, very high.

The second question is on the immediate challenge in the next year of financial stability. Large numbers of emerging market fund managers now believe we're heading for an asset bubble in East Asia. The combination of a weak U.S. dollar, potential exchange rate appreciation in East Asia, and central banks avoiding exchange rate appreciation is going to encourage big gains in foreign exchange reserves, \$500 billion already since March, and this will nurture money growth and asset inflation. Is there any way the G-20 countries could address this issue through some new form of policy coordination, maybe encouraging the Asian countries to allow more exchange rate appreciation, for example?

Mr. Bernanke: Thank you. Well, you're right that there's a lot more talk than action about the current account imbalances in the period prior to the crisis. We had the IMF doing some consultations, but domestic policies were only modestly changed in response to that. Now, of course, we've had this terrible crisis. Clearly global imbalances have played some role in this crisis, and we've also had some important changes in global governance. You know, I used to attend one G-20 meeting a year, and now I seem to be attending them every other week. We have, I think, very appropriately and importantly, expanded the community of nations which are looking at these issues to include all the major emerging market nations or the biggest ones in the G-20, which, as you know, has been elevated to the leaders' level, as well as to finance ministers in central

banks. And the G-20 communique from the most recent meeting was very clear, and it was signed on to by China and Asian countries as well as by the industrial countries, about the importance of restoring balance and sustainable growth in the global economy. So, I think there is certainly more urgency now than there was, and there's more legitimacy to the governance process that should bring about greater balance.

I think, in the case of the United States, you're right, we have a difficult fiscal situation. But I think our policymakers recognize that we need to develop a fiscal exit strategy which will involve a trajectory towards sustainability. As I described in my remarks, that's critically important in order to maintain confidence in our economy, confidence in our currency, and so on. I know that's very well understood in Washington. By the same token, I believe that the Chinese, and the other Asian countries to a greater extent, are looking more seriously at rebalancing. The five-year plan in China, which now incorporates more social developments and more domestic spending, does appear to be having some effect, although it's very early and, of course, it is difficult to make such large changes. But I do think that we need both sides to participate in this rebalancing process. Now that we have a governance process which is supporting it and is directing the IMF and other international agencies to support that process, I think we have a better chance of getting there. In any case, I believe it's extraordinarily urgent, and I think most people would agree with me.

On asset price bubbles, I understand that's a concern. The Asians have been concerned about it. One way to address it would be through greater exchange rate flexibility, coupled perhaps with offsetting movements in fiscal policy. But clearly it's an issue that the Asians are going to have to pay close attention to as they look at all the different objectives they're trying to reach with their various policy instruments.

Mr. Mohan: Do you have a question?

Mr. Dooley: I think before we put a huge effort into eliminating imbalances, it would be useful to know, and we'll discuss this for the next two days presumably, what the connection was between the imbalances and the crisis we just had. You said they're clearly related, but, at least in my mind, there's no clear mechanism that we can point to and say, ah, there is a link between international imbalances and the crisis we've had. The other link is between insufficient regulation and the crisis. Since we have limited resources for reform, it seems to me we need to establish which of those links is more important before we go too far down the road of reform.

Mr. Bernanke: Well, it's certainly true the relationship between global imbalances and the crisis is a complex one, and I know that the Obstfeld and Rogoff paper later this morning is going to look at some of the complexities in that relationship. But I think we could hardly fail to be struck by what, in retrospect, is the parallel between the global financial crisis we're seeing now and the emerging market crises we saw in the '90s and many other periods. What those crises constituted were large capital inflows into a country and a financial system that, either because of immaturity in the financial structure itself or because of inadequate transparency in regulation, proved unable to manage adequately those inflows. And so, whatever complex story we end up telling about this crisis, clearly part of it was the fact that a lot of capital flowed into the industrial countries. The United States, of course, had a current account deficit of about 6 percent of GDP, corresponding to large capital inflows, which would not be a problem if we had invested and managed that money appropriately. But evidently we were not able to do that. Our financial regulatory system, financial private sector, and risk management mechanisms were overwhelmed and did not do a good job. As a result, there's a close interaction, I think, between capital inflows and the financial regulatory system. So, personally, I think you're going to have to address both of them, conceding that there are many complex interactions going on. But, to me, I think, there's a clear parallel to literally dozens of crises that we've seen previously. We were too smug. We saw this happening in emerging markets. We said it wouldn't happen in the United States, but a very similar pattern existed here as existed in other countries.

Mr. Mohan: Last question, Barry?

Mr. Eichengreen: After the Asia crisis, many countries concluded that they need more reserves, that they need more insurance in one form or another from shocks. And that creates a tension with the desire we all feel for global rebalancing. So the question is, do you see other mechanisms through which they could obtain the insurance they need?

Mr. Bernanke: Well, the motivations for accumulating foreign reserves are complex. In some cases, you have countries that have reserves that exceed all of their external debt, and so it's not clear that the reserves are simply there to address potential financial crises. They're also there as the byproduct of various policies relating to global imbalances in trade. So, I think that if we address the issues relating to global imbalances, to some extent problems with reserves will be addressed as well. Now, your question is alluding to alternative insurance

mechanisms, and many people have talked about various ways of getting away from self insurance to mutual insurance or other kinds of systems. I know that over the next decades there will be a lot of talk about ways of economizing on reserves. But again, I think that in the near term, the best way to address the issue of reserves is to address the fundamental cause, which is the imbalances generating those reserve accumulations. Thank you.

Mr. Mohan: Thank you very much.

The Impact of the Financial Crisis on Emerging Asia

Morris Goldstein and Daniel Xie

1. Introduction

Three assumptions helped to guide initial thinking about the impact of the U.S.—now global—credit crisis. Each of those assumptions has had to be revised substantially.

The first one was that the crisis could be contained at relatively low cost within the United States. Yet the July 2009 update to the International Monetary Fund's *Global Financial Stability Report* (IMF 2009b) put global credit losses on U.S. loans and securities at \$2.9 trillion; projected credit losses on loans and securities originated in Europe and Japan bring the global tally to over \$4 trillion—a far cry from the early estimates of \$50 to \$100 billion of credit losses in the U.S. subprime market.¹ Support for the financial system coming from governments and central banks in the United States, the euro zone, and the United Kingdom totals nearly \$9 trillion (composed of \$1.95 trillion in liquidity support, \$2.52 trillion for asset purchases, and \$4.48 trillion in government guarantees).² The U.S. fiscal deficit for both 2009 and 2010 is expected to exceed 11 percent of GDP, and the ratio of U.S. gross government debt to GDP is projected to rise from 62 percent in 2006 to 97 percent by 2010.³ In April 2008, the IMF's *World Economic Outlook* (WEO) forecast 2009 U.S. economic growth at 0.6 percent; the July [2009] update is -2.6 percent, following real GDP declines of roughly 6 percent in both the fourth quarter of 2008 and the first quarter of 2009. The unemployment rate is up from 4.9 percent pre-crisis to 9.7 percent. In terms of duration and cumulative output loss, this recession is our worst since the Great Depression.

Authors' note: We are grateful to Bill Cline, C. Fred Bergsten, Joe Gagnon, Yusuke Horiguchi, Nick Lardy, Jong-Wha Lee, Mike Mussa, Marcus Noland, Ted Truman, Philip Turner, and Steve Weisman for helpful comments and suggestions on an earlier draft. We are likewise indebted to Jon Anderson, Stephan Danninger, Kristin Forbes, and Brad Setser for making available to us some of the charts and data used in Sections 2 and 3 of this paper.

Reflecting large declines in U.S. equity and housing prices, the household saving rate has risen from nearly zero in 2007 to about 5 percent and could rise to 7 to 8 percent.⁴

A second assumption, that emerging markets would be able to “decouple” from a U.S. downturn, crumbled after the collapse of Lehman Brothers in September 2008. The IMF’s projection of 2009 growth in the emerging and developing countries went from 6.6 percent in April 2008 to just 1.5 percent in July [2009]. In October 2008, the emerging market bond spread hit 850 points—almost six times its pre-crisis level in June 2007. Industrial production and exports in emerging economies have plummeted. Even after a rise of 42 percent in 2009, the cumulative decline in a popular index of emerging market equities (MSCI.EM) is similar (26 percent) to the decline in the Standard & Poor’s 500 index for U.S. equities (29 percent). The Institute for International Finance (IIF 2009) projects a further decline in net private capital flows to emerging economies in 2009 to one-fifth of their 2007 level.

Yet a third flawed assumption was that emerging Asia would be protected by its low exposure to U.S. subprime loans and securities, ample international reserves, current account surpluses, low dependence on commodity exports, high share of interregional trade, improved banking systems, and ability to implement countercyclical macroeconomic policies. This expectation dissolved as real GDP fell between September 2008 and March 2009 by an average annualized rate of 13 percent in Hong Kong, Malaysia, Korea, Singapore, Taiwan, and Thailand. The IMF (in the April 2009 WEO) downgraded its 2009 forecast for (wider) developing Asia to 4.8 percent (versus a forecast of 8.4 percent in the April 2008 WEO). Economic growth in China dropped from a peak of nearly 14 percent in the second quarter of 2007 to 6.8 percent in the fourth quarter of 2008. India’s growth sank from over 10 percent at the end of 2006 to less than 5½ percent in the final quarter of 2008. According to the (August 2009) Blue Chip Consensus forecast, Hong Kong, Malaysia, Singapore, Korea, and Taiwan are still expected to suffer outright recessions in 2009. Emerging Asia’s exports fell at an annualized rate of 70 percent between September 2008 and February 2009. In June 2009, China’s exports were still 21 percent below their level of a year earlier. Between year-end 2007 and October 2008, the MSCI emerging market index for Asia fell by 50 percent—versus 34 percent for the United States. Near the end of October 2008, Korea and Singapore entered into \$30 billion swap arrangements with the U.S. Federal Reserve.

The last six months have brought their own “news,” as financial conditions stabilized in the United States and other advanced economies and as economic performance improved sharply in emerging Asia, prompting *The*

Economist to proclaim the advent of “Asia’s Astonishing Rebound.” Cries of “decoupling” are being revived along with an accent on Asia’s superior economic “fundamentals.” China’s economic growth accelerated to 7.8 percent in the second quarter (2009) and its (consensus) growth forecast for 2009 as a whole has been raised on the order of 100 to 200 basis points.⁵ So, too, with India. As highlighted by the *The Economist* (2009), on a sequential and annualized basis, second quarter (2009) growth increased by 21 percent in Singapore, by 10 percent in Korea, and by 5 percent in Indonesia. Goldman Sachs (2009) now sees real GDP growth in emerging Asia reaching 5½ percent in 2009. Asia’s export decline is slowing, with most of the region’s exports having bottomed out in February [2009]. The region’s sovereign bond spread (over U.S. Treasuries) has declined from 815 basis points in October 2008 to less than 300 basis points in late August 2009. Stock markets have turned around, with China’s stock market up 58 percent since January and the MSCI non-Japan Asian equity index up 25 percent since the beginning of 2009.

The purpose of this paper is to document more fully how the global financial crisis has affected emerging Asia and to identify some of the key characteristics that have made these economies more or less vulnerable to a transmission of crises from the advanced economies.

In Section 2 we offer a thumbnail sketch of how key economic variables in emerging Asia have evolved since the crisis began in the summer of 2007, and we review several studies of the effect of financial stress or growth slowdown in advanced economies on emerging Asian economies. Section 3 discusses how emerging Asia is different from other emerging economy regions in ways that matter for the contagion of crises, the emphasis here is on currency and maturity mismatches, the nature of the region’s foreign trade links (product composition, the geographic pattern of trade, and the degree of net export-led growth), financial market integration with the advanced economies, and the scope for implementing countercyclical monetary and fiscal stimulus. Finally, Section 4 offers concluding thoughts.

We focus mainly on China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand.⁶ Japan is excluded because of its size and advanced status. In the charts and tables in Section 2, we often employ (weighted) aggregate figures for “emerging Asia,” or “developing Asia”—constructed by either the international financial institutions (IFIs) or large financial firms. Because the Chinese economy is so large relative to the other economies in our group, there is a danger that weighted averages may not reveal much about those other economies.⁷ Consequently, we present both individual economy results as well as results for an unweighted average of Asian economies.

To clarify how emerging Asia is different, we often present calculations for a group of 12 other emerging markets, or OEMs—namely, Hungary, Poland, Russia, Turkey, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, and South Africa.

2. Impact of the Global Financial Crisis on Asian Economies: Some Mood Music

2.1. Before the Crisis to Now: Behavior of Some Key Economic Variables

As useful background, we summarize recent developments in economic growth, inflation rates, foreign trade, equity prices, sovereign bond spreads, exchange rates, international reserves, interest rates, credit flows, net capital inflows, financial stress, crisis severity, and headline public support for the financial sector.

2.1.1. Slowdown in Economic Growth

Tables 1 and 2 show the decline in economic growth during this crisis for country groups and for individual economies, respectively. We calculate the growth decline as the absolute value of the difference in real GDP growth rates between 2007 and (estimated) 2009, where the IMF's July 2009 forecasts are employed for estimated 2009 growth.⁸

TABLE 1
Economic Growth Slowdown, 2007–2009, by Country Groups

Country Group Name	2007	2008	2009f (July)	2007–2009f, change
Developing Asia ^a	10.6	7.7	5.5	-5.1
ASEAN-5 ^b	6.3	4.9	-0.3	-6.6
Newly industrialized Asian economies ^c	5.7	1.6	-5.2	-10.9
Central and Eastern Europe	5.4	2.9	-5.0	-10.4
CIS and Mongolia	8.6	5.5	-5.8	-14.4
Middle East	6.3	5.9	2.0	-4.3
Western Hemisphere	5.7	4.2	-2.6	-8.3
Memo:				
World	5.2	3.2	-1.4	-6.6
Advanced economies	2.7	0.9	-3.8	-6.5
Emerging and developing economies	8.3	6.1	1.5	-6.8

^a Developing Asia: Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Kiribati, Laos, Maldives, Myanmar, Nepal, Pakistan, Papua New Guinea, the Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu, and Vietnam.

^b ASEAN-5: Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

^c Newly industrialized Asian economies (NIEs): Hong Kong, Korea, Singapore, and Taiwan Province of China.

TABLE 2
Economic Growth Slowdown, 2007–2009, by Individual Economy

Area	Economy	2007	2008	2009f	2009f–2007	1998–1996
Asia	Singapore	7.8	1.1	–10.0	–17.8	
CEE	Russia	8.1	5.6	–6.0	–14.1	
Asia	Hong Kong	6.4	2.5	–4.5	–10.8	
LatAm	Venezuela	8.4	4.8	–2.2	–10.6	
LatAm	Argentina	8.7	7.0	–1.5	–10.2	
Asia	Malaysia	6.3	4.6	–3.5	–9.8	–17.4
CEE	Turkey	4.7	1.1	–5.1	–9.8	
Asia	Korea	5.1	2.2	–4.0	–9.1	–13.9
Asia	Thailand	4.9	2.6	–3.0	–7.9	–16.4
LatAm	Colombia	7.5	2.5	0.0	–7.5	
CEE	Poland	6.7	4.8	–0.7	–7.4	
Asia	Philippines	7.2	4.6	0.0	–7.2	–6.4
LatAm	Mexico	3.3	1.3	–3.7	–7.0	
LatAm	Brazil	5.7	5.1	–1.3	–7.0	
Asia	China	13.0	9.0	6.5	–6.5	
Africa	South Africa	5.1	3.1	–0.3	–5.4	
LatAm	Peru	8.9	9.8	3.5	–5.4	
Asia	India	9.3	7.3	4.5	–4.8	
LatAm	Chile	4.7	3.2	0.1	–4.6	
CEE	Hungary	1.1	0.6	–3.3	–4.4	
Asia	Indonesia	6.3	6.1	2.5	–3.8	–20.9
<i>Emerging Asia, average</i>		7.4	4.5	–1.3	–8.6	
<i>Non-Asian OEMs, average</i>		6.1	4.1	–1.7	–7.8	

Source: IMF WEO database and updates, 2009.

Notes: IMF WEO July 2009 forecast for 2009 GDP growth. CEE: Central and Eastern Europe; LatAm: Latin America.

Tables 1 and 2 indicate that (1) all country groups show large declines in economic growth during this crisis; (2) when one uses a broad Asian emerging market aggregate—like “developing Asia”—that includes China and India (along with 21 other Asian economies), then the growth slowdown in emerging Asia is considerably smaller than that in other emerging market regions (with the exception of the Middle East); (3) the decline in growth in the ASEAN-5 (that is, the Association of Southeast Asian Nations economies of Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) is comparable to that experienced for emerging and developing countries as a group, for advanced economies, and for the world as a whole; (4) the growth decline in the Asian newly industrialized economies (NIEs)—composed of Hong Kong, Korea, Singapore, and Taiwan—is considerably larger and comparable to the growth decline in the emerging economies of Central and Eastern Europe (though smaller than the growth decline in the Commonwealth of Independent States or CIS economies); (5) the five Asian emerging economies most affected during the Asian

financial crisis of 1997–98 (Indonesia, Korea, Malaysia, the Philippines, and Thailand), experienced growth declines about half as large as those during that earlier crisis;⁹ (6) turning to the individual country results in Table 2, Singapore had the largest growth decline within emerging Asia (followed by Hong Kong and Malaysia), whereas Indonesia, India, and China had the smallest declines; and (7) the (unweighted) average growth decline for the nine Asian emerging economies is similar (–8.6 percentage points) to that (–7.8 percentage points) for the group of twelve non-Asian OEMs.¹⁰

2.1.2. *Headline and Core Inflation Rates*

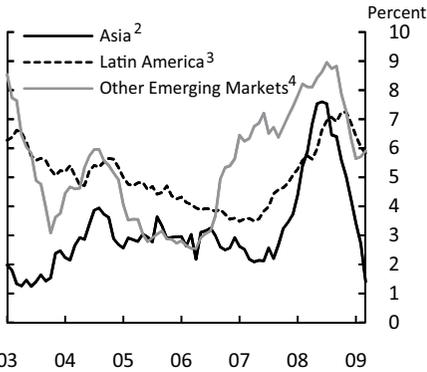
Panels A and B of Chart 1 display headline and core inflation rates for groups of emerging economies. While inflation rates in emerging Asia display a pattern during this crisis similar to those of other emerging markets—that is, rising from mid-2007 to early or mid-2008 and then falling—it is noteworthy that Asian inflation rates declined faster and farther than their emerging market counterparts; as in the pre-crisis period, inflation rates in emerging Asia are lower than in other emerging market regions.¹¹

2.1.3. *Contraction of Foreign Trade, the Terms of Trade, and Current Account Imbalances*

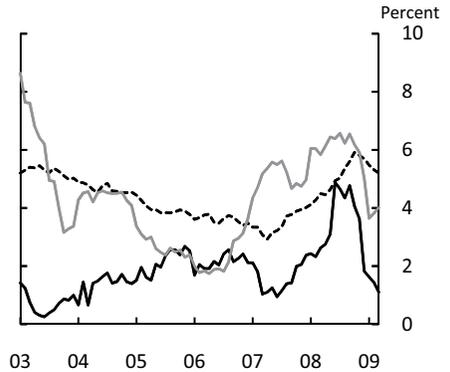
Panels C, D, and E of Chart 1 outline the volatile behavior of foreign trade during this crisis and highlight the collapse of foreign trade in the fourth quarter of 2008—linked to the sharp downturn in economic activity in advanced countries and exacerbated by lower availability of trade credit. There is a very strong similarity in the time pattern of exports across the different emerging market groups. This similarity is also confirmed by more detailed calculations. The peak-to-trough decline in exports for the nine Asian emerging economies was 47 percent (on an unweighted basis) versus 52 percent for the twelve OEMs; the rise in exports from the trough to the present was also similar (30 percent for Asian economies versus 22 percent for the OEMs). Within Asia, the economies that showed the most pronounced export contractions and expansions during this crisis were China, Korea, Hong Kong, and Taiwan. Panel D indicates that imports, too, tumbled across all emerging market regions beginning in the fourth quarter of 2008; indeed, in emerging Asia, the decline in imports has been larger than the export decline—contributing to a small further rise in emerging Asia’s trade balance (see panel E). Developing Asia has recorded a small improvement (2.1 percent) in its terms of trade over the 2007–09 period—not as favorable as the 6.5 percent improvement recorded by emerging economies in Central and Eastern Europe, but much better than the large declines

CHART 1
Emerging Markets' Economic Indicators

A Headline Inflation¹



B Core Inflation⁵



¹ Annual change in consumer prices, in percent; median of the economies listed. ² China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand; for India, wholesale prices. ³ Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. ⁴ The Czech Republic, Hungary, Poland, Russia, South Africa, and Turkey. ⁵ CPI excluding food and energy.

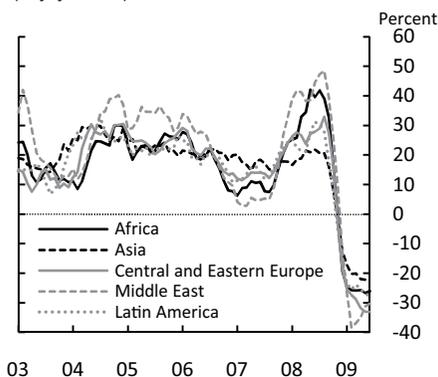
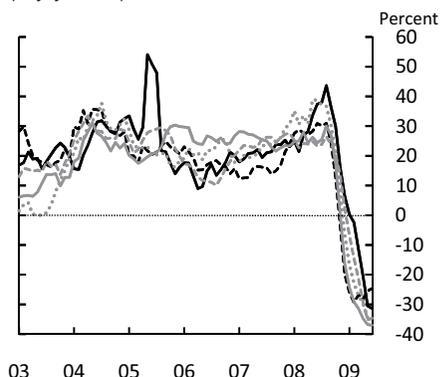
Source: BIS (2009).

experienced by emerging economies in Latin America (−6.7 percent), in the CIS (−10.2 percent), in Africa (−11.8 percent), and in the Middle East (−17.9 percent). The latest IMF forecast (July WEO, 2009a) sees little change in the current account surplus for developing Asia during the crisis—it falls from 6.9 percent of GDP in 2007 to an estimated 6.4 percent in 2009. We, however, expect emerging Asia's current account surplus to be considerably lower in 2009 if China's current account surplus in 2009 comes in at, say, 5 to 6 percent of GDP rather than the 10 percent of GDP surplus projected in April 2009.¹² Emerging Asia is likely to be the emerging market region with the largest current account surplus (relative to GDP) in 2009.¹³ Within emerging Asia, only India and Indonesia are projected to run current account deficits in 2009.¹⁴ In contrast, nine of the twelve OEMs are expected to face current account deficits this year.

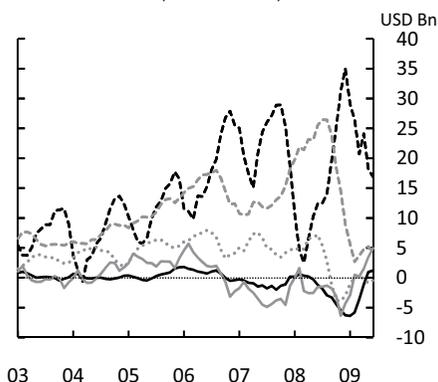
2.1.4. Equity Prices

Panel F of Chart 1 shows equity price movements during the crisis. As with the trade figures, the commonality across emerging markets is readily apparent. The index for emerging Asia peaks in the summer of 2007 and then falls sharply until turning up in early 2009. Using the regional MSCI indices, we calculate that the peak-to-trough declines in equity prices were quite similar among

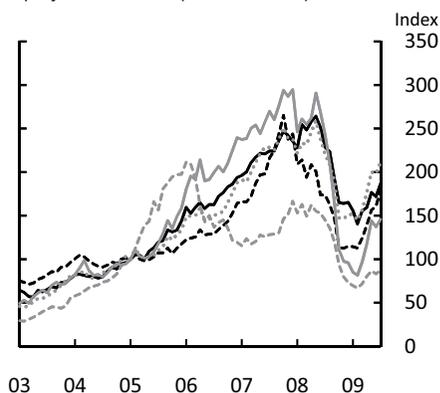
CHART 1 (CONTINUED)

C Export growth by regionExport growth, currency-adjusted terms
(% y/y 3mma)**D Import growth by region**Import growth, currency-adjusted terms
(% y/y 3mma)**E Trade balance by region**

Net trade balance (US\$bil 3mma)

**F Equity markets by region**

Equity market index (Jan 2003=100)



Source: Anderson (2009), UBS.

emerging Asia, emerging Europe, and Latin America (61, 71, and 57 percent, respectively). Over the crisis period as a whole (July 2007 to August 2009), however, substantial differences appear; the decline for the emerging Asia index (-17 percent) was considerably smaller than that for emerging Europe (-42 percent) but larger than that for Latin America (-7 percent).¹⁵ Within emerging Asia, the largest stock market declines (over the crisis period as a whole) have occurred in Singapore (-27 percent), Thailand (-21 percent), and the Philippines (-21 percent), whereas India has had the best performance (with the index practically flat). The three emerging economies with the largest stock market

declines (greater than 40 percent) during the July 2007 to August 2009 period—Russia, Hungary, and Poland—are all from Central and Eastern Europe.

2.1.5. Sovereign Bond Spreads

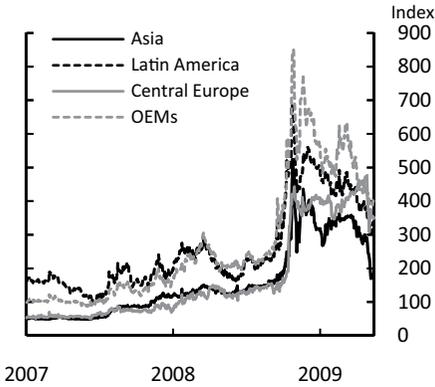
Interest rate spreads also move in tandem—showing a spike in the final quarter of 2008, and then a bumpy but significant decline since then; see panel G of Chart 1. That said, emerging Asia had both a smaller percentage run-up in sovereign spreads than either Latin America or emerging Europe between the beginning of the crisis (July 2007) and the peak point of risk aversion (October 2008), as well as a more rapid percentage decline since then; consequently, for July 2007 to August 2009, emerging Asia’s percentage increase in spreads was smaller than elsewhere. Within emerging Asia, the economy experiencing the largest increase in spreads was Indonesia, with an Emerging Markets Bond Index Plus (EMBI+) spread jump from 168 basis points in July 2007 to more than 920 basis points in December 2008. On the other side of the ledger, China saw a spread increase of roughly 270 basis points from the start of the crisis to October 2008.

2.1.6. Exchange Rates

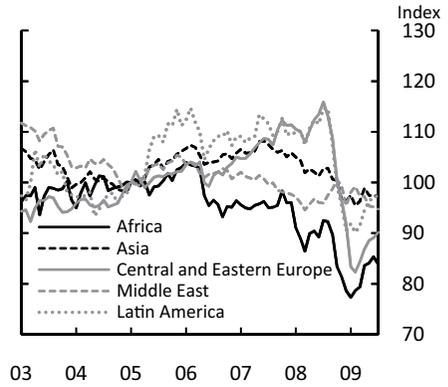
As emphasized by Ito (2007), during the height of the Asian financial crisis, the currencies of all emerging market economies in East Asia (except mainland China and Hong Kong SAR) suffered extremely large declines against the U.S. dollar. This time, the decline in the currencies of emerging Asia was more moderate, particularly with respect to the U.S. dollar.¹⁶ As shown in panel H, which shows movements in nominal effective exchange rates for five emerging market groups, currencies in emerging Asia were much less volatile during this crisis than the currencies of emerging economies in either Latin America or Central and Eastern Europe; the latter regions had more appreciation prior to the October 2008 collapse and much more depreciation after it. Hidden under this generalization, however, were some notable differences in currency behavior within Asia.

Table 3 shows that, among the 21 emerging economies, Korea’s currency experienced the largest fall (26 percent) in its real effective exchange rate between July 2007 and June 2009; the currencies of India and the Philippines have also been subject to nontrivial depreciations in their real effective exchange rates. In contrast, the Indonesian rupiah, the Malaysian ringgit, and the Chinese renminbi have all appreciated their real effective rates. Table 3 also indicates that movements in real effective rates can be quite distinct from movements in bilateral exchange rates and that unweighted regional averages

CHART 1 (CONTINUED)

G Sovereign spreads, international⁶**H Exchange rates by region**

EM NEER currency index (Jan 2005=100)



6 JPMorgan EMBI Global (EMBIG) sovereign spreads over U.S. Treasury yields (for Korea and Thailand, CMA five-year credit default swap premia), in basis points. Chinese Taipei, the Czech Republic, India, and Singapore are excluded from the regional aggregates.

Source: Anderson (2009), UBS.

can produce quite different results than weighted indices. In the former connection, the Russian ruble has been subject to a sizeable depreciation vis-à-vis the U.S. dollar during this crisis but (presumably because of even larger currency depreciations among some of its CIS neighbors), its real effective rate has actually appreciated on net since the crisis started. On average, the nine Asian economies showed a slightly larger depreciation of their real effective exchange rates during the whole crisis period than did the average of the currencies of the twelve OEMs.

2.1.7. International Reserves

Table 4 summarizes the evolution of international reserves (measured in billions of special drawing rights or SDRs) during this crisis. With the exception of African economies, developing Asia had the largest percentage increase in reserves among all the emerging market (EM) regions; only the CIS group showed a decline in reserves. Across our sample of 21 emerging economies, Korea showed the largest decline in reserves during the crisis, followed by Malaysia. All the remaining economies in emerging Asia showed reserve increases, with particularly large percentage increases recorded by Thailand, China, the Philippines, and Hong Kong. According to standard measures of reserve adequacy (with the exception of ratio of reserves to M2), emerging Asia has the most ample holdings of international reserves; in 2009, emerging Asia had a ratio of reserves

TABLE 3
Exchange Rate Movements, Emerging Economies, 2007–2009

Area	Economy	Jul 07–Jun 09 % change vis-à-vis USD	JPMorgan REER Jun 97–Jul 98 % change	Jul 07–Jun 09 % change vis-à-vis USD	JPMorgan REER Jun 97–Jul 98 % change
Asia	Korea	-28.6	-25.7	-27.8	-13.2
LatAm	Mexico	-16.7	-14.3		
CEE	Turkey	-16.3	-11.7		
Asia	India	-15.6	-11.1		
CEE	Poland	-12.6	-10.9		
Asia	Philippines	-5.6	-8.0	-37.2	-25.2
LatAm	Argentina	-18.0	-5.2		
Asia	Singapore	4.1	-3.0		
CEE	Hungary	-6.0	-1.6		
Asia	Thailand	-0.6	-1.4	-36.8	-15.7
Asia	Hong Kong	0.9	-1.0		
LatAm	Colombia	-9.9	-1.0		
CEE	Russia	-18.2	3.2		
LatAm	Chile	-1.1	4.1		
LatAm	Peru	5.0	5.1		
Africa	South Africa	-7.8	5.6		
Asia	China	10.8	6.5		
LatAm	Brazil	-3.6	7.0		
Asia	Malaysia	-2.0	10.6	-39.1	-24.5
Asia	Indonesia	-9.9	18.7	-81.2	-64.4
LatAm	Venezuela	0.0	54.5		
	<i>Emerging Asia, avg.</i>	-5.2	-1.6		
	<i>Non-Asian OEMs, avg.</i>	-8.8	2.9		

Sources: IMF; JP Morgan.

Notes: A negative (positive) sign denotes depreciation (appreciation) of the local currency. REER = real effective exchange rate.

to short-term external debt that was roughly twice as high as in Latin America and six times as high as in Central and Eastern Europe.¹⁷ As shown in Table 4, that asymmetry across EM regions was also visible in the pre-crisis period (that is, in 2006–07).

2.1.8. Interest Rates

Another painful memory for those economies hardest hit in the Asian financial crisis was the decision to raise interest rates sky-high during a contraction in order to support the local currency and to discourage capital outflows. In Indonesia, for example, the discount rate hit 70 percent in July 1998 and policy interest rates also hit double digits in 1998 in Thailand and the Philippines (and almost that in Malaysia). We discuss monetary policy stimulus in Section 3, but for now it is sufficient to note that the rise in policy interest rates was more

TABLE 4
International Reserves, Emerging Economies, 2006–2009

International reserves (in billions SDR)					Reserves/M2 (%)			Short-term external debt as % of reserves		
Area	Economy	2007 M7	2009 M3	2007M7–2009M3 % change	Economy	2006	2007	Economy	2006	2007
<i>Developing Asia</i>		1254	1577	25.8	<i>Emerging Asia, avg.</i>	32.6	35.0	<i>Emerging Asia, avg.</i>	28.8	30.3
<i>Central and Eastern Europe (CEE)</i>		177	195	10.1	<i>Non-Asian OEMs, avg.</i>	40.0	40.5	<i>Non-Asian OEMs, avg.</i>	43.5	41.7
<i>Western Hemisphere</i>		261	314	20.2						
<i>Africa</i>		167	212	26.8						
<i>Middle East</i>		172	210	22.5						
<i>Advanced economies</i>		1566	1673	6.9						
<i>CIS and Mongolia</i>		306	285	-7.0						
Asia	Korea	166	138	-17.1	South Africa	14	14.5	Poland	71.3	91.8
Asia	Malaysia	64.1	58.5	-8.8	Mexico	16.8	17.6	Argentina	105	82.5
CEE	Russia	267	247	-7.4	Chile	27	17.9	Chile	48.5	79
CEE	Turkey	45.9	45.2	-1.5	Korea	19.3	19.3	Indonesia	77.5	61.4
LatAm	Venezuela	12.1	12.1	0.3	Hong Kong	20.5	19.5	Korea		61.1
LatAm	Argentina	28.1	30.1	7	Turkey	28.9	25	Turkey	66.9	54.6
Asia	Indonesia	32.9	35.3	7.2	China	24.2	27.7	South Africa	59.6	50.3
CEE	Poland	35.3	39	10.6	Poland	28.2	28	Venezuela	32.3	34.7
LatAm	Mexico	51.1	57.2	12	Colombia	27.9	28.7	Colombia	31.2	25.5
Asia	India	144	162	12.6	India	26.2	29.8	Thailand	26.6	24.7
Asia	Singapore	96	111	15.8	Indonesia	26.9	31.5	Brazil	23.7	21.8
Africa	South Africa	17.5	20.5	16.7	Thailand	27.5	31.6	Philippines	21.8	21
LatAm	Colombia	13.1	15.6	18.9	Hungary	34.6	31.9	Peru	17.3	20.9
LatAm	Brazil	101	127	25	Venezuela	53.6	34.4	Russian	13.3	16.6
LatAm	Chile	12.1	15.6	28.7	Philippines	29.1	34.9	India	14.8	15.8
LatAm	Peru	14.9	20.1	34.7	Brazil	27.6	40.7	Malaysia	16	15
Asia	Hong Kong	89.5	125	39.2	Malaysia	40.4	42	China	16	13.2
Asia	Philippines	16.5	23.2	41	Peru	63.6	77.6	Hungary		12.2
Asia	China	907	1311	44.6	Singapore	79.7	79	Mexico	9.6	10.3
Asia	Thailand	47.3	76.2	61.2	Argentina	70.7	83.3			
CEE	Hungary	14.8	24.7	66.5	Russia	86.7	86.5			

Sources: IMF International Financial Statistics; World Bank World Development Indicators; Global Developing Finance.

limited in emerging markets during this crisis: it took place mainly in 2008 (in response to inflationary pressures and capital outflows), and the trend has been downward in 2009. All nine Asian emerging economies had lower short-term interest rates in 2009 than in 2007, with India and Korea having experienced the largest reductions and Indonesia and the Philippines the least. Those emerging economies that experienced a net increase in short-term interest rates as between 2007 and 2009 are all from other EM regions—mostly Latin

America or Central and Eastern Europe. On average, the nine Asian emerging economies saw a net reduction of 220 basis points in short-term interest rates over the 2007–09 period versus only 25 basis points for the twelve OEMs.

2.1.9. Credit Flows

Yet another worry during financial crises is that credit growth—including bank lending—to the private sector will dry up, adversely affecting real economic activity. Panels I and J of Chart 1 indicate that neither bank lending growth nor private credit growth has shown much of a decline in emerging Asia during this crisis. As widely reported, bank lending growth in China has surged at an annual rate of over 25 percent in 2009. Most noteworthy, emerging Asia is the only EM group where private credit growth and bank lending growth have not turned down sharply since the crisis began. One reason is that banking systems in most Asian economies had benefited from a strong rise in bank deposits in the run-up to the crisis; hence, their balance sheets were very liquid and (with the notable exception of Korea) they were not highly dependent on international wholesale funding.¹⁸

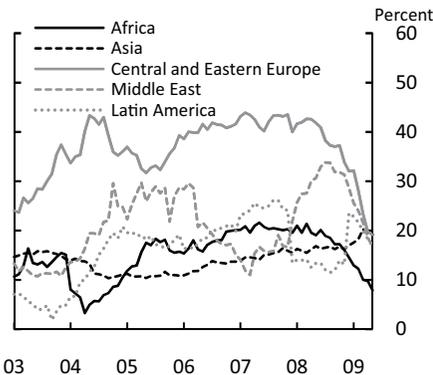
2.1.10. Net Private Capital Inflows

In previous financial crises in emerging markets a “sudden stop” in net private capital inflows has sharply reduced economic growth and investment, particularly in economies with a high share of foreign-currency-denominated debt and limited export openness.¹⁹ Net private capital inflows are forecast (by the IMF

CHART 1 (CONTINUED)

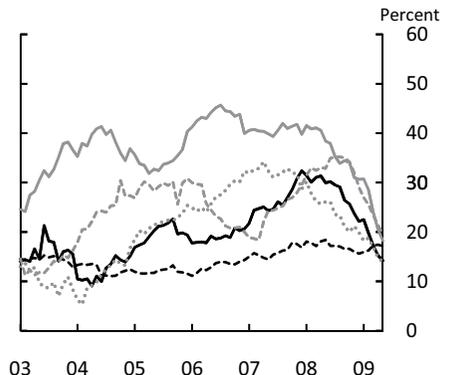
I Bank lending growth by region

Bank lending growth (% y/y)



J Private credit growth by region

Private sector credit growth (% y/y)



Source: Anderson (2009), UBS.

2009e) to be negative in all EM regions in 2009 except for Latin America. By far the largest percentage reduction in net inflows (as a share of GDP) in 2009 (relative to the average of 2005–07) is expected to occur in emerging Europe, followed (in order) by emerging Asia and Latin America; the only EM region expected to avoid a sudden stop is the Middle East. If it is realized, the forecast percentage drop in net private capital flows into emerging Asia during this crisis would be slightly larger than the sudden stop in the Asian financial crisis.²⁰

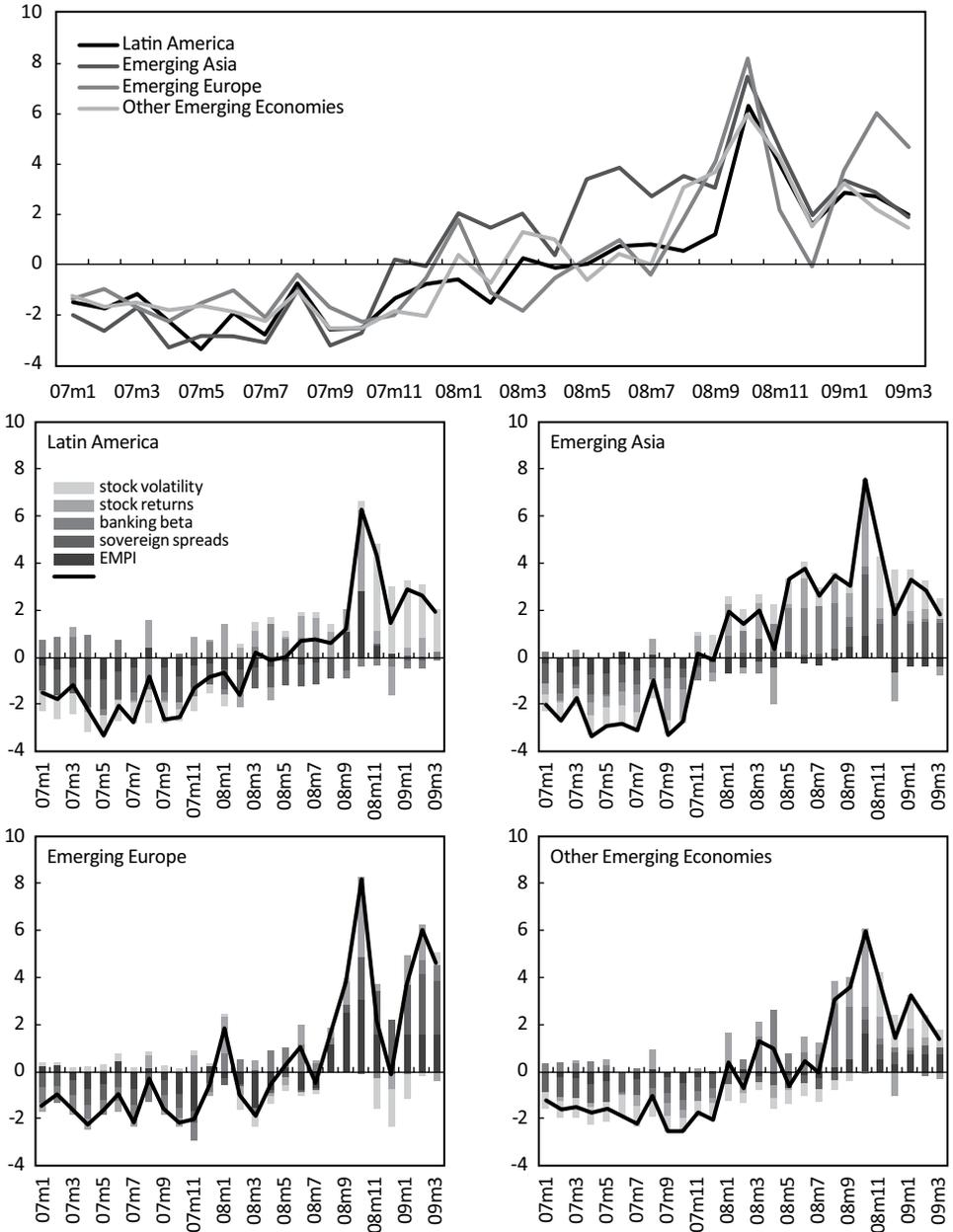
2.1.11. Financial Stress

“Financial stress” indices seek to combine equity, debt, and exchange market pressures into a single index. A praiseworthy effort to construct such a financial stress index (FSI) for emerging economies has recently been completed by Balakrishnan, Danninger, Elekdag, and Tytell (2009). Their FSI for emerging economies has five components: an exchange market pressure index, sovereign interest rate spreads, a “banking sector beta” (that measures the link between banking sector stocks and the overall stock market), a measure of stock price returns, and a time-varying measure of volatility in the stock market. The FSI is available for 18 emerging markets from 1998 to 2009 using monthly data; the “emerging Asia” group contains seven Asian economies (China, India, Indonesia, Korea, Malaysia, the Philippines, and Thailand—along with Pakistan and Sri Lanka). Chart 2 shows the behavior of the FSI regional indices over the 2007–09 (until March 2009) period, including the components of the index. Several features stand out. The period of maximum financial stress in all four EM groups is October 2008. The level of financial stress in emerging Asia in October 2008 is higher than that in any other EM region or group except for emerging Europe and (although not shown in Chart 2) is also as high as the level of stress at the height of the Asian financial crisis in 1998. All five components of financial stress are above average in emerging Asia in the fall of 2008 but the main contributions are made by very poor stock market returns and high sovereign spreads. In contrast, neither exchange market pressure nor high volatility in banking stocks are at exceptional levels at that time. Between November 2008 and March 2009, the level of stress in emerging Asia recedes gradually.

2.1.12. Alternative Indices of Crisis Severity

Just as some authors have proposed a comprehensive index of financial stress, some others have put forward more comprehensive indices of crisis severity. More specifically, Rose and Spiegel (2009) have suggested that the severity of this crisis should be measured (at the country level) by a combination of real GDP growth over 2008, the percentage change in the SDR exchange rate over

CHART 2
Financial Stress Index by Regions



Sources: Balakrishnan, Danninger, Elekdag, and Tytell (2009).

Note: Emerging Asia: China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, and Thailand. Emerging Europe: Czech Republic, Hungary, Poland, Romania, Slovak Republic, and Slovenia. Latin America: Argentina, Brazil, Chile, Colombia, Mexico, and Peru. Other emerging economies: Egypt, Israel, Morocco, Russia, South Africa, and Turkey.

2008, and the change in the country's credit rating as furnished by *Institutional Investor* or *Euromoney*. They then use factor analysis to extract the common component and show the results for the 40 most affected countries from their sample of 107 countries. To make a long story short, only one economy from emerging Asia ends up in the top ten, namely, Korea (ranked seventh) and only three are in the top 40, namely, in addition to Korea, Singapore (33) and Thailand (39). Iceland is the most affected, followed by Ukraine, Estonia, Argentina, Latvia, and Ireland. Among emerging market regions, the CIS economies are most affected, followed by emerging Europe. Emerging Asia is situated similarly (i.e., relatively little affected) to Latin America.

2.1.13. *Headline Financial Support to the Financial Sector and Borrowing from the IMF*

Another common feature of earlier financial crises has been very large fiscal costs of assistance to and restructuring of banking and financial systems. For example, Caprio et al. (2005) estimate that the fiscal costs of the 1997–2002 banking crises in emerging Asia ranged from 16 percent of GDP in Malaysia, to 28 percent in Korea, to 35 percent in Thailand, to 55 percent in Indonesia. The IMF (2009c) has recently estimated for G-20 economies the amount of headline support and up-front financing for the financial sector during this crisis. Korea tops the list for emerging economies, with headline support equal to 20 percent of GDP (although the up-front cost has been less than a half percent of GDP). Within emerging Asia, India is the only other economy with any significant headline support, estimated at close to 7 percent of GDP. No headline support has been necessary in the case of China and only very minor support in the case of Indonesia. Another sharp contrast with the Asian financial crisis is that this time none of our nine Asian economies has found it necessary to enter into a financial support program with the IMF.

2.2. Estimates of Spillover Effects on Emerging Asia

Suggestive though they are, before-to-now comparisons of economic outcomes do not provide an estimate of the “independent” effect of the financial crises cum growth slowdowns in the advanced economies on emerging Asia, nor do they measure the correlation between outcomes in emerging markets and those in the advanced economies.²¹ There are, however, some studies of such estimates. Following is a review of three of the most salient.²²

Balakrishnan, Danninger, Elekdag, and Tytell (2009, henceforth BDET) provide estimates of crisis transmission effects that are relevant for this paper's focus. They begin with indices of financial stress in both advanced and emerging

economies. We described the index for emerging economies (EMFSI) earlier. The index for advanced economies (AEFSI) is constructed from three banking related variables (the “beta” for banking sector stocks, the TED spread, and the slope of the yield curve), three securities market variables (corporate bond spreads, stock market returns, and time-varying volatility in stock returns), and one foreign exchange variable (time-varying volatility in the effective exchange rate). The regression equation for estimating crisis transmission effects is of the following form:

$$(1) \quad EMFSI_i = B1 + B2 \cdot AEF SI + B3 \cdot OEMFSI + B4 \cdot GF,$$

where *EMFSI* is financial stress in emerging economy *i*, *AEFSI* is financial stress in either an aggregate of 17 major advanced economies or in three separate advanced economy regions (namely, the United States and Canada, Western Europe, and Japan and Australia), *OEMFSI* is financial stress in other emerging economies, and *GF* are global control variables (namely, three-month London interbank offered rate or Libor, year-on-year changes in global industrial production, and commodity prices).²³ There are two episodes of high financial stress in advanced countries during the sample period: July 1998 to June 2003 (including the Long-Term Capital Management collapse, the dot-com crash, and the failures of WorldCom, Enron, etc.) and July 2007 to the present. Equation (1) is estimated for each of 18 emerging economies on data for the whole time period (January 1997 to January 2009), as well as for the two crisis subperiods. The model fits the data well. The key parameter of interest is *B2*, which measures crisis transmission from the advanced to emerging economies.²⁴ Its average value for the full sample is 0.7, it is statistically and economically significant, and the lags are very short (one to two months). Whereas in July 1998 to June 2003, the U.S. and Western Europe had roughly an equal effect on financial stress in the emerging economies, during this crisis, stress in Western Europe had a considerably larger effect than stress in the United States. Our primary interest is in the size of *B2* for Asian emerging economies. Five East Asian economies (China, Korea, Malaysia, the Philippines, and Thailand) are in BDET’s sample. For the sample period as a whole, the emerging Asian economies—taken as a group—rank in the middle of the pack, but there are notable differences among them; specifically, Korea is estimated to have the third (of 18) highest sensitivity to financial stress in advanced economies, behind Turkey and Chile; the ordinal ranking for the other Asian economies are the Philippines (9th), Malaysia (10th), Thailand (14th), and China (16th). BDET also provide separate estimates of *B2* for the current crisis. Interesting (and perplexing) enough, the ordinal rankings for this period differ considerably

from those for the sample period as a whole. In this crisis, China winds up with the second highest (among 16 EMs this time) *B2* coefficient (just behind Hungary), with Korea the sixth most affected; the Philippines, Malaysia, and Thailand are in the lower half of the distribution. The average rank for the Asian emerging economies as a group is again right in the middle.

Helbling et al. (2007) have studied the extent to which other countries can decouple from the U.S. economy—particularly during a U.S. downturn, drawing both on correlation analysis and model-based simulations. They find that the potential size of spillovers from the U.S. has increased with greater trade and financial integration, that such spillovers are largest for economies with close trade and financial linkages (particularly Latin America), and that such spillovers tend to be larger during recessions. Calculating simple correlations over the 1994–2006 period, they conclude that U.S. GDP growth is most highly correlated with GDP growth in Latin America and least correlated with growth in emerging Europe; the correlation with GDP growth in emerging Asia is in the middle. Emerging Asia has a higher correlation with U.S. stock market prices than other EM regions. Turning to regressions where output fluctuations in emerging economies are related to output fluctuations in the advanced economies and to a set of control variables, Helbling et al. (2007) report the following: growth declines in the United States have a much smaller effect on emerging Asia than on Latin America or the Caribbean; growth declines in the euro area have almost as large an effect on emerging Asia as do growth declines in the United States; and growth declines in Japan have a much smaller effect on growth in emerging Asia than do growth declines in either the United States or the euro area. In a more dynamic analysis using a vector autoregression framework, Helbling et al. (2007) again find that (negative) shocks to growth in the United States have a larger growth impact on Latin America than on the ASEAN-4 and NIEs and that the spillovers peak after one quarter. Finally, they find that within emerging Asia, the largest effects of a U.S. growth decline are felt by Hong Kong, Korea, Taiwan, and Malaysia; in contrast, spillover effects are smaller for India, the Philippines, Singapore, China, and Thailand.

Last but not least, Guimaraes-Filho et al. (2008) provide an intensive examination of spillovers from the United States to Asia—using a variety of approaches (trade and financial exposure, correlation analysis, regression analysis, model simulations, etc.). Among their major findings, (1) total export exposure of emerging Asia to the United States and the EU-15—including shipments of intermediate and capital exports used as inputs to goods assembled in third countries and then reexported to the U.S. and European Union (EU)

for final consumption—has gone up substantially and faster than direct exposure over the 1994–2006 period ; (2) total export exposure of emerging Asia to the U.S. in 2006 was roughly equal to its total exposure to the EU-15; (3) within emerging Asia, export exposure to the U.S. and EU-15 is highest by far for Singapore and Malaysia and lowest for India and Indonesia; (4) financial integration with the United States on both the asset and liabilities sides of emerging Asia’s balance sheet has increased sharply over this period; (5) emerging Asia’s holdings of U.S. portfolio securities is now much higher than U.S. holdings of Asian portfolio securities; (6) growth in emerging Asia is now much more highly correlated with the U.S. growth cycle than it was in the early 1990s—and so too with the correlation of equity prices; (7) growth spillovers from the United States to Asia are much larger than the spillovers from either the EU-15 or Japan, with the largest spillovers evident for the Asian economies that have the largest trade exposure to the United States; and (8) a 1 percent growth slowdown in the United States appears to generate approximately a 0.2 to 0.5 percent slowdown in emerging Asia as a whole, and a somewhat larger slowdown in emerging Asia excluding China and India.

To sum up, relative to other emerging market groups, the impact of the global financial crisis on emerging Asia has been mixed. Whereas the broader aggregates for emerging Asia that include China, India, and Indonesia show a relatively small growth slowdown during the crisis, the NIEs (Hong Kong, Korea, Singapore, and Taiwan) experienced very sharp growth slowdowns on a par with those in Central and Eastern Europe, though not as severe as in the CIS region. The volatility in, and time pattern of, emerging Asia’s exports, imports, sovereign bond spreads, equity prices, and financial stress indices are similar to those in most other emerging market regions, although the net change during the crisis has often been in emerging Asia’s favor—especially when compared to emerging Europe. In terms of international reserves, exchange rates, credit flows, market interest rates, and public sector support to the financial sector, emerging Asia looks, at least so far, to have been much less adversely affected than other EM regions or groups. Empirical estimates of the cross-country spillover effects of financial stress or growth slowdown in the advanced countries (holding other factors constant) generally find that emerging Asia is neither the most nor least affected EM region—whether during this crisis or over a longer time period. Growth spillover effects from the United States on emerging Asia have been growing. Within emerging Asia, Korea is the most sensitive to financial stress in the advanced economies, while the NIEs as a group appear most sensitive to a growth slowdown in the United States.²⁵

3. How Is Emerging Asia Different in Ways That Matter for Crisis Vulnerability?

Measuring the impact of the current global financial crisis on emerging Asian economies is one thing. Figuring out why the effects vary is quite another. In this section, we review arguments and evidence about the region's vulnerabilities. The emphasis here is on currency and maturity mismatches, foreign trade links, financial integration, and the scope for countercyclical monetary and fiscal policies.²⁶

3.1. Currency and Maturity Mismatches

Thinking back over past emerging market crises, including those in Mexico in 1994–95, Asia in 1997–98, Russia in 1998, Argentina in 2001–02, Brazil in 2001–02, Turkey in 2000–02, and the current crisis in Eastern Europe, one finds that practically all of them were made more costly by the presence of large currency and maturity mismatches. By a currency mismatch, we mean a situation where assets and liabilities are denominated in different currencies so that an entity's net worth or net income is sensitive to changes in the exchange rate (Goldstein and Turner 2004). When liabilities denominated in foreign currency are small and when the tradable goods sector is large (relative to the size of the economy), a depreciation of the local currency that's in a crisis poses less of a problem because it improves competitiveness and spurs net exports. In contrast, when foreign currency liabilities are sizeable and when export openness is low, negative balance sheet effects quickly transform currency depreciation into a net contractionary force; indeed, currency mismatches are probably the best explanation we have for why emerging market currency crises have frequently been linked with sizeable negative output effects. Maturity mismatches likewise count because entities that rely heavily on short-term funding sources and that have longer-term, relatively illiquid assets can find themselves in a fix when the heightened risk aversion during a crisis leads to sudden stops in net capital inflows and to extreme liquidity strains.

As noted in Section 2, only a few emerging Asian currencies (the Korean won and Indonesian rupiah) sustained large depreciations during this crisis.²⁷ Anderson (2008a) argues that this is because few Asian economies are highly dependent on exports of primary commodities, because Asian economies did not exhibit large switches during the crisis from current account surpluses to significant current account deficits, and because most Asian currencies were not large recipients of "carry trade" money (that had to be reversed once the Japanese yen appreciated strongly during the crisis). Obstfeld et al. (2009) maintain

that the emerging economies whose currencies depreciated heavily in 2008 were those with lower ratios of international reserves to the size of the domestic banking system (measured by M2).²⁸ Interestingly, our nine Asian emerging economies actually held a lower (unweighted) average ratio of reserves to M2 in 2007 (33 percent) than did our group of twelve OEMs (40 percent); see Table 4.²⁹ Still, both Korea and Indonesia had (reserves-to-M2) ratios considerably below the average. The reserves-to-M2 ratio in emerging Asia is lower than one might expect because some very large reserve holders in the region also have relatively large banking systems (so M2 is also large).

But even if currency depreciations in emerging Asia had been larger and more widespread for whatever reason, the region would have been in better shape to absorb them—relative both to the currency mismatch situation in some other emerging economies and relative to the mismatch situation in the region during the Asian financial crisis of 1997–98. Evidence supporting that argument is presented in Table 5.

Table 5 updates the Goldstein-Turner (2004) measure of aggregate effective currency mismatch (AECM) for a variety of emerging economies. The advantage of the AECM is that its coverage of foreign-currency-denominated assets and liabilities is reasonably comprehensive, it normalizes the economy's net foreign currency position by the economy's exports, and it typically takes on large, negative values in the run-up to and during major currency crises.³⁰ A negative value in Table 5 means that the economy has a net liability position in foreign-currency-denominated assets and liabilities. Two observations stand out. First, there is a marked contrast between the large negative currency mismatch in many emerging European economies (especially Latvia, Lithuania, Estonia, Romania, and Hungary) in 2007–08 on the one hand, and the lack of such (negative) currency mismatches in emerging Asia and Latin America on the other; in fact, the only emerging Asian economy with a negative currency mismatch in 2007–08 was Korea and it was small. Second, in four Asian crisis economies of 1997–98 (that is, Indonesia, Korea, the Philippines, and Thailand), currency mismatch was nowhere near the problem in 2007–08 that it was in 1996–98. In short, most emerging economies have reduced currency mismatches over the past decade—particularly some Asian emerging economies. Using ratios of short-term external debt to international reserves—a popular measure that combines currency and maturity mismatches but covers only a limited range of liabilities and assets—yields the same qualitative conclusion.³¹

For the same group of economies, we also looked separately both at the share of foreign-currency-denominated debt in total debt (including local bonds) and at export openness. The numbers that jump out are the high shares of foreign

TABLE 5
**Modified Aggregate Effective Currency Mismatch (AECM),
 Emerging Economies, 2002–2008**

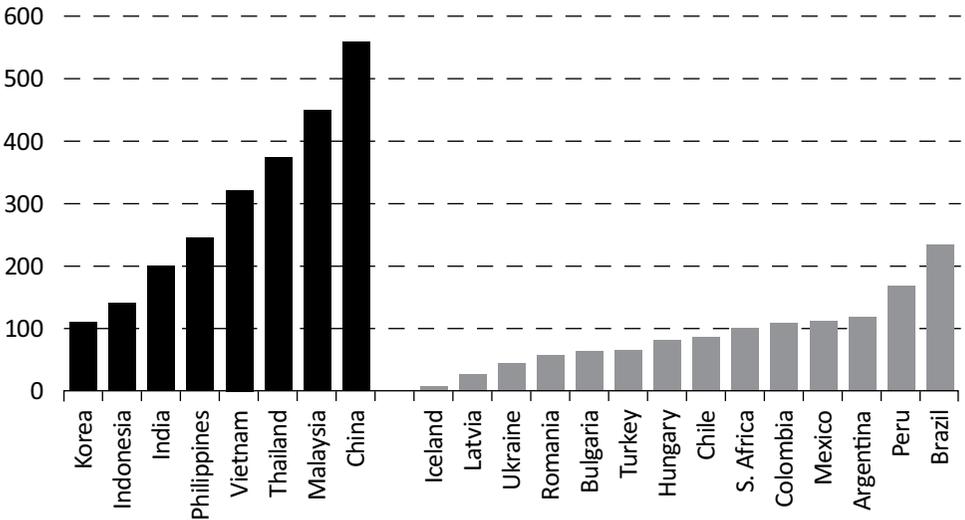
	2002	2003	2004	2005	2006	2007	2008	1996	1997	1998
Asia										
China	7.5	6.9	7.4	7.8	8.2	9.3	9.8			
India	3.9	5.7	5.9	5.2	5.7	8.6	9.7			
Indonesia	3.7	4	2.6	3.1	4.7	6.1	4.3	-14.56	-30.92	-25.31
Korea	2.7	3.8	3.8	3	2.3	1.2	-1.3	-6.16	-12.36	-3.5
Malaysia	0.8	2	3	2.4	3.3	3.8	2.2			
Philippines	-17.4	-21.8	-18.8	-18.1	-7.7	1.3	1.1	-1.98	-7.68	-6.95
Taiwan, China	9.3	13.7	14	12.7	10.9	11.2	10.4			
Thailand	3.5	3.5	3.2	3.7	4	3.8	3.1	-13.65	-20.31	-8.95
Latin America										
Argentina	-237.4	-169.9	-119.9	-33.9	-19.8	-10.0	1.2			
Brazil	-49.2	-29.8	-14.5	-5.9	-2.5	1.8	2.1			
Chile	-8.3	-10.1	-6.0	-3.1	-0.3	-1.3	-2.2			
Colombia	-14.0	-4.6	5.1	3.8	4.8	6.1	7.7			
Mexico		-5.0	-2.9	-0.7	0	0.8	2.6			
Peru	30.8	30.7	27.8	22.1	21.5	27.4	30.6			
Venezuela	11.9	29.1	23.1	18.9	31.1	23.8	22			
Central and Eastern Europe										
Czech	9.9	7.4	6.5	7.3	5.6	4.8	3.1			
Hungary	-12.9	-12.0	-13.5	-18.1	-21.4	-24.9	-31.6			
Poland	8.1	3.8	4	0.3	-2.2	-5.3	-9.8			
Russia	-1.4	2.4	8	13.3	18.6	24.7	19.6			
Turkey	-45.3	-31.9	-21.1	-15.6	-13.8	-13.4	-9.6			
Bulgaria	2.6	5.8	6.8	16.5	19.2	14.5	-5.8			
Romania	-13.8	-14.7	-12.2	-12.1	-15.6	-30.8	-30.9			
Estonia	-3.2	-20.6	-17.1	-14.6	-27.0	-40.6	-37.6			
Latvia	-0.1	-6.9	-19.0	-36.5	-66.4	-104.6	-114.5			
Lithuania	-0.2	-4.1	-9.4	-17.2	-30.2	-48.1	-51.1			
South Africa	2.1	4	4	2.6	3.5	3.2	3.2			

Source: Goldstein and Turner (2004), updated. See Goldstein and Turner for the definition of AECM.

currency debt in much of Central and Eastern Europe—with Bulgaria, Hungary, Romania, Estonia, Latvia, and Lithuania all having foreign currency shares in the 54 to 93 percent range in 2008.³² By contrast (and with the exception of Peru, Argentina, and Venezuela), shares of foreign currency debt are low in Latin America and are particularly low in emerging Asia, with only Thailand having a share above 30 percent. As for export openness, the main contrast is between the still low (but increasing) export openness in Latin America and the greater export openness in both emerging Asia and in emerging Europe.³³

Regarding maturity mismatches and rollover risks, Chart 3 shows the end of December 2008 international reserves as a percentage of estimated 2009

CHART 3
Foreign Reserves over External Financing Requirements, 2009
 (in percent)



Sources: IMF *Regional Economic Outlook: Asia and Pacific*, May 2009.

Note: Gross international reserves (December 2008) in percent of external debt maturing in 2009 (projected) plus projected current account deficit for 2009 (zero, if current account is in surplus).

external financing requirements (where such requirements are defined as the 2009 estimated current account deficit plus external debt maturing in 2009). Again, what is striking is the low rollover risk in emerging Asia (particularly in China, Malaysia, and Thailand) relative to the higher risk in emerging CIS and emerging European economies (along with Iceland).³⁴

To sum up, because the combustible mix of large currency depreciations and large currency mismatches was largely avoided in emerging Asia, this crisis proved less injurious to economic growth there than it could have been.³⁵ Recent experience in emerging Europe underscores the risks when currency and maturity mismatches are not controlled.³⁶

3.2. Foreign Trade Links

When considering how this financial crisis was transmitted from one part of the world to another, it makes sense to consider foreign trade links for at least three reasons; first, it is intuitive that a drop in growth and import demand in the advanced countries hurts emerging economies that export heavily to those

countries; second, as noted in Section 2, all four emerging economy regions have increased their export exposure to the advanced economies (relative to GDP) over the past two decades; and third, empirical studies showing that bilateral trade links are one of the main avenues by which cross-country contagion of crises occurs (e.g., see Eichengreen and Rose 1999, Glick and Rose 1999, and Forbes and Chinn 2003).³⁷ In this subsection, we discuss three aspects of emerging Asia's foreign trade often cited as affecting that region's vulnerability to crisis transmission: the high share of manufactures in total exports, the high share of interregional trade in total trade, and the "export-led" nature of their economic growth.

3.2.1. Primary Commodities versus Manufactures

It is traditional to think of recessions in industrial countries as harmful to (the balance of payments position of) emerging economies reliant on exports of primary commodities, as declines in global demand lower commodity prices.³⁸ This factor suggests that emerging Asian economies would be better shielded from the financial crisis and recessions in industrial countries because, as shown in Table 6, emerging Asia—particularly East Asia—has a higher share of manufactures (and a lower share of primary commodities) in total exports than any other group or region.³⁹ Also evident from Table 6 is the fact that East Asia (but not South Asia) has the highest share of medium- and high-tech exports in total exports.⁴⁰

Recall from Section 2 that, while emerging Asia experienced a small improvement in its terms of trade during this crisis, it also experienced huge peak-to-trough declines in the value of its exports comparable to export declines in other emerging economies. Recent research suggests that two factors may have been responsible for this outcome. First, as suggested by Reinhart and Reinhart (2001), manufactured exports have much higher income elasticities than primary commodities and, hence, the demand for the former can fall sharply during recessions in their major export markets. The cyclical sensitivity of U.S. import demand, for example, is known to be very high and the products exported by emerging Asian economies carry a large weight in U.S. imports.⁴¹ The Asian Development Bank (ADB, 2009b) notes that the electronics industry is more dependent on G-3 markets than other industries, that intra-Asian trade in parts and components in this industry is perhaps larger than in any other industry, and that electronics products display a high world income elasticity.⁴² Second, the medium- and high-tech product composition of emerging Asia's manufactured exports—especially electronics, motor vehicles, and capital goods, makes these exports (because of their big-ticket nature) highly

TABLE 6
**The Product Composition of Exports in Emerging Economies,
 2005–2006 (in percent)**

Area	Economy	Primary commodities in mdse. exports, 2006	Mfd. exports as % of GDP, 2006		Mfd. exports in total exports, 2005	Med/high-tech exports in total exports, 2005
<i>Emerging Asia, avg.</i>		15.5	57.7	<i>Latin America and the Caribbean</i>	63.4	35.4
<i>Non-Asian OEMs, avg.</i>		37.2	13.8	<i>excluding Mexico</i>	51.9	19.1
Asia	Singapore	14.8	156.8	<i>East Asia and the Pacific</i>	91.9	58.9
Asia	Hong Kong	4.6	117.6	<i>excluding China</i>	89.9	61.7
Asia	Malaysia	17.8	75.4	<i>South Asia</i>	86.3	17.4
CEE	Hungary	4.9	55.8	<i>excluding India</i>	84.6	6.8
Asia	Thailand	11.7	47.7	<i>Countries w/economies in transition</i>	50.9	15.8
Asia	Philippines	7.3	34.7	<i>Middle East and North Africa</i>	31.7	8.8
Asia	China	4.5	33.7	<i>excluding Turkey</i>	22.7	4.5
Asia	Korea	9.6	32.7			
CEE	Poland	10.8	25.5	Memo:		
CEE	Romania	17.6	20.9	<i>World</i>	81	50.5
LatAm	Mexico	18.2	19.9	<i>Industrialized economies</i>	85.7	56.6
CEE	Turkey	8	13			
Asia	Indonesia	43.7	12.5			
Africa	South Africa	40.3	11.8			
Asia	India	25.3	8.6			
LatAm	Argentina	20.8	6.9			
LatAm	Brazil	23	6.4			
LatAm	Colombia	45.2	5.3			
CEE	Russia	72.9	5.2			
LatAm	Chile	71	4.3			
LatAm	Peru	56.8	3			
LatAm	Venezuela	94.7	1.8			

Source: UNIDO database and UNIDO Industrial Development Report (2009); World Bank WDI.

sensitive to the very uncertainties and disruptions in finance prevalent during this crisis.⁴³ Mussa (2009) notes that the most credit-intensive components of GDP have suffered large declines, and the same reasoning would suggest that the crisis would fall hardest on exports for which the demand is credit intensive. Unteroberdoerster and Zebregs (2009) report that syndicated loans for trade finance in emerging Asia have contracted at the fastest pace on record. Cardarelli et al. (2009) point out that those emerging Asian economies with higher shares of advanced manufacturing value-added in their GDP suffered sharper output declines in the fourth quarter of 2008.

None of this implies of course that emerging Asia ought to change the product mix of its exports in light of the experience of this financial crisis; there are,

after all, longer-term considerations of comparative advantage and economic growth to take into account. But it does suggest that the sharp distinction in crisis vulnerability between exporters of primary products and exporters of certain kinds of manufactures may be less than advertised, at least for crises aggravated by disruptions in financing.

3.2.2. *Intraregional Trade*

Intraregional exports constitute a higher share of GDP in emerging Asia than in any other emerging market region; in 2001–05, emerging Asia's intraregional exports accounted for 16 percent of its GDP (and 29 percent of GDP for NIEs and the ASEAN-4); the comparable GDP shares for the intraregional exports of other EM regions were 3 percent for Latin America, 9 percent for emerging Europe and the CIS, and 3 percent for sub-Saharan Africa.⁴⁴ In 2006, the intraregional shares of emerging Asia's exports and imports were 40 and almost 50 percent, respectively.⁴⁵ It has sometimes been argued that such a large share of trade with regional neighbors would cushion emerging Asia's exports against a downturn in the advanced economies. The experience of this crisis, along with relevant research, suggests otherwise.

By now, much has (rightly) been made of the huge expansion of intraregional trade in propelling the increase in emerging Asia's share of world trade, the key role of China as a regional assembly hub and export platform in driving this increase in intraregional trade, and the wider efficiency gains for the global economy from an expanded system of "trade in tasks" with increased imported intermediate inputs in all regions.⁴⁶ But prior to this crisis, perhaps not enough has been made of the sensitivity of such global vertical integration networks to a collapse in final demand. Studies by Hori (2007), Cardarelli et al. (2009), and Athukorala and Kohpaiboon (2009) highlight this point, along with the implications for emerging Asia. Hori (2007) notes that a critical distinction between the rise of intra-industry trade in advanced economies and that in emerging Asia is that the former reflects a demand for product variety in the context of large domestic markets, while the latter reflects greater vertical specialization in production targeting foreign markets. Hori's (2007) main point is that intermediate goods are increasingly flowing *into* China, whereas final products are going from China *out of* the region.⁴⁷ Moreover, both Cardarelli et al. (2009) and Hori (2007) show that not only do advanced countries remain the main destination for *final goods* exported by emerging Asia but also that total trade exposure to the advanced economies has increased over time and that the correlation between U.S. import growth and Asian intraregional exports has become stronger. Hence, when final demand in the advanced countries fell during this global

financial crisis, the effects reverberated along the entire vertical supply chain in emerging Asia (and beyond).⁴⁸

3.2.3. (Net) Export-Led Growth

Because the ratio of exports to GDP in emerging Asia is higher than elsewhere in the emerging world, because the Asian export ratio has been rising, and because some emerging Asian economies have engaged in large and prolonged intervention in exchange markets to limit the real effective appreciation of their currencies and to protect their export competitiveness, it is sometimes concluded that economic growth in emerging Asia must be predominantly export-led. We say, not so fast.

The proper way to define (net) export-led growth is to calculate the contribution of *net* exports to GDP growth and then to compare this contribution to that of the domestic components of growth (that is, to consumption and investment).⁴⁹ The contribution of net exports depends in turn on the share of net exports in GDP and on the percentage change in net exports. If, for example, the share of net exports in GDP is small (say, 5 to 10 percent), then even a quite large expansion in net exports may make only a small contribution to growth. Similarly, even when the share of net exports in GDP is relatively high, either an expansion of exports matched by an expansion of imports or a leveling off of a large trade surplus will produce little change in net exports and hence only a small contribution to GDP growth.

Table 7, adapted from Prasad (2009), helps to bring perspective to notions about net export-led growth in emerging Asia over the 2000–08 period. Two observations stand out. First, as shown in column 7, the median contribution of net exports to growth across the nine emerging Asian economies shown in Table 7 was less than 11 percent—and about 15 percent if China is excluded. The dominant contributions to growth were overwhelmingly “domestic”—mostly (total) consumption (61 percent) and investment (27 percent). The economy in Table 7 that could best be described as having net export-led growth during this period was Germany, where almost two-thirds (64 percent) of growth was accounted for by net exports. Japan’s growth over this period was also more (34 percent) net export-led than most of emerging Asia. Second, considerable variation exists across emerging Asia in the contribution of net exports to growth during this period, with Hong Kong (34 percent) and Korea (29 percent) topping the list, and India having a negative contribution (just as in the United States); China is right in the middle for the region (at just below 11 percent). The share of net exports in GDP in China—at 8 percent in 2008, is far below the net export share in Singapore (20 percent), Taiwan (17 percent), Thailand (15 percent), and

TABLE 7
Contributions to Economic Growth, 2000–2008

GDP Economy	Average GDP Growth (1)	GDP Growth Contributions					Net Exports' Share of Contribution to Growth (7) = (6)/(1)	Net Exports as % of GDP, 2008 (8)
		Consumption			Investment (5)	Net Exports (6)		
		Total (2)	Private (3)	Government (4)				
China	10.2	4.1	2.8	1.3	5.0	1.1	10.8	7.9
Hong Kong	5.0	2.3	2.1	0.2	1.3	1.7	34.0	12.2
India	7.2	4.1	3.5	0.5	3.6	-0.3	-4.2	-4.3
Indonesia	5.2	3.1	2.5	0.6	1.4	0.4	7.7	9.6
Korea	4.9	2.5	1.9	0.6	1.0	1.4	28.6	4.4
Malaysia	5.1	4.6	3.5	1.1	0.4	0.1	2.0	13.1
Philippines	5.0	3.9	3.8	0.2	0.7	1.0	20.0	1.4
Singapore	5.5	2.8	2.1	0.6	1.5	1.5	27.3	20.4
Thailand	4.8	2.7	2.4	0.4	1.5	0.5	10.4	15.4
Median:								
All Countries	5.1	3.1	2.5	0.6	1.4	1	10.8	9.6
All excl. China	5.1	3.0	2.5	0.6	1.4	0.8	15.2	10.9
International Comparisons:								
Germany	1.4	0.5	0.3	0.2	0.1	0.9	64.3	6.8
Japan	1.5	1.0	0.6	0.4	0.2	0.5	33.3	4.9
U.S.	2.3	2.3	2.0	0.3	0.1	-0.1	-4.3	-3.3

Source: Prasad (2009); CEIC, IMF's WEO, ADB, and authors' calculations.

Malaysia (13 percent). Most remarkable, the GDP share of private consumption in China, at 35 percent in 2008 (down from 45 percent in 1995) is the lowest in emerging Asia (and probably the world), while its investment share (43 percent in 2008) is the highest in the region. This suggests that the desirable “rebalancing” of economic growth in China will involve a substantial reshuffling among the domestic sources of growth (increasing the share of private consumption in GDP and reducing the share of investment), not just changes in the contribution of net exports to growth.⁵⁰

Three caveats are in order.

First, period averages can conceal considerable variation within the period, and that is the case here—in emerging Asia and China in particular. Recall that between 2003 and 2007, China's global current account surplus rose consistently and sharply from 3 to 11 percent of GDP, and that net exports increasingly became a major factor in China's growth. Whereas net exports accounted for only 5 percent of growth in 2001–04, they constituted 20 percent of growth in 2005–07; this latter development has been instrumental in rising international calls for China to rebalance its growth away from net exports.⁵¹ For our nine Asian emerging economies, the (unweighted) average contribution of net

exports to growth during the 2003–07 period was also significantly higher than for the 2000–08 period. Compared to other EM regions, we calculate that emerging Asia’s growth in 2003–07 was more net export-led than in Africa or emerging Europe but about the same as in Latin America.⁵² Moving to the most recent crisis period, the IMF (2009d) reports that during the fourth quarter of 2008, the decline in net exports subtracted about 250 basis points from growth in emerging Asia (excluding China) versus a decline of about 150 basis points for fixed capital formation. And by the first quarter of 2009, net exports were making a sizeable negative contribution (of roughly 300 basis points) to China’s growth.⁵³

Caveat number two is that, although one can separate the individual contributions to growth in an accounting sense, the various components interact, as rapid falls in Asian exports prompted Asian producers to cut production and slash inventories (thereby inducing declines in investment).⁵⁴ Similarly, significant externalities associated with an export orientation can improve competition and productivity growth more broadly. So too with interaction of policy instruments aimed at rebalancing growth. For example, Goldstein and Lardy (2009) have argued that real effective appreciation of the renminbi would help rebalance China’s economic growth not only by reducing exports and expanding imports but also by facilitating interest rate reform and thereby increasing household income and consumption. Similarly, greater social “safety net” expenditures by the government on education, health, and social security should curtail high levels of precautionary saving and thereby reduce China’s still large external balance.⁵⁵

The third caveat applies to the very exceptional case of a massive, contractionary, global demand and funding shock—as in the fall of 2008. Such a shock will induce a huge fall in both exports and imports worldwide, with large knock-on effects to domestic demand as well. Even if the change in net exports during such an episode is relatively small, this does not imply that the influence of foreign demand on economic growth was minimal. Indeed, in this circumstance, the foreign demand and funding shock can be driving all the components of economic growth, so that trying to allocate the sources of growth as between the domestic and foreign sources of growth becomes a mug’s game.

This issue of “rebalancing” economic growth in (current account) deficit and surplus countries alike is front and center in the ongoing G-20 discussions about sustaining the global economic recovery.⁵⁶ Indeed, if the United States reduces its role as the consumer and importer of last resort, shifts demand from the public to the private sector, and leans more on net exports to support U.S. growth, then U.S. trading partners must simultaneously increase domestic

demand growth in their economies—and particularly so in the larger surplus economies of emerging Asia.⁵⁷ As hinted at earlier, this will not only involve getting real exchange rates to facilitate the shifts in demand across countries but will also call for implementation of a set of policies to increase consumption in the emerging economies.⁵⁸ The challenges and opportunities involved in producing a significant rebalancing of growth in emerging economies should not be underestimated. As highlighted by the Bank for International Settlements (2009), aggregate saving in emerging economies rose more than threefold between 2001 and 2007, with the marginal propensity to save hitting an astonishing 43 percent and with the rise in saving rates especially marked in China and in the Middle East.⁵⁹

To sum up, there is little doubt that foreign trade helped transmit this crisis across borders—especially after the failure of Lehman Brothers froze global credit markets and exacerbated already declining economic activity, along with the demand for imports and supply of exports. But such foreign trade links are a two-edged sword: now that the recovery is under way in an increasingly wide share of the world economy and now that credit markets are functioning better, those same forces should act to reinforce the expansion. In emerging Asia, too much weight was placed on the high shares of manufactures (in total exports) and of intraregional trade (in total trade) as factors that would promote decoupling from shocks in the advanced economies. Going in the other direction, there has been a tendency to confuse high export openness with high net export-led growth in emerging Asia and to overestimate the latter—even though the immediate pre-crisis period (2003–07) was one of increasing net export-led growth in some Asian emerging economies (e.g., China, Singapore, and Malaysia) and even though net exports made a large negative contribution to growth in emerging Asia in the fourth quarter of 2008.

3.3. Financial Integration

As with foreign trade links, any round-up of the most likely suspects for cross-country transmission of crises would have to include financial integration—for at least three reasons.

First, it is easy to tell plausible stories about how high financial integration can help to transmit crises from advanced economies to emerging ones. For example, if advanced country financial firms face large losses at home along with increasing redemption calls, they may liquidate positions in emerging economies or reduce new claims on these economies. Likewise, nationals of emerging economies—anticipating both losses at domestic financial institutions and (local) currency depreciation—may engage in capital flight to avoid

these losses. Large losses on claims of emerging economies against advanced economies may be seen as a threat to the solvency of emerging market financial institutions, prompting “runs” on these institutions. Or domestic banks relying heavily on international borrowing may lose such access during a crisis and cut back on loans to domestic firms, inducing a credit crunch at home.

Second, standard measures of financial integration—whether “de facto” (the sum of foreign assets and foreign liabilities as a share of GDP) or “de jure” (indices based on disaggregated descriptions of national restrictions on financial account transactions)—show increases in advanced and emerging economies since 1970; emerging Asia is no exception to this trend.⁶⁰ Based on the measures put together by Lane and Milesi-Ferretti (2007), seven Asian emerging economies (we exclude Hong Kong and Singapore because of their role as regional financial centers) had about twice the (average) level of de facto financial integration in 2007 as they did in 1985. The Edwards (2007) de jure measure of capital account openness goes in the same direction but shows a slower rate of increase in East Asia and particularly in South Asia. De facto measures also suggest that (average) financial integration in our seven emerging Asian economies just prior to the crisis in 2007 was similar to the average in twelve OEMs.⁶¹

Reason number three is that there is a sizeable and rapidly growing empirical literature concluding that crisis transmission between advanced and emerging economies is greater, other things held equal, when the economies in question have higher levels of financial exposure or integration with one another.⁶²

In this subsection, we review three aspects of the financial integration of emerging Asian economies that seem relevant to this crisis, namely (1) the exposure of emerging Asian economies to the United States and Canada versus the European Union, (2) the implications of the composition of international capital flows for crisis vulnerability, and (3) asset exposure to subprime mortgages and securities as well as troubled Eastern European economies.

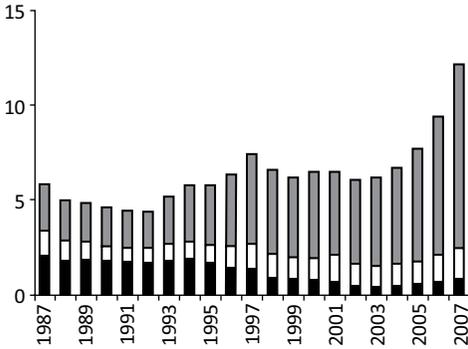
3.3.1. Exposure to North America versus the European Union

Chart 4, taken from Balakrishnan et al. (2009), highlights several characteristics of financial linkages between advanced and emerging economies, as follows: (1) as shown in the top two panels, Western European banks have increasingly dominated cross-border bank lending to emerging and developing countries, whereas portfolio investments come mainly from investors in North America; (2) as shown in the bottom two panels, emerging Asia reflects this general pattern, that is, it does its bank borrowing mainly from Western European banks, while its portfolio exposure (to advanced economies) is predominantly with

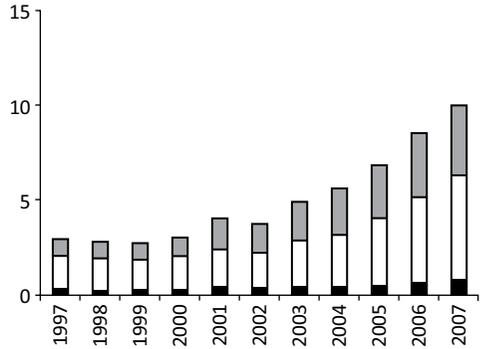
CHART 4

Financial Linkages between Advanced and Emerging Economies

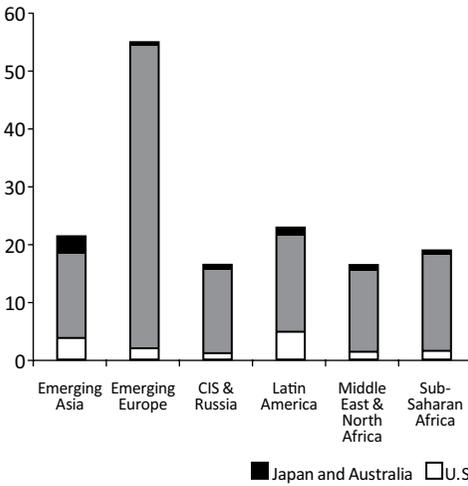
A Assets of advanced economy banks in emerging and developing economies, percent of advanced economies' GDP



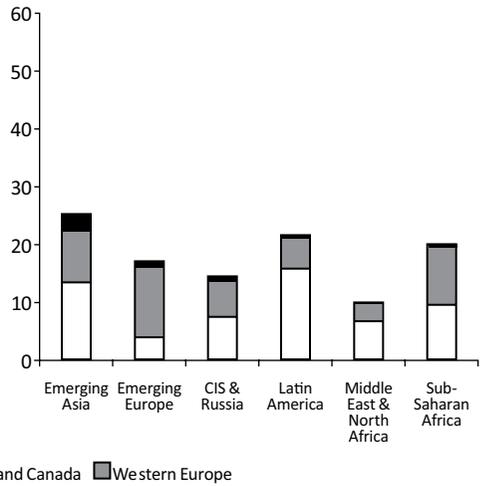
B Portfolio exposures of advanced to emerging and developing economies, percent of advanced economies' GDP^a



C Liabilities to advanced economy banks as of 2007, percent of emerging and developing economies' GDP



D Portfolio exposures to advanced economies as of 2007, percent of emerging and developing economies' GDP



■ Japan and Australia □ U.S. and Canada ■ Western Europe

Sources: Balakrishnan, Danninger, Elekdag, and Tytell (2009); BIS; IMF, Coordinated Portfolio Investment Survey.

Notes: CIS = Commonwealth of Independent States. Bank linkages are measured excluding Australia, Denmark, and Norway. Portfolio linkages exclude Finland, and also Germany and Switzerland prior to 2001.

a Including liabilities and non-reserve assets. The data for 1998, 1999, and 2000 are based on interpolations.

North America; (3) emerging Asia has higher exposure to Japan and Australia than any of the other EM regions, although that Japanese exposure is dwarfed by its exposures to Western Europe or North America; and (4) relative to GDP, emerging Asia's bank borrowing and portfolio exposure in 2007 were roughly

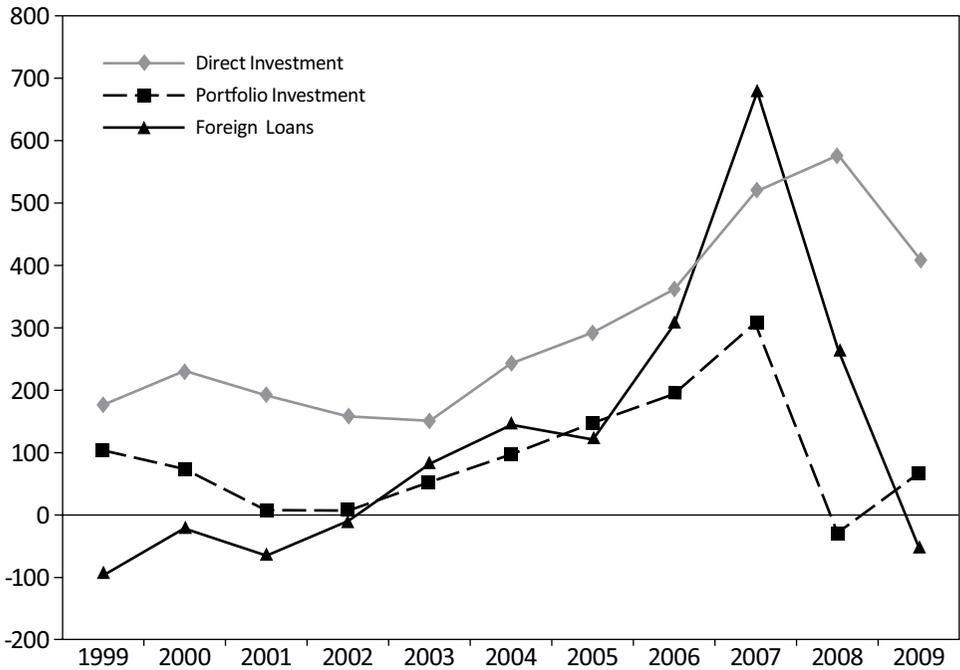
similar to that of other emerging market groups—with the exception of the extremely high level of bank borrowing in emerging Europe. In the 1997–2007 period, emerging Asia has reduced (relative to GDP) its liabilities to advanced economy banks while increasing its portfolio exposure to the advanced economies. A more detailed breakdown of emerging Asia’s external portfolio assets and liabilities reveals that exposure to the United States on both sides of the balance sheet is higher than its exposure to any other advanced country region.⁶³ The largest percentage decline in emerging Asia’s net private capital flows during this crisis period (the percentage change between the 2005–07 average and the estimated level in 2009) occurred in private portfolio flows.

Thus, despite the smaller role played by net private portfolios relative to other components of net private capital flows and despite the fact that North America is not a close neighbor, the gross exposures are large enough that emerging Asia’s financial stability is relatively sensitive to security market developments in North America. At the same time, the fact that emerging Asia is not as dependent on foreign bank loans (from advanced economies) as say, emerging Europe (20 percent of GDP versus 50 percent of GDP, respectively) and has (again in contrast to emerging Europe) reduced that exposure somewhat over the past decade, has proved to be helpful: judging from recent research (Balakrishnan et al. 2009), it was the emerging economies that were most dependent on foreign bank loans that suffered the most contagion of financial stress (from the advanced economies) during this crisis.⁶⁴

3.3.2. Composition of Private Capital Flows

A long-running debate centers on whether different types of capital flows imply different levels of vulnerability to balance of payments crises. Some studies find that foreign direct investment (FDI) is more stable (e.g., Berg et al. 2004) or more difficult to liquidate than other types of capital flows (portfolio financial flows and bank loans), while others either find little difference in persistence and procyclicality (Levchenko and Mauro 2007) or are skeptical that (when perceived crisis vulnerability increases) FDI investors will not be able to hedge their exposure in ways that are economically equivalent to other creditors—even if that hedging is not reflected in the behavior of the FDI series itself (Claessens et al. 1995). Recently, Tong and Wei (2009) have offered a new test of the effect of capital flow composition, using data on 3,823 firms in 24 emerging economies during the 2007–09 crisis. They report that for the 24 emerging economies in their sample, the rise and fall of international bank loans during the 1999–2009 period was sharper than for portfolio investment and much sharper than that for flows of FDI; see Chart 5 on gross capital inflows. After

CHART 5
Capital Flows to Emerging Economies, 1999–2009



Source: Tong and Wei (2009); IMF's World Economic Outlook database. The sample includes 24 emerging economies.

controlling for other factors, Tong and Wei (2009) find that a higher pre-crisis share of non-FDI capital inflows worsens the credit crunch faced by these firms; a higher share of foreign bank loans in total capital inflows seems to be particularly troublesome.

We looked at IMF data on net private capital inflows for the 2005–09 period for groups of emerging economies—also broken down into private direct investment, private portfolio flows, and other private capital flows (of which the largest component is bank loans). The highlights are (1) emerging Europe had both the largest net capital inflow in the pre-crisis period (2005–07) and sustained by far the largest percentage sudden stop in total net private flows (11 percent of GDP) between 2005–07 average and estimated 2009; (2) emerging Asia is next in line, with a sudden stop of almost 2 percent of GDP; (3) the sudden stop in emerging Asia this time is considerably smaller than during the Asian financial crisis of 1997–98 (2 percent of GDP now versus 5 percent then); (4) in emerging

Europe, the largest percentage sudden stop during this crisis was in other private capital flows; (5) in contrast, in both emerging Asia and in Latin America, the component dropping the most was private portfolio flows; and (6) emerging Asia and Latin America had the highest shares of FDI in total net private flows during the pre-crisis period, while emerging Europe had by far the lowest FDI share.

It therefore looks like emerging Asia had another clear advantage relative to emerging Europe in the run-up to this crisis—not only was Asia more moderate in the scale of net private capital inflows but also it relied more heavily on more stable forms of private net capital flows—especially FDI. The debt-equity mix of foreign finance may also be at play here and this too would be in emerging Asia’s favor. In this connection, Rogoff (1999) has argued that crisis vulnerability in emerging economies would be reduced if capital flows to these economies took the form of equity and direct investment: there would be an automatic device for risk sharing, country runs would lead to sharp falls in local stock markets but there would be no liquidity effects, and there would be less need for a crisis manager or lender of last resort.

3.3.3. Subprime Exposure and Lending to Troubled Economies in Emerging Europe

Two prominent characteristics of this financial crisis have been large estimated credit losses on U.S. originated subprime loans and securities, and large potential credit losses on loans to certain troubled economies in emerging Europe. The IMF’s *Global Financial Stability Report* (IMF 2009c), for example, has estimated that global credit losses on U.S. originated subprime loans and securities alone could exceed \$800 billion. Meanwhile, Deo (2009) has estimated that Austria has 67 percent of GDP in financial systems claims on emerging Europe, including over 25 percent of GDP in claims on what is regarded as the “high risk” group within emerging Europe (assumed to be Bulgaria, Estonia, Hungary, Latvia, Lithuania, Romania, and the Ukraine); the overall (emerging European) exposures of Belgium and Sweden were also estimated to be high (27 and 22 percent of GDP, respectively).

The ADB (2009a) has estimated that non-Japan Asia has accounted for less than 3 percent of global credit losses in this crisis. Kawai et al. (2008) figure that Asia’s (including Japan) subprime losses amounted to less than 2 percent of the region’s bank capital; the comparable ratios for China, Korea, and Malaysia were 1, 0.5, and 0.3 percent, respectively. The IMF (2009d) places exposure in Asia (excluding Japan) to subprime and related assets (collateralized debt obligations and structured investment vehicles) at \$20–30 billion (or 5 to 10 percent

of bank capital) and estimates the likely losses on these assets at \$2–5 billion.⁶⁵ The IMF (2009d) goes on to argue that limited reported exposure to subprime related products in emerging Asia reflects several factors: an early stage of involvement in the overall securitization process, less pressure to search for yield because of the continued profitability of bank lending (including consumer lending), less emphasis on trading activities, and a more proactive stance of regulators (at least in Hong Kong, Singapore, and the Philippines) in insisting that local banks had sufficient risk-management capacity before investing in complex structured products.

Judging from lists of the creditor economies most exposed via bank loans to troubled economies in emerging Europe (inclusive of the CIS economies), the emerging Asian economies appear to have little creditor presence in this region; whether this reflects an unfamiliarity with Eastern Europe's borrowers, or the lack of a perceived comparative advantage vis-à-vis European lenders or a more conservative assessment of risk, or some combination of all of these is unclear.

To sum up, international capital flows and asset price changes were another important link transmitting this crisis from the advanced economies to emerging Asia. Relative to most other emerging market regions, emerging Asia is sensitive to falls in equity and bond prices in the United States and to knock-on effects of such losses (and of broader increases in risk aversion) by North American investors in Asia. At the same time, emerging Asia (in contrast to emerging Europe) benefited from not having increased its exposure to G-3 banks (at least relative to GDP) in the decade preceding this crisis, from relying more heavily than other EM regions on (relatively stable) FDI inflows, and from having avoided large credit exposures to U.S. originated subprime loans and securities and to the troubled emerging Europe.⁶⁶

3.4. Scope for Implementing Countercyclical Policy Responses

The impact of a crisis in the advanced economies on emerging economies does not depend solely on the size of the external shock and on the structural parameters or exposures that help determine how that shock works its way through the economy. The ability to implement countercyclical monetary and fiscal policies also matters. Indeed, recall that there was considerable controversy during the Asian financial crisis about whether the crisis economies should or could have acted sooner or more aggressively to implement programs of monetary and fiscal stimulus even though their currencies and external borrowing costs were under strong adverse market pressure.⁶⁷ Some empirical studies also find that most emerging economies have typically not used monetary and fiscal policy in

a countercyclical manner during earlier financial crises.⁶⁸ This time, the picture looks different. Because an analysis of policy responses in Asia during this crisis is the main focus of at least one other paper presented at this conference, we restrict ourselves to some summary observations.

All nine Asian emerging economies in our sample reduced policy interest rates during the June 2008 to June 2009 period, with the (unweighted) average reduction being 200 basis points; India, Korea, and Hong Kong had the largest interest rate cuts, while Singapore and the Philippines made the smallest ones.⁶⁹ In sharp contrast, during the Asian financial crisis (June 1997 to July 1998), the average change in policy interest rates for these same nine Asian emerging economies was an increase of 740 basis points. Reflecting the global nature of this crisis, the twelve OEMs also aggressively reduced policy interest rates during this crisis; in fact, the average interest rate reduction in this non-Asian group was 100 basis points larger than for our nine Asian economies.⁷⁰

Fiscal policy stimulus has also been a prominent feature of the crisis policy response—both inside and outside emerging Asia. The World Bank (2009) concludes the following: (1) within emerging Asia, the fiscal stimulus package in 2009–10 is largest in China, Malaysia, Singapore, and Korea, and smallest in Thailand, Indonesia, and the Philippines;⁷¹ (2) most of these stimulus packages are heavily biased in terms of expenditure packages (with only a sixth of the overall regional stimulus accounted for by tax cuts);⁷² (3) in most Asian economies, the effects of the fiscal stimulus will only partially offset the impact of the crisis on GDP (leaving still sizeable output gaps, particularly in Thailand, Malaysia, and Korea); and (4) for 2009, the emerging Asian stimulus packages are (on average) larger than those in the United States, the euro zone, and Japan. Despite the fact that most of China's fiscal stimulus package was directed at infrastructure spending, Lardy (2009) reports that household consumption growth in China during the first quarter of 2009 was higher than anywhere else in the emerging market world.

As noted in Section 2, private credit and bank lending growth have held up better in emerging Asia during this crisis than in other EM regions. Within emerging Asia, bank lending growth has been particularly rapid in China, India, and Indonesia, while slowing (from moderately to sharply) in most of the region's other economies. In China, bank lending growth in the first six months of 2009 was greater than for all of 2008. While such rapid lending growth in China was clearly part of the recovery strategy of the Chinese authorities, there are concerns that if the pace of that lending is not brought down to more sustainable levels in the second half of the year, the adverse consequences in terms of deteriorating asset quality and future credit losses could be considerable.

A number of analysts have looked at the factors enabling emerging Asia to implement countercyclical macroeconomic stimulus during this crisis. Some conclusions warrant mention.

On the monetary policy side, as noted in Section 2, headline and core inflation rates in emerging Asia have been declining at or below pre-crisis levels. The crisis has also generated sizeable output gaps which should limit inflationary pressures. Not only are there fewer hard pegs in the region than a decade ago but also the global nature of the crisis has meant that other countries—including the reserve currency economies—have been reducing their interest rates, thereby reducing potential monetary policy conflicts for those Asian economies with heavily managed exchange rates. Moreover, most Asian economies have enough international reserves to fund significant intervention operations in the event of problematic currency pressures.

As for fiscal policy stimulus, aggressive action was possible because the factors that typically raise concerns about longer-term debt sustainability—whether for public debt or external debt—were not operative for most Asian emerging economies.⁷³

As indicated in Section 2, Asian emerging economies have not needed during this crisis to provide government financial support for troubled financial institutions on anywhere near the scale (relative to GDP) applicable to the major industrial countries. The IMF (2009c) has calculated the primary surplus in the budget needed either to stabilize the ratio of debt to GDP or to bring that ratio to the pre-crisis benchmark. For the six Asian emerging economies examined, the needed primary surplus was below 1 percent in three of them (China, Indonesia, and the Philippines), and just above 1 percent in two others (Korea and Malaysia); only in India (which had a projected 2014 public debt ratio of 70 percent before the crisis and a revised 2014 projection of 77 percent now) is the required primary surplus—at 3 percent of GDP—quite challenging.⁷⁴ Among the six larger Asian emerging economies, only India and the Philippines have net public debt ratios above 50 percent. The (unweighted) average ratio of total external debt to GDP for our nine Asian emerging economies is also low—at 28 percent (versus an unweighted average of 35 percent for the twelve OEMs), and only the Philippines had a pre-crisis ratio of above 40 percent. As indicated in Section 2, emerging Asia's current account balance going into this crisis was a surplus of 6 percent of GDP.⁷⁵

Anderson (2008a) has constructed systemic risk indices for nearly 50 emerging economies. He combines an external risk index (encompassing the export-GDP ratio, the current account balance as a share of GDP, gross external debt as a share of GDP, and official foreign exchange reserves as a share of gross

external debt) with a financial risk index (encompassing the loan-to-deposit ratio in the banking system, the increase in the loan-to-deposit ratio over the past five years, the increase in the credit-to-GDP ratio over the past five years, and gross public debt as a share of GDP). The results underline the fragility of the emerging European economies, as nine of the ten most risky economies are from that region (led by the three Baltic economies). The Asian economy with the highest risk rating was Korea, which ranked 14th; the other eight Asian emerging economies were all rated in the low-risk category, with China getting the lowest risk rating in the entire emerging market sample. Lardy (2009) lends further support for the low risk assessment for China by noting the following: in 2007 public sector debt, household debt, and financial sector debt—each expressed as a share of GDP—were much lower in China than in the United States; foreign direct investment was financing less than 4 percent of China's fixed asset investment in 2007; foreign portfolio investment in China's stock market represented only 20 percent of market capitalization in 2007; and about 40 to 50 percent of new medium- and long-term bank loans during the 2006–09(Q2) period were for infrastructure (which is less speculative than property lending and less prone to excess capacity problems than bank lending going to manufacturing).

Turner (2007) found that income and balance sheet data had improved substantially in most Asian banking systems in the decade after the 1997–98 crisis but also that share prices, operating costs, and credit ratings had fared less well.⁷⁶ More recently, both the ADB (2009a) and Pomerleano (2009) have evaluated Asian banking performance—comparing conditions in the early part of this decade with those for the recent crisis period. The ADB (2009a) finds across-the-board improvements in nonperforming loan ratios, provisioning ratios, profitability, and risk-weighted capital ratios. Pomerleano (2009) also sees marked improvements in asset quality and in capital adequacy, along with relatively low reliance on wholesale funding (with the notable exception of Korea). But Pomerleano (2009) also points out that “stand alone” credit ratings (e.g., Moody's bank financial strength ratings) continue to award low ratings to most of the region's banking system (with the exception of Hong Kong and Singapore) and that these poor ratings probably reflect concerns that there will be substantial pressure on loan quality going forward in this crisis.⁷⁷ Jain-Chandra et al. (2009) emphasize that the collapse of global demand in this crisis has decimated corporate revenues in Asia and that financing has proven hard to find outside of the highest rated and most established companies. They find that (1) the risk of corporate defaults is unusually high but much smaller than at the time of the Asian financial crisis; (2) the risks are manageable because the corporate sector entered this crisis

with low leverage ratios and high profitability; and (3) losses to creditors (excluding shareholders) from defaults in Asia as a whole could amount to about 2 percent of GDP, while bank losses could total roughly 1 percent of their assets.

To sum up, emerging Asia had more room for maneuvering in the conduct of countercyclical monetary and fiscal policy during this crisis because its macro and balance sheet fundamentals were more robust when the crisis struck—both relative to some earlier crises and relative to most other emerging market groups (especially emerging Europe).

4. Concluding Remarks

This paper has examined various dimensions of the impact of the global credit crisis on emerging Asia. If we had to choose two adjectives to provide a shorthand description of this impact, we would opt for “mixed” and “unexpected.”

As detailed in Section 2, the (estimated) growth declines in emerging Asia during this crisis have not been as severe as those experienced either by the CIS economies or by the five most affected Asian emerging economies during Asia’s own financial crisis of 1997–98. At the same time, Singapore, Hong Kong, Malaysia, and Korea have suffered very large growth declines during this crisis, and even China and India saw their economic growth rates plunge to about half their pre-crisis peaks. At the height of this crisis, emerging Asia looked a lot like other emerging market groups in terms of peak-to-trough changes in exports and in equity prices, or spikes in indices of financial stress. Estimates of the cross-country spillover effects of crises in advanced economies on emerging economies typically place emerging Asia in the middle of the pack. On the other hand, emerging Asia has not had to commit anywhere near the government financial support to troubled financial institutions that was committed in some of the largest advanced economies, and its international reserves, exchange rates, and domestic credit flows have been less severely affected than most emerging market counterparts. Just as important, there are some initial indications that emerging Asia may rebound from this crisis earlier and more strongly than most other emerging market groups.

Those who thought that emerging Asia would decouple from the crises in the advanced economies, and particularly from the crisis in the United States, have been surprised and disappointed. Perhaps they underestimated the extent of trade and financial market exposure and integration between emerging Asia on the one hand and the United States and the European Union on the other. Perhaps they overestimated the cushioning that emerging Asia would receive from its relatively high share of intraregional in total trade or its relatively low share of primary commodities in total exports. And perhaps they underappreciated

the degree to which the failure of Lehman Brothers—coming on top of the earlier troubles at some large U.S. financial institutions—would induce a watershed increase worldwide in uncertainty about the creditworthiness of counterparties and the implicit rules of the game in crisis management and how that in turn would paralyze private financial flows.

By the same token, those who despaired at the worst of this crisis that emerging Asia's improved economic fundamentals (from a decade earlier) would not limit the size of the downturn and that the region would experience a prolonged slump have also been surprised—this time by the vigorous rebound of the past six months. Perhaps they overestimated the degree to which economic growth in emerging Asia has been (net) export-led. Perhaps they failed to appreciate that emerging Asia's strong external position, its control of currency and maturity mismatches, and its lower reliance on wholesale international funding would dampen the balance sheet effects of the crisis. Perhaps they underestimated the helpful role played by control of inflation, relatively good debt dynamics, and improved banking system fundamentals in permitting emerging Asia to implement a more aggressive fiscal and monetary policy response to the crisis. And perhaps they didn't pay enough attention to *Mussa's* (2009) business cycle guideposts that deep recessions are almost always followed by steep recoveries, and that in a highly synchronized global business cycle (like this one) foreign trade multipliers are mutually reinforcing—as much in the upturn as in the downturn.

And perhaps a year or two from now, when much more will be known about the strength and durability of the recovery, we will be in a better position to judge whether the whole crisis episode is best regarded as a demonstration of emerging Asia's vulnerability, or its resilience, or both.

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NOTES

1 See, for example, Bernanke (2007).

2 See IMF (2009f).

3 IMF (2009c).

4 See Mussa (2009).

5 For example, the Blue Chip International Consensus forecast of August 21, 2009, estimates that China's 2009 growth will be 7½ percent—the same figure as given in the IMF's July 2007 WEO update. More recent forecasts are higher still.

6 Our Asian emerging market group can be described as China and India plus the ASEAN-5 (Association of Southeast Asian Nations) and newly industrialized Asian economies, except that we have excluded Vietnam.

7 As a share of the total for our nine emerging Asian economies, China accounts for 48 percent of the group's GDP, 42 percent of its exports, 54 percent of its stock market capitalization, 92 percent of net capital inflows, and 60 percent of its international reserves.

8 There are, of course, alternative ways of calculating the growth decline. For example, another approach is to use the difference in growth rates between 2009 and 2007 expressed as a percentage of the 2007 growth rate. One disadvantage of this approach is that it produces very large growth declines for economies that had low growth rates in 2007. For example, consider the cases of Hungary and Singapore. Hungary's real GDP growth declined from 1.1 percent in 2007 to (a projected) -3.3 percent in 2009, while Singapore's growth fell from 7.8 percent in 2007 to (a projected) -10.0 percent in 2009. Using the percentage decline in growth rates, Hungary would show up as having experienced a much larger growth decline (-412 percent) than Singapore (-229 percent). In contrast, using the absolute difference in growth rates, Singapore shows by far the larger growth decline (-17.8 percent versus -4.4 percent for Hungary). We think the absolute difference approach is a better choice in this context. Admittedly, using forecast growth rates for 2009 (made in June/August 2009) introduces an error to the extent that these forecasts subsequently get revised significantly or miss the mark; on the other hand, measuring the growth decline using data on reported GDP, say, just during 2008 or through only early 2009 runs the risk of missing important information in 2009—when one is still unsure about the timing and durability of the recovery.

9 Yellen (2007) and Ito (2007) provide a comparison between conditions in the Asian crisis countries in 1997-98 and conditions a decade later.

10 Although we do not show the components of growth in Table 1, most of the decline in growth in Asian emerging economies during the fourth quarter of 2008 reflected a fall in net exports, followed by declines in private investment, and consumption; for the crisis period as a whole, it has been declines in net private investment that have made the largest negative contribution to growth; see IMF (2009d) and Anderson (2009).

11 Using the projections from the IMF's July 2009 update of the WEO (IMF 2009a), the projected 2009 average (unweighted) inflation rate is 2.5 percent for the (nine) Asian emerging economies shown in Table 2 versus 8 percent for the (twelve) non-Asian OEMs. It should

be noted, however, that the regional average hides considerable variation within emerging Asia; for example, the projected 2009 (headline) inflation rates for Thailand and Indonesia are above 6 and 5 percent, respectively, while Singapore, Korea, and Hong Kong are expected to have inflation rates below 2 percent. Recall too that India and Indonesia had (headline) inflation rates in 2008 that were about 10 and 11 percent, respectively.

12 Preliminary figures suggest that China's current account surplus for the first half of 2009 was in the neighborhood of 6 percent of GDP.

13 The April 2009 WEO (IMF 2009e) expects the current account surplus of the Middle Eastern economies to fall from 18 percent of GDP in 2007 to -0.6 percent in 2009; moreover, all the other EM regions are expected to run current account deficits in 2009, with the largest deficits appearing in Africa (-6.1 percent of GDP) and in Central and Eastern Europe (-4.1 percent of GDP).

14 See IMF (2009e).

15 During the Asian financial crisis, the average decline in equity markets for eight Asian emerging economies over the June 1997–May 1998 period was 32 percent; see Goldstein (1998).

16 Between June 1997 and July 1998, the (unweighted) average depreciation for nine Asian currencies vis-à-vis the U.S. dollar was 28 percent versus 5 percent for the July 2007 to June 2009 period; the difference between the two periods is equally marked if we use real effective exchange rates or if we look at peak-to-trough declines.

17 See BIS (2009). The regional differences are even more marked if one looks at holdings of international reserves relative to GDP.

18 See Committee on the Global Financial System (2009).

19 See, for example, Calvo and Talvi (2005).

20 We provide further discussion of the sudden stop in net private capital inflows—including the composition of such flows, in Section 3.

21 As an example of how “other” factors can influence bottom-line outcomes, the run-up in inflation rates in emerging economies between the middle of 2007 and the middle of 2008 had its origins primarily in global commodity price developments and in strong aggregate demand pressures—not in the outbreak of the financial crisis itself. This rise in inflation induced monetary tightening in many emerging economies, including those in emerging Asia, and this in turn affected real GDP growth. Attributing all the fall in real GDP growth between, say, the middle of 2007 and middle of 2009 to the financial crisis would thus overestimate the influence of the crisis on economic growth.

22 In addition to these studies, there have been a few recent attempts to relate indices of crisis severity or economic growth slowdowns during this crisis to a wide set of indicator variables, where these indicators are meant to capture either causes of the crisis or crisis vulnerability, country by country. In this regard, Rose and Spiegel (2009) consider over 60 such causal variables and report that hardly any of them are statistically significant. In a similar vein, Goldstein and Xie (2009) look at growth slowdowns over the 2007–09 period within emerging Asia and attempt to link these to averages for 66 indicators of vulnerability. We,

too, find that hardly any of the individual indicators are statistically significant, although one does somewhat better when considering averages of indicators across the whole set of crisis transmission and policy response channels. A problem, however, with using just an emerging Asian sample is that one has very few observations.

23 We ignore for expositional purposes lags of the dependent and independent variables.

24 A very similar exercise was undertaken earlier by Forbes and Chinn (2003) but looking at cross-country transmission of bond and stock market returns, not financial stress. For the nine emerging economies taken as a group, the transmission effect (that is, the estimated $B2$ in equation 1), was lower than that for emerging Europe but higher than that for Latin America.

25 One reason for Korea's high sensitivity is the increased dependence of Korean banks on international wholesale funding. According to the BIS, the external debt of Korean banks (including the Korean branches of foreign banks) rose from \$75 billion at the end of 2004 to \$210 billion at the end of June 2008; see Committee on Global Financial System (2009). Truman (2009) finds that Korea also had a relatively large economic growth shortfall during the global recession of the early 1980s.

26 Although the emphasis in this paper is on how emerging market regions differ in ways that matter for crisis vulnerability, we do not want to underplay the role of common risk factors in this crisis or in earlier ones. Eichengreen et al. (2009), examining the evidence from credit default swap spreads for the 45 largest financial institutions in the advanced economies, conclude that the influence of common risk factors rose to exceptional levels from the outbreak of the subprime crisis to past the rescue of Bear Stearns and then rose further after the failure of Lehman Brothers. Goldstein (1998), in analyzing contagion during the Asian financial crisis of 1997–98, argues that the crisis in Thailand acted as a “wake-up call” to investors about long-standing problems in the financial sector and that there followed a sharp write-down in all those Asian economies where financial sector fragilities were likewise judged to be serious.

27 Cline and Williamson (2008) found that only one of our eight Asian emerging economies—namely, Korea—had an overvalued real effective exchange rate (as of February 2008) and the estimated overvaluation was small.

28 The argument here is that countries with large banking systems need to hold large reserves since liability holders may decide to “run” from these claims into foreign currency during a crisis.

29 One reason why the average for OEMs is so high is that some economies like Russia have large reserve holdings but a relatively small banking system (i.e., low M2).

30 The AECM covers net foreign assets of the monetary authorities and the deposit money banks; the foreign currency assets and liabilities of nonbanks vis-à-vis BIS reporting banks; international debt securities outstanding, denominated in foreign currency; the foreign currency share of total debt; and exports of goods and services. The adjective “modified” denotes that the foreign currency share of domestic bonds is also included in the calculation. See Goldstein and Turner (2004) for a detailed definition and discussion of the AECM and its behavior during earlier currency crises in emerging economies.

31 The ratios of short-term external debt to international reserves in 2007–08 are also way lower for the Asian crisis economies than they were during the Asian financial crisis.

32 These currency mismatches would go even higher, of course, if those economies with exchange rate pegs opted in the end to abandon them.

33 When export openness is high, it takes (*ceteris paribus*) a smaller currency depreciation to earn the foreign exchange needed to service foreign currency debt.

34 We also examined ratios of short-term external debt to GDP. Here we found that (with the exception of Korea) the crisis economies during the Asian financial crisis have reduced significantly their reliance on short-term external debt vis-à-vis 1996–97. On the other hand, the 2007 (unweighted) average of short-term external debt to GDP in emerging Asia was slightly higher than the (unweighted) average for non-Asian emerging economies.

35 We would make a distinction between currency mismatches and a global shortage of dollar and euro liquidity; it was the latter that was a major problem for most emerging economies after the failure of Lehman Brothers. Emerging Europe suffered from both those problems. Banks and corporations in some emerging economies (e.g., Korea) also exacerbated the global liquidity problem by taking actions in the run-up to the crisis that left them short of dollar-euro liquidity.

36 The risks in emerging Europe—and especially in some of the CIS economies—have been well known for some time; see, for example, Goldstein (2007).

37 Between 1981–85 and 2001–05, the ratio of exports to sum of the United States, the euro area, and Japan (expressed as a share of the exporting area's GDP) has increased from 10 to 15 percent for emerging Asia, 20 to 22 percent for Latin America, 7 to 16 percent for emerging Europe and the CIS, and 9 to 13 percent for sub-Saharan Africa; see Helbling et al. (2007). It should be recognized that the ratio of exports to region i (X_i) to GDP (Y) can be written as: $(X_i/GDP) = (X_i/XT)(XT/GDP)$, where XT is total exports. Put in other words, the ratio of exports to the advanced countries to GDP can go up over time even if the share of exports to advanced countries to total exports is falling so long as overall export openness (XT/GDP) is increasing by more. In the case of emerging Asia, the share of exports to the U.S., euro area, and Japan to total exports has actually fallen as between 1986–90 and 2001–05, but the share of those exports in GDP has gone up due to rises in overall export openness.

38 See, for example, Dornbusch (1985).

39 Within emerging Asia, Singapore and Hong Kong have the highest ratios of manufactured exports to GDP, while India and Indonesia have the lowest ones. The BIS (2009) notes that primary commodities account for approximately 40 percent of total exports in Latin America.

40 There is also a literature on “growth accelerations” (e.g., Johnson, Ostry, and Subramanian 2007) that suggests that increasing the share of manufactures in total exports is one of the main elements of such an acceleration. UNIDO (2009) documents that most regions have increased both the share of manufactured exports in total exports and the share of complex exports between 2000 and 2005. The same report indicates that East Asia and the

Pacific, especially China, dominate developing-country manufacturing—accounting for 61 percent of manufacturing value-added of developing countries in 2005 and for 74 percent of the 2000–05 increase in the value of manufacturing exports of all developing countries.

41 Helbling et al. (2007) report that the share of consumer durables and capital goods in total U.S. imports during 2005 was almost 49 percent (versus a share of these goods in domestic final demand of only 8 percent) and that industrial raw materials took up another 31 percent of U.S. imports; they characterize the import demand for these goods as cyclically sensitive.

42 The electronics industry is highly important in Korea, Malaysia, the Philippines, Singapore, and Taiwan; see ADB (2009a). Recall also that the IT sector was largely responsible for the economic slowdown in East Asia during the 2001 U.S. recession.

43 See Cardarelli et al. (2009). They note that Japanese auto exports fell by nearly 70 percent between September 2008 and March 2009. The BIS (2009) reports that the automobile sector accounts for 8 percent of GDP in Korea and Thailand, and that the inventory-to-sales ratio for Korean information technology products went up sharply between September and December 2008. Unterroberdoerster and Zebregs (2009) conclude that syndicated loans for trade finance in emerging Asia as a whole have contracted during this crisis at the fastest pace on record and by more than the world average.

44 See IMF (2007b). The GDP share of emerging Asia's exports going to the U.S., euro area, and Japan combined during the 2001–05 period was 15.5 percent—slightly lower than the share going to intraregional exports.

45 Hori (2007) shows that the interregional share of total exports in emerging Asia is now approaching the interregional shares in the North American Free Trade Agreement and the European Union.

46 Hori (2007) observes that during the 1990 to 2006 period the share of emerging Asia in world trade flows increased from 21 percent to 34 percent, that intraregional trade within emerging Asia expanded by 8.5 times (versus 3 times for trade flows outside emerging Asia and 5 times for interregional trade involving emerging Asia), and that China-related trade flows increased by 12 times. UNIDO (2009) reports that the growth of trade in tasks (proxied by the growth of imported intermediate inputs as a share of both inputs and output) has been impressive between 1986–90 and 2000.

47 Anderson (2008a, b) puts forward a similar view. If one looks at the value of final shipments to advanced economies as a share of emerging market GDP, this ratio increases at a much slower pace over the past decade than headline figures of exports to GDP. He also observes that headline ratios of exports to GDP for Asian emerging economies are much higher than ratios of value-added in exports to GDP and that a comparison of the standard deviation of net exports to the standard deviation of GDP is not kind to the conclusion that China's export is "export-led."

48 The BIS (2009) notes that China's import demand accounts for roughly 20 percent of the exports of other Asian emerging economies.

49 We make a distinction between *net* export-led growth and export-led growth for two reasons: first, in the development literature, export-led growth is usually not associated with a rising trade surplus, and second, all our calculations relate to the contribution of net exports to economic growth.

50 See Lardy (2007).

51 See Goldstein and Lardy (2009). Some would argue that over a period as long as a decade, the appropriate benchmark for the contribution of net exports to growth is zero.

52 Within emerging Asia during 2003–07, we find that Singapore, Malaysia, and China had the most net export-led growth, while the contribution of net exports to growth was negative in India and Indonesia.

53 See Lardy (2009).

54 More broadly, investment may be partly driven by exports. An increase in export-oriented investment will in the short run lead to increased imports of capital goods (or raw materials for construction); hence, it will reduce net exports but, by raising productive capacity for exportables, it will increase net exports in the long run.

55 Goldstein and Lardy (2009) note that such social expenditures in 2008 were well over twice the level of 2004.

56 See, for example, Bergsten and Subramanian (2009).

57 See Blanchard (2009).

58 See Prasad (2009) and Goldstein and Lardy (2009) for the kinds of policy measures in emerging Asia and in China, in particular, that would support such a rebalancing of growth. Goldstein (2009) also spells out a “grand bargain” that would offer the emerging economies more “insurance” and more significant governance gains at the IFIs in exchange for emerging economies’ greater adherence to the international “rules of the game” on exchange rate policy, trade policy, and external adjustment.

59 The BIS (2009) calculates that the aggregate saving rate (relative to GDP) in China was almost 58 percent in 2007.

60 See IMF (2007b) and Obstfeld (2009).

61 Within emerging Asia, the highest levels of de facto financial integration—again, excluding Hong Kong and Singapore—were in Malaysia and Korea, and the lowest were in Indonesia and India.

62 See, for example, Kose et al. (2009), Balakrishnan et al. (2009), Helbling et al. (2007), and Tong and Wei (2009). There are also, of course, benefits of greater financial integration (see, for example, the surveys by Kose et al. 2009 and Obstfeld 2009 that have to be weighed against the costs). We focus here on the crisis transmission aspects because that is the main subject matter for this paper.

63 See Helbling et al. (2007).

64 As hinted at in Section 2, one important feature of this financial crisis has been the greater difficulty that banks worldwide faced in funding themselves in international markets. Banks in much of emerging Asia—and especially in China and India—were at an

advantage because they experienced strong growth in domestic bank deposits during the 2001–07 period. As such, they had less need to borrow abroad to finance the rapid expansion in domestic credit and they were less affected by the interruption to international wholesale funding markets during the crisis. Interesting enough, the BIS (2009) also found that cross-border loans seemed to have been temporarily more stable in some smaller emerging economies with a larger foreign bank presence; at the same time, they found that the record on local currency loans of foreign-owned banks was more mixed, showing resilience in some emerging economies (Brazil, China, Poland, and Turkey) during the fourth quarter of 2008, while decreasing in some others (Korea and South Africa). Indonesia and Malaysia have the most significant foreign bank presence (share of banking assets held by foreign banks with majority foreign ownership) in emerging Asia, while China, India, and the Philippines have very low foreign bank presence; see Pomerleano (2009).

65 Their small exposure to U.S. subprime assets notwithstanding, Asian economies, as emphasized by Forbes (2008), are now the largest foreign holders of U.S. financial assets. Using data compiled by Brad Setser for June 2008 covering eight Asian emerging economies and expressing holdings as a share of the Asian economy's GDP, Singapore had the largest exposure to U.S. corporate debt, followed by Malaysia. For U.S. Treasuries, Hong Kong had the largest exposure, followed by Singapore and China. For U.S. agency securities, China topped the list, followed by Malaysia. Singapore and Hong Kong had the largest exposure to U.S. equities and U.S. bonds (as a group). These Asian exposures are sizeable—in some cases reaching 15 to 60 percent of the creditor economy's GDP; see Goldstein and Xie (2009). In addition, the sovereign wealth funds of some Asian economies made significant investments in some U.S. private financial institutions—particularly during the recent period when equity prices for these U.S. financial institutions were under strong downward pressure and when the firms were seeking to rebuild their capital. We have not seen estimates of the mark-to-market losses sustained by individual emerging Asian economies on their broader exposure to U.S. financial assets. All of this suggests that losses in financial wealth in Asian emerging economies during this crisis are overwhelmingly domestic—and primarily reflect losses in stock market capitalization.

66 The qualifiers on cross-border bank borrowing—to *advanced-country banks, relative to GDP, and relative to emerging Europe*—are important; there have been large absolute increases in borrowing by Asian economies from international banks in the June 2006 to June 2008 period, as well as large corporate borrowing on international bond markets; indeed, the reversal of those excesses are part of the current financing problems in emerging Asia.

67 See the discussion in Ito (2007) and Goldstein (1998).

68 See, for example, Kaminsky et al. (2004).

69 The IMF (2009d) maintains that since inflation expectations have fallen significantly during this crisis, real interest rates have either remained relatively constant or have increased in some countries. This is part of their argument for further nominal interest rate cuts. The World Bank (2009) reports that between December 2008 and February 2009 interbank rates declined in the larger emerging Asian economies, with the notable exception of Indonesia.

70 Lardy (2009) also notes that China has been reducing required reserve ratios for banks since November 2008.

71 The IMF (2009c) offers its tally of the estimated cost of discretionary fiscal measures for 2008–10 (relative to a 2007 baseline), albeit only for G-20 countries. On that metric, China's stimulus comes in at 6.2 percent of GDP; the corresponding figures for other Asian G-20 members are: Japan (4.5 percent), Korea (6.0 percent), India (1.8 percent), and Indonesia (2.0 percent); the (PPP-weighted) average for all G-20 members was 4.1 percent.

72 The IMF (2009c) reports that for G-20 countries, almost two-thirds of the fiscal stimuli have been represented by expenditure measures, with a heavy emphasis on increased spending for infrastructure.

73 The standard equation for the change in the public debt ratio is: $D(t) - D(t - 1) = [(r - g)/(1 + g)]/D(t - 1)$, where $D(t)$ is the ratio of public debt to GDP in year t , r is the nominal interest rate, g is the nominal growth rate of GDP, and pb is the ratio of the primary fiscal balance to GDP. The debt ratio is constant when $pb = [(D/Y)(r - g)]/(1 + g)$. The equation for the change in the external debt ratio is symmetrical—but with the ratio of the (noninterest) current account balance to GDP replacing the primary fiscal balance ratio.

74 The corresponding required primary balance ratios for the United States and the United Kingdom were 3.9 and 2.6 percent, respectively. The IMF's (2009c) forecast for 2009 was that India, Indonesia, Korea, and the Philippines would run primary surpluses (of between 0.1 and 2.2 percent of GDP) in 2009, while China and Malaysia would run small primary deficits.

75 In contrast, recall that Thailand, Indonesia, and Korea all had current account deficits in the period immediately preceding the Asian financial crisis; see Goldstein (1998) and Ito (2007).

76 Turner (2009) also warns that massive accumulation of international reserves and its domestic financing counterpart have led to very rapid credit expansion which itself carries significant risks. He cautions further that excess liquidity in banks can disguise underlying problems.

77 "Stand alone" credit ratings seek to evaluate the intrinsic strength of the financial institution—without regard to the probability of government support should the institution need it.

COMMENTARY

The Impact of the Financial Crisis on Emerging Asia

Michael Mussa

Morris Goldstein and Daniel Xie provide a very comprehensive presentation and discussion on the impact of the financial crisis on emerging Asia. In order to try to add some value to this discussion, I will focus on what is primarily a single issue, though there are a number of aspects to it. Figure 1C in the Goldstein and Xie paper summarizes the main message of what I want to focus on. The figure plots annualized growth rates for exports of emerging Asian economies. Since the prices of exports, which are predominantly manufactured rather than primary products, did not have a great deal of movement during this period, the figure effectively describes real export growth. What is clear for Asia is that exports wiggled around, but essentially were flat from 2003 until late 2008, when exports collapsed.

In terms of this metric, the crisis and its impact on emerging Asia occurred mainly in late 2008 and early 2009. This was well after the financial difficulties in the subprime market in the United States that began to emerge in early 2007 deepened further in the summer of 2007 and intensified with the Bear Stearns episode in 2008. It was only beginning around the middle of September of 2008 with the demise of Lehman Brothers that the global financial crisis really stepped up in magnitude. Indeed if we look at measures like the *Vix index*, a measure of volatility in the stock market, it fluctuated between roughly 8 and 30 for a number of years and then suddenly shot up to almost 90. This unprecedented movement and changes in many other indicators of financial market stress at the end of 2008 occurred in a way that we had never seen before in the postwar era. So in discussing the effects of the global financial crisis, it makes a great deal of difference if one is talking about the effects of the crisis beginning in September 2008 or about the longer period of financial stress that began in mid-2007.

Now, we might also note that some of the other emerging market areas show a slightly different pattern in terms of exports. For Africa and the Middle East, nominal export growth rose in late 2007 and the first part of 2008 as the result of an acceleration of global inflation in commodity prices that occurred

just before the global economic collapse and intensification of the financial crisis that occurred in the latter part of 2008.

Let me discuss further the timing of the financial crisis and the timing of the impact on emerging Asia. The first key point is that, while a great deal of attention has focused on the global financial crisis, I think that to a greater extent than is widely appreciated we have seen a classic boom-and-bust cycle in the world economy, to which has been added some elements of typical financial stress, augmented by the extraordinary financial market turbulence experienced in the fall of 2008. So we need to understand the global crisis as part of a broader cyclical phenomenon.

World economic growth slowed very substantially in 2001 and 2002 and accelerated beginning in early 2003 into the 4 to 5 percent range through 2007. This first phase of the general global expansion ended around mid-2006. Note that U.S. gross domestic product (GDP) also accelerated in this period, as did GDP growth in emerging Asia and most regions of the world economy. It was a very broad-based global economic expansion, with inflation remaining generally very well subdued at least through 2006 and 2007, despite some upward movement in commodity prices. In Asia, growing exports were a very important part of the economic boom. In the United States the housing sector was booming with residential investment (having suffered no downturn in the recession of 2001) and continuing to expand rapidly through the end of 2005. Home prices escalated rapidly, reaching a peak in the middle of 2006. With U.S. domestic demand growing somewhat more rapidly than real GDP, there was a corresponding further deterioration in the U.S. current account deficit. So in phase one there was a general boom without inflation.

In phase two, the U.S. economy slowed significantly, especially in terms of domestic demand growth. Domestic demand growth from the middle of 2006 to the end of 2007 was barely more than 1 percent at an annual rate. GDP growth also slowed to a little bit more than 2 percent. Improvement in U.S. real net exports, aided by the continuing boom in the rest of the world economy, was the key reason why the U.S. did not slow more or fall into recession during this stage of the business cycle. So we see a differential movement between the U.S. and most of the rest of the world economy in this six-quarter period from mid-2006 through 2007. Emerging Asia on the whole continued to do quite well, as did Western Europe and Japan to an extent. However, global inflation began to accelerate towards the end of this period, with 12-month inflation rates picking up in most of the world economy. The U.S. was a bit of an exception because core inflation in the U.S. showed very little response to the general rise of prices elsewhere in the world economy. This difference is important in terms of the

conduct of economic policy. The Federal Reserve, concerned about both developments in the financial sector and the weakening of economic activity, started easing monetary policy in the fall of 2007. In contrast, almost all other countries around the world were either maintaining relatively firm monetary policies or tightening policies further at this stage.

Moving to phase three, during the first eight or nine months of 2008 the U.S. economy was in recession according to the National Bureau of Economic Research. Other countries generally continued to expand through the first quarter of 2008, and inflation worldwide continued to surge with the oil prices moving to new highs. However, in the second quarter of 2008, global GDP growth began to slow substantially. Most other industrial countries experienced negative growth, as did a number of emerging market countries such as Korea and Singapore. Though growth in most of emerging Asia including China remained positive, the overall global economy entered into recession by the third quarter of 2008. The United States contributed to this global recession through spillovers from its financial crisis and its domestic recession. But the global recession was also partly a result of the global tightening of monetary policy implemented to combat rapidly rising commodity price inflation earlier in 2007. In addition, the remarkable upsurge in world oil prices dramatically cut the real value of consumer income and spending power in the U.S. and many other economies.

So the deepening global economic slowdown in the first eight or nine months of 2008 was certainly not exclusively due to the financial crisis up to that point. It was also the result of cyclical events, including the upsurge in oil prices and tightening of monetary policy abroad. Then on top of it all, we added this remarkable, unprecedented collapse in the functioning of key global credit markets and economic activity around the world. This showed up in everybody's GDP growth rates in the fourth quarter of 2008, as growth rates around the world all dropped very substantially from where they had been in previous years. The global decline in real GDP by more than 6 percent at an annual rate is unprecedented in the postwar history of the world economy. So it is there where we see the impact of the global financial crisis.

This has several implications. First, what we are ultimately going to think about this crisis is probably going to have to wait until another conference to consider further because a great deal depends upon whether, as I expect, we will get a V-shaped recovery or we have a long period of very sluggish economic recovery including in the United States and most industrial countries. We just do not know the answer to that yet but it will surely influence how we think about this episode. Just as if, had we held this conference a year ago, it would have been very different from the conference we're having now because

we wouldn't have seen the economic impact of the collapse of global financial markets.

A second point is, I do not fully understand what caused the great global financial crisis of the fall of 2008. Many people say it was the failure of Lehman Brothers. But that is like saying that the assassination of the Archduke Franz Ferdinand caused the First World War. I think the current situation is more complex than that. The demise of Lehman Brothers may have been a triggering event, but it is unclear why it triggered such a remarkable collapse of market function. How and why that happened is something that requires greater explanation.

Finally, there is the question of, what should we do about all of this? I feel a little uneasy in that there are many proposals for reform and reconstruction of our financial system. Almost all of those proposals were out on the table before the Lehman Brothers collapse. So they could not have been formulated with that experience in mind. Thus the question is, how do these proposals need to be adapted in light of what we should have learned from that remarkable event. If we're talking about the economic impact on the crisis of emerging Asia, we are primarily talking about the impact of the crisis from that point onward, not the crisis before that time.

GENERAL DISCUSSION
The Impact of the Financial Crisis on Emerging Asia

Chair: Rakesh Mohan

Mr. Mohan: While people think of their questions, let me start off with one question for Morris. Given your documentation of the very large fall in GDP growth and exports from Asian countries, do we have an understanding about why banks in the region were not more affected? Given that kind of fall, one would expect greater corporate stress and therefore greater financial stress in Asian countries.

Mr. Goldstein: Well, I think you are seeing some corporate distress in Asia. The IMF, among others, has done an analysis of the current crisis and how it compares with earlier crises. I think the conclusion of this analysis is that the current crisis will be serious but not anywhere near as serious for the region as it was a decade ago.

As for the banks themselves, over the past decade you've seen big increases in capital and provisioning rates, so they are in better shape. This crisis is a lot about wholesale funding. When you're looking at differences in how different financial institutions were affected, I think one of the most helpful questions to ask is, how did they fund themselves, whether you're talking about institutions within the United States or you're talking about the impact on a cross-country basis? When you're getting very large deposit growth, you don't have to depend as much on wholesale financing. The institutions that did depend a lot on wholesale financing and that were, in particular, very dependent on bank lending seem to have suffered the most. In contrast, Asia, at least the larger economies in the region, had more robust bank deposit growth and suffered relatively less.

Mr. Hooper: I'd like to address the issue that Mike Mussa was wrestling with in his discussant comments. What was it that caused the massive drop in trade affecting Asia in the fourth quarter of 2008, and to what extent do we attribute the trade drop to the Lehman Brothers collapse in September 2008? I think the huge drop that came has to have been related importantly to what happened to global inventories. There was a huge buildup of inventories in the second and third quarters as U.S. consumer spending on durables fell ahead of Lehman.

I think the bottom in durable spending came not long after the Lehman collapse. This inventory buildup led to a massive liquidation affecting trade globally. So, yes, the financial crisis and the availability of credit obviously is a key factor, but I think we may be overstating the case. The rapidity with which this downturn came is something that, as Mike suggests, may have been pretty much baked in the cake because of the massive inventory correction that took place.

Mr. Mohan: Do you want to take a couple of questions?

Mr. Bery: Two questions for Mike Mussa, just to pursue the interesting points you've made. The first is, do you think we're declaring victory too quickly for Asia? As Rakesh just mentioned if, indeed, the downturn is post-Lehman then the impact on financial systems may still lie ahead. Or do you have reasons for thinking that the financial systems are sufficiently robust that there won't be a second round? And secondly, I wasn't sure where you were on the tightening of monetary policy in response to the commodity price shock. Rakesh [as Deputy Governor of the Reserve Bank of India] was, of course, in the hot seat at that time. I was on the Indian Monetary Committee and there was a lot of advice coming from the Asian Development Bank, and to my knowledge even from the IMF, that the right response in order to anchor inflationary expectations was to tighten. So in hindsight, was that bad advice?

Mr. Kashyap: Morris, I want to pick up on your point about bank lending. It seems to me that the numbers for the condition of banks in China don't add up. If you just look at loan growth, who it's going to, and the relative performance of the SOEs (state-owned enterprises) in China during all of this, it seems to me that they've got a huge raft of bad loans that are just kind of like the check is in the mail and it hasn't been cashed yet. I wonder if you have any reason to believe otherwise. I'm not saying that this is necessarily a bad thing. Maybe it's a reasonable way to run your unemployment policy if you don't have a full social safety net. But I'd like to know whether you think there's any evidence against that view?

Mr. Mohan: We'll take responses after this and then take a next round of questions.

Mr. Eichengreen: Peter Hooper anticipated my point, but I'll restate it anyway. I think we can all agree that it was primarily the collapse of exports that was the driver in the crisis in Asia, but we still don't agree about what caused the collapse of trade. So, are we simply in a world where inventory management has changed, and when there are serious downturns there will be more serious

inventory corrections? Or is it something distinct from inventories about the articulation of global supply chains? Or was it the interruption of trade credit for which there is relatively little systematic evidence, or was it something else? I think we still don't know.

Mr. Xie: Thanks for the questions. I want to answer the last question. I think there's emerging evidence that shows that global vertical integration and the global supply chain is contributing to global business cycle synchronization, especially in the case of Asia. So, even though Asian countries have very high levels of intraregional trade, they were not shielded from the trade drop with countries outside the region.

Mr. Goldstein: I'll respond first to Anil's question about Chinese banks. We have seen extraordinary loan growth. There's a good side and a bad side to that. The good side is that in China you can tell the banks to step up lending and they do it quickly. So, it's not like in the U.S., where loan growth has been flat or going down. In China, you tell them and bang, you get loan growth up to 35 percent in the first six or eight months, and that helps. It's like a stimulus.

As to whether that's going to come back to haunt them, I think it's not clear. I put quite a bit of weight in the views of my colleague, Nick Lardy, who watches those numbers from month to month. Quite a lot of the new loans have been directed to infrastructure, which is essentially backed by the government; not as much has gone to property lending and the like. And they have shown in the past that when you think lending growth is really going off the rails they are able to bring it back. So if loan growth keeps up at anything like the current pace, I worry a lot about the future cost of that in terms of nonperforming loans. But I think it depends on what happens in the next four or five months. If they get it back down to what is a reasonable rate for them, it may not be too bad.

On the export side, what we do know about is the product mix. If you're exporting cars and people cannot get car loans, it affects your exports, whether you're Germany or whoever you are. I bow to Peter Hooper's much more detailed knowledge about the U.S. economy and what was happening with inventories and the like. So, it's likely to be a bunch of things. I've seen differing reports on trade credit, as I think Barry has, with some people saying it's been a big factor and other people saying not. I'd also direct your attention to a chart on net exports in our paper that shows you the contribution of net exports to GDP growth in emerging Asia over the 2000 to 2008 period. For the nine economies we have, the median contribution is only about 11 percent; most of the growth has been coming from domestic sources. So although there have been periods, for example, in China where net exports accounted for 20, 25, 30 percent

of growth, for most of the period as a whole the contribution is 10 percent, 11 percent. Indeed, of the economies that we compare, the one that's most export-led, by far, is Germany.

This feeds back on the rebalancing issue. If you're going to rebalance growth in China, a lot of it is going to come from a shuffling in the components of domestic spending; that is, by bringing investment down or bringing consumption up. You can get net exports down, but that is not really what's driving growth most of the time in those countries. It's investment.

Let me just say on Mike's comments, I find them very useful and I think they are a very helpful complement to our paper. We looked at what was different in emerging Asia, particularly compared to other emerging market groups. I think what Mike's comments bring out is that the timing is very important in understanding the cross-country spread of the crisis. You can see a lot if you break it up quarter by quarter. Some of the studies that attempt to measure the independent effect of spillover take some of that into account by putting on the right-hand side global commodity prices and other things, but they don't really capture it in the way that Mike was describing it.

Mr. Mohan: Mike, I think he wanted you to respond.

Mr. Mussa: I have a couple of things to say about the role of trade and inventories as well as the role of the financial crisis. It may be that the move to recession already in the second and third quarters of 2008, before the intensification of the financial crisis after Lehman Brothers, was not fully reflected yet in a slowdown in output as inventories built up. I think the recession would have continued in the fourth quarter and perhaps even deepened somewhat, even if we had not had the remarkable financial crisis. But the financial crisis undoubtedly mattered a great deal.

Whenever I consider modeling this, I think of Adam Smith, who described the economy as functioning through the great wheel of circulation whereby credit and money flow through the economic system. Normally, we don't pay very much attention to that since, as Irving Fischer put it, "money matters only when it's out of order." But when even the prime borrowers in an economic system, such as the General Electrics, that regularly rolled over their commercial paper, can no longer do that and cannot get the credit necessary to meet their payrolls and pay their dividends, or they feel threatened that such circumstances will soon befall them, the great wheel of circulation begins to grind to a halt and with it much of economic activity. I think there's no doubt that is the type of process we were getting into a little bit more than a year ago. And if the

monetary authorities and fiscal authorities had not imposed the effective equivalent of defibrillation on the credit system, we would have been in much deeper trouble.

So, I take the point that probably the recession would have continued and deepened even without the Lehman Brother collapse. But there is no doubt, given the magnitude and the speed of the response of the real economy, that the disruption of the function of the fundamental mechanisms of credit circulation played an important part. Was the response of monetary policy to rising inflation appropriate? Well, monetary policy, like all policy, is made in real time, and you need to respond to the information that is available.

Now some will say that they anticipated the great financial crisis of the fall of 2008. I think that's complete nonsense. That's not an event which is possible to anticipate. It suddenly arises. There is a panic. You can know perhaps that vulnerability to such a panic has escalated as the economy has weakened and as the financial sector has weakened, but being able to predict that you're actually going to get an event of that magnitude, I think, is beyond our capacity. Just as we know at some point that there's going to be a big earthquake in this area of California, but we don't know when it will occur. I think it's a similar problem in the financial sector: you can know vulnerability is high, but it's very difficult to forecast a crisis in advance. If the monetary authorities had ignored the upsurge of inflation, the consequence might well have been not only more inflation, but we would have gotten the same crisis a little later.

Mr. Mohan: Thank you, Michael, for defending the actions of monetary authorities in early 2008 and the increasing of interest rates in response to inflation. We have time for two or three more questions depending on their length.

Mr. Kohns: Could you elaborate a bit on your estimate of the impact of the crisis on potential output in Asia? You said a lot about the origin of the crisis and that overcapacities will build up, so we might see long-term declines in output levels. But what will be the impact on growth rates? You said that it might be necessary for countries in Asia to promote domestic demand in order to maintain growth rates? Some remarks on that would be very helpful.

Mr. Mohan: David Hale.

Mr. Hale: Question. The consumption shares of GDP in Asia are very diverse compared to the rest of the world. The highest in the world was the Philippines at 74 percent, higher than the United States. China was at 36 percent. Most countries are clustered in the range of 50 to 60 percent. The policy response

to the crisis over the last year has involved a lot of fiscal stimulus in Malaysia, Thailand, Singapore, and so on. Do you see any hope, looking out two to three years, that the consumption share of GDP in these countries will rise, thereby contributing to the reduction of global imbalances?

Mr. Mohan: I think we'll have to keep that as the last question.

Mr. Xie: I will try to answer the last question. Most of the rebound in Asia since the crisis has been due to direct fiscal stimulus. I think that greater domestic demand in Asian countries could be helpful both to boosting growth and also decreasing global trade imbalances. But probably any such rebalancing will take some time to achieve.

Mr. Goldstein: Just briefly, maybe I can combine the two questions a bit. The fact that the consumption share is so low in parts of Asia has the upside that it can go up a lot. If you look at what's happened over the past couple of years, for example in China, there have been very big increases in fiscal spending on the social safety net. Also if China allows more exchange rate flexibility and appreciation of the renminbi then it could do more with interest rate policy to stimulate domestic demand. So, there is quite a bit of potential to rebalance the sources of growth without a huge decline in China's overall growth rate. But China would have to be convinced that was in its interest to allow significantly more appreciation than in the past, and I'm not so persuaded that this crisis is going to do it. Particularly as China comes out of the recovery, people will say that it was a terrible shock, but it's over, so let's go back to where things were. We've seen the renminbi has been pretty flat now for 14 months in real effective terms—I think it's going to be an uphill battle to have more than small future upward movements in the currency.

Mr. Mohan: Michael, last word.

Mr. Mussa: I believe Asians can and will consume more. We saw five or six years ago when the Koreans liberalized credit card availability there was a big explosion of consumer demand in Korea. In fact, it was too big. In China, I think an important part of the problem is that Chinese government policy has really repressed household income, forced people, in effect, to accumulate money balances through the accumulation of foreign exchange reserves rather than the central bank printing money domestically. That has had an important depressive effect on household income and held down the growth of consumer spending. So, I'm not pessimistic that we will see a substantial increase in consumption in China in the future.

Also keep in mind, the U.S. saving rate will probably go up. Recently it's been running 4 or 5 percent. I think it's probably going to go up to 6 or 7 percent. The U.S. is 20, 25 percent of the world economy. So, to get an offsetting reduction in saving in the rest of the world requires their saving rate to come down 1 percentage point or less. I think that that's within the range of what's achievable.

Mr. Mohan: Thank you very much to Morris, Daniel Xie, and Michael Mussa.

Lessons from Asian Financial Experience

Anne O. Krueger

1. Introduction

Until the 1990s, East Asia's economic growth was the economic marvel of the world in the post-World War II period. Japan, a low-income country prior to the war, had emerged from it in dire economic straits, but postwar reconstruction was completed by the mid-1950s and economic growth accelerated sharply in the late 1950s. By the mid-1960s, Japan's "economic miracle" had transformed it into an industrial country whose economy and productivity bore no resemblance to that of the late 1940s, as signified by its joining the Organisation for Economic Co-operation and Development (OECD) in 1964.

In the immediate postwar period, the rest of East Asia was even poorer than Japan. Korea was partitioned in 1946. What became South Korea¹ endured the partition, and experienced hyperinflation in the late 1940s and war on its territory in the early 1950s. In the aftermath of the war, Korea had one of the lowest per capita incomes in Asia, the highest density of population on the land of any country in the world, and population characteristics (life expectancy, literacy, infant mortality) found only in very low-income countries.² Although reconstruction usually enables an above-average rate of economic growth for at least a few years, Korea's postwar economic growth rate remained below 5 percent (with per capita income growth at less than 3 percent).

Taiwan experienced a large immigration in the aftermath of the Chinese civil war, and was also very poor, although significantly better off in terms of per capita incomes and other measures of well-being than Korea. The two city states, Hong Kong and Singapore, were likewise poor. Southeast Asian countries had higher per capita incomes than their East Asian neighbors, but were also "underdeveloped countries," the term used at the time, by any measure.

But starting in the mid-1950s in Taiwan, in the early 1960s in Korea and the city-states, and in the 1970s in Thailand, Malaysia, and Indonesia, economic

Author's note: *I am indebted to Takatoshi Ito, Il Sakong, and Andrew Sheng for helpful comments on the penultimate draft of this paper, and to Erin Berg for research assistance. None of these are responsible for the views expressed herein.*

growth accelerated rapidly.³ By the late 1980s, Japan's economic prowess as a high-income industrial country was recognized globally. The four "Asian tigers" (Hong Kong, Singapore, South Korea, and Taiwan), as they came to be called, had sustained unheard-of rapid growth rates, even higher than Japan's, and become industrial countries. The Southeast Asian countries were also growing rapidly, although not quite at the pace of Japan and the "tigers." Many observers believed that all these economies were immune to the difficulties faced by countries in the rest of the world, as they weathered almost without notice the 1973 oil price shock, the second oil shock, the "debt crisis" of the early 1980s, and other challenges that affected almost all other economies negatively.⁴

But in the 1990s, when it was believed that the success of these economies was entrenched, things changed dramatically. In 1990, Japan entered into a period of stagnation more than a decade long, often referred to as the "Great Stagnation" (Hutchison, Ito, and Westermann 2006). In the late 1990s, Thailand, Malaysia, Indonesia, and South Korea all experienced severe crises, and a number of the other successful Asian economies were severely challenged. In many ways, the Japanese stagnation and the Asian financial crises were as surprising to the world in the 1990s as the financial crisis in the United States has been over the past two years.

It is the purpose of this paper to examine the factors contributing to the difficulties in these economies in the 1990s and to analyze the policies that were adopted in addressing them. Focus is on Japan and South Korea as their experiences largely capture the lessons to be learned. When experience from other countries is relevant, or significantly different from that of Japan and South Korea, that will be noted.

A first set of lessons focuses on the rapid growth leading up to crisis and the importance of a well-functioning financial system for growth. A second set of lessons is relevant mainly for developing countries and emerging markets, and is addressed next. The third set, primarily from Japan and Korea, concerns the financial sector. Finally, crisis and post-crisis management issues are addressed.

A significant difference that sets Japan, on the one hand, and the other crisis countries, on the other, apart has to do with their economies' exposure to foreign exchange risk. In the Japanese case, Japan was incurring current account surpluses and held ample foreign exchange reserves; the difficulties were, in that sense, purely "domestic." For the other "crisis" countries, mismatches in the foreign currency composition of assets and liabilities in the financial system were major immediate triggers of the crises, although they led to problems in the financial sector that were much the same as those of Japan.

2. Lessons for Emerging Markets and Developing Countries

The Asian crisis countries other than Japan all faced problems in their banking systems, but to a considerable extent the origins of the emerging markets' banking systems problems differed. In many regards, as already mentioned, the Korean experience typifies the lessons from the East Asian emerging markets that went into crisis. Some, such as Taiwan, Singapore, and Hong Kong, were severely threatened, but managed to avoid a full-blown crisis either through the use of (a high initial level of) reserves or through other interventions.⁵ From these experiences in the 1990s, there is widespread consensus on several lessons, although most are relevant primarily for emerging markets and of limited relevance for the major industrial countries. However, they do apply to a significant degree to the economies of Eastern Europe in the current setting.⁶

Lessons include the wisdom of choosing an exchange rate regime consistent with the use of other policy instruments, which in most cases is a flexible rate regime;⁷ the need to avoid mismatches between banking assets and liabilities that can result because banking assets are denominated in domestic currency while liabilities are denominated in foreign currency; and the desirability of a ratio at least above one between government holdings of foreign exchange reserves and short-term liabilities.

Turning first to the exchange rate issue, there is an almost universal consensus that, in the absence of a willingness and ability to adjust domestic monetary and fiscal policies to the dictates of the balance of payments under a fixed exchange rate regime, a floating exchange rate regime serves as a preferred buffer for individual countries.⁸

Ito (2007) believes that the maintenance pre-crisis of fixed exchange rates was a crucial mistake: "For emerging market countries . . . the danger of a de facto dollar peg was again confirmed. The de facto dollar peg may result in an overvalued real exchange rate if the domestic inflation rate is higher...than the U.S. rate. The de facto dollar peg encouraged borrowers and lenders to engage in financial transactions that underestimated exchange rate risk" (p. 26).⁹

Prior to the 1997 crises, Thailand and Malaysia had supported almost entirely fixed exchange rates for several decades, while Indonesia and Korea had permitted only limited managed floating. In consequence, earlier adjustments that might have removed some of the pressure from those countries in 1997 were not made, and the swings in exchange rates that accompanied the onsets of the crisis (when countries could no longer defend their rates) were commensurately larger and resulted in much larger shocks to the domestic economy. The price of a dollar almost doubled in Korea, for example. But the biggest

change was in Indonesia, where the pre-crisis exchange rate was 2380 rupiahs per U.S. dollar at the end of 1996 and peaked during the crisis at over 17,000 rupiahs per U.S. dollar, falling back to between 9,000 and 10,000 by 2000–01.

In analyzing the Asian financial crises, IMF researchers have concluded that when a flexible exchange rate facilitated the needed external adjustment in the 1990s, the response to policy changes was accompanied by larger output gains than under fixed exchange rates (Ghosh et al. 2005, pp. 107ff).¹⁰ But there are other reasons why a flexible exchange rate is probably preferable. When exchange rates are fixed (or heavily managed), expectations form that the exchange rate will stay within a relatively small range, and the temptation not to hedge foreign currency borrowing is strong. Insofar as uncovered dollar liabilities in the banking system (or of banks' borrowers) are larger under fixed exchange rates, the shock to the system when the exchange rate is forced to change is larger.¹¹

The danger of mismatches between currency denominations of assets and liabilities is clear. The difficulty, as perceived by many policymakers in emerging markets, has been that foreign loans have been available largely, if not exclusively, in foreign currency. The result has been that changes in the exchange rate have resulted in increased liabilities of the banking system (and the banks' borrowers) with little change in bank assets, since they are mostly denominated in local currency.¹²

A strong lesson from Asia in the late 1990s is the importance of insuring that banks' assets and liabilities are either in the same currency or appropriately hedged.¹³ Another advantage of a floating exchange rate regime is that borrowers and lenders are more aware of the possibility of exchange rate fluctuations than they are under fixed exchange rate regimes.

The final macroeconomic lesson, important for emerging markets and low-income countries but less relevant for industrial countries, is the desirability of maintaining sufficient foreign exchange reserves to be able to cover short-term foreign exchange liabilities.¹⁴ Speculation against a currency is considerably less likely when speculators can observe that foreign exchange cover may be adequate to withstand an attack.¹⁵

3. Lessons from Growth

Prior to considering the lessons of relevance to industrial countries from the Asian crises, it is useful to sketch some of the characteristics of the growth experience of those countries, especially as they relate to the financial sector. This is important because it is sometimes thought that financial crises prove that the financial sector does not contribute to economic growth. But nothing

could be further from the truth. Financial development is an essential concomitant of economic growth. While the crises were painful, they took place when they did because of failures of the financial and real components of the growing economies to develop synchronously.

All but the most primitive economies must have a financial sector. Even at very early stages of development, when 70 to 80 percent of economic activity is still in agriculture and other subsistence activities, the absence of a well-functioning financial sector suppresses economic activity somewhat (as most nonfarm activities are family owned and family financed) but is not a major deterrent to more rapid growth because activities of a size and a character to require finance are such a small part of the overall economy.

But with economic growth, the costs of financial “repression” (to use McKinnon’s (1973) apt term) rise. Indeed, if a relatively efficient low-cost banking system does not develop, possibilities for growth are limited. But when there are only a few “nontraditional” nonagricultural activities—often textiles and clothing, footwear, and the like—a banking system of even relatively small size can enable a small nontraditional sector to function and grow, and it can be reasonably evident (as it was in Korea in the 1960s) which activities (unskilled labor-intensive exports in Korea’s case) should be financed.

But to move beyond the constraints of family finance requires the ability of promising enterprises to finance investments in addition to those that can be undertaken with plowed-back profits (and mechanisms for assuring owners of low-return or loss-making enterprises that they can invest in businesses other than their own with reasonable confidence that they will be fairly dealt with).

The history of economic growth of the West is one in which new financial innovations came about to meet the increasingly complex financing needs of the growing modern sector.¹⁶ Since new activities must be financed and inherently involve uncertainty, the financial sector plays a crucial role for economic growth in appropriately assessing risk-return trade-offs and channeling funds to those investments that are most promising. It is no coincidence that the World Bank has repeatedly found that countries with deeper and better functioning financial markets are countries with higher per capita incomes.¹⁷ Interestingly, in rich countries credit to the private sector averages 71 percent of GDP, while in low-income countries it averages 47 percent, and in the very poorest, 13 percent. Other measures of financial depth show similar patterns.

3.1. The Korean Experience

That lesson is highly relevant to understanding the Asian experience in the 1990s. The Korean experience illustrates. Korea had a very underdeveloped

financial system in the 1950s. Although some policy reforms started in 1958, the commitment to an outer-oriented strategy and wholesale reform really began in the early 1960s. Economic growth accelerated sharply, and growth momentum was sustained for the next three-and-a-half decades, as many reforms in the fiscal system, in government regulations, in the trade regime, and elsewhere were undertaken.

However, there was little effort to develop the financial system. Instead, the government mandated credit allocation with credit rationing (directed credit). Exporters were entitled to a specified amount of credit at a subsidized interest rate per dollar of exports,¹⁸ and other activities deemed socially desirable were also eligible for subsidized credits. Other entities either managed on self-finance or went to the (thriving) curb market where interest rates were much higher.

While there were undoubtedly inefficiencies in credit allocation, two considerations suggest that these were limited. First, Korea had entered the 1960s with exports equal to approximately 3 percent of GDP and imports equal to 13 percent. Foreign exchange was rationed, and there was a significant black market premium despite high tariff levels and import licensing. To allocate most new resources to exportable industries undoubtedly made sense, and the fact that borrowers had to export successfully in return for their credit meant that there was something of a market test to sort out potential borrowers. Second, given Korea's very high growth rates in the 1960s, it is difficult to argue that improved credit allocation could have made the growth rate very much higher.

Partly because of credit rationing, and partly for other reasons, much of the initial growth in Korea was concentrated in the *chaebol*—the industrial houses that grew very rapidly in response to the incentives offered by the government. The *chaebol* naturally established or acquired their own merchant banks (and some small commercial banks) and lent to the various companies within their specific groups. The larger commercial banks also bought *chaebol* debt.

Over time, the hugely profitable opportunities for expansion for the *chaebol* diminished, but they were still large and visible and subject to special regulations. They had been prohibited from laying off any workers and had thus expanded into new activities as productivity rose (or, in the case of some very labor-intensive industries, exports were no longer profitable). Over time, as each *chaebol* ventured into more and more new lines of activity, managerial challenges undoubtedly became increasingly difficult and the requirement that they retain all workers more onerous. At much the same time in the mid-1980s, the government was attempting to liberalize the financial system. The banks

lent (or rolled over loans) to their less profitable businesses to keep them afloat as profitability fell. For the chaebol, mechanisms for increasing profitability such as reducing the workforce were unavailable to them.

One question might be why Korea ran into difficulties in 1997. But another, more fundamental question is how the authorities managed macroeconomic and financial policies so well that there were more than 30 years of growth before the first crisis. The first oil price increase, in 1973–74, hit South Korea particularly hard because of the total dependence on imported oil.¹⁹ But the authorities adjusted policies, passing on the oil price increases and raising taxes so that growth quickly resumed.

During the early 1970s, the government had also decided to embark on a heavy and chemicals industry (HCI) program, believing that Korea's rapid economic growth warranted that decision. In fact, the HCI drive resulted in sharp changes in the economy, tripling the compensation of engineers, leading to the first decline in exports (in an export growth-led economy) since 1960, and generating inflationary pressure. But before the harm could extend too far (and before the second oil price increase, which probably would have been disastrous had policies not been altered), the mistake was recognized, and the HCI drive was greatly curtailed, if not abandoned. The second oil price increase and the worldwide recession that followed it also posed a challenge for Korean economic growth, but, as in earlier instances, the authorities were able to adjust so that Korean growth in fact accelerated.

Over the 30 years prior to the 1990s, many fundamental policy adjustments had been made. The rapid growth era started with (uniform) export incentives for exporters, consisting of access to credit (which, as already seen, was provided at below-market interest rates), tax credits, and other privileges. Over the next ten years, these "incentives" were gradually phased out, while simultaneously import protection was reduced, as the exchange rate depreciated and replaced both incentives and tariffs. Likewise, fiscal reforms were undertaken, the nominal interest rate was raised (although it remained below market clearing levels) so that the real interest rate was at least not negative, and tariffs on imports were reduced and the trade regime liberalized.²⁰ The authorities successfully addressed these bottlenecks.

Korean policymakers had identified and corrected many potential bottlenecks and crisis points that would otherwise have put downward pressure on the growth rate over the 30-year period of rapid growth. Some of the challenges came from the world economy, but many were needed to address the archaic policies that had done little damage to a stagnant economy but which

were incompatible with Korea's increasingly complex modern economy. However, the domestic financial system was not sufficiently altered to keep pace with the changing economy. Suppression of bank interest rates in the early 1990s as growth seemed to be slowing, which in turn induced the banks to lend offshore at higher interest rates, and other measures, retarded the development of the financial system.

For present purposes, the important points are two. First, the financial system, and government policies toward it, must adapt and be able to handle the increasing demands put upon it as economic growth progresses.²¹ The same (flawed) financial system which had been able to support rapid growth in the 1960s and early 1970s could no longer do so as the economy modernized and become increasingly complex.

Second, even if a financial crisis is a cost of rapid economic growth, most observers would conclude that it was a cost worth paying, judging by the differences in growth rates between the rapidly growing countries and the others. If one thinks of the financial crises in the now-industrial countries in the 19th and early 20th centuries, it is more likely we should regard Korean policy choices during the decades of rapid growth (during which Korea grew more in a decade than Britain did in the entire 19th century) as having been appropriate. Failure to let the financial system develop more was the first major (and insufficiently addressed) policy issue that led to crisis. To be sure, lessons have been learned so that, in the future, policymakers in countries undergoing rapid growth will be able to reduce the severity, if not prevent, crises.

But proposals for altered and intensified regulation of the financial system must be evaluated not only in terms of the likelihood that they will prevent or reduce the severity of financial crises but also in terms of the likely effects of those regulations on the financial system's capacity to support future economic growth.

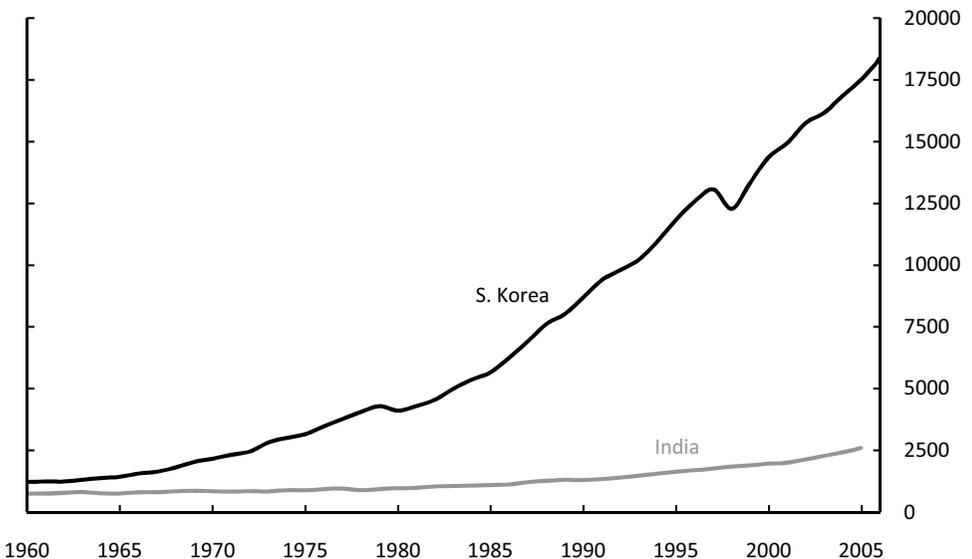
3.2. The Japanese Experience

The Japanese story is also one where successful growth preceded the stagnation of the 1990s but it differs in that a financial crisis was triggered by domestic events without any foreign currency mismatches or related foreign exchange crisis. In Japan's case, rapid economic growth had resulted in a bubble in the real estate market. The "main bank" system meant that banks lent to other companies within the same keiretsu (but to other companies outside the group as well), so connected lending was a problem. In addition, the banks held equity, real estate, and commercial loans. When the bubble burst, bank equity was greatly reduced as real estate prices and equity prices fell. Simultaneously,

many of their borrowers had borrowed to finance equity and real estate investments, and nonperforming loans (NPLs) began increasing rapidly. In Japan's case, however, there was a current account surplus and a relatively freely floating exchange rate. The result was a decade of stagnation, with an unresolved financial crisis throughout the decade despite repeated efforts to stimulate the economy. I return to the lessons from that below.

A fundamental lesson from the Asian experience in the decades after 1960 is the power of economic growth. Some countries set their economic policies for rapid economic growth, while others were far more cautious. Even if financial crises were an inevitable cost of economic growth,²² the Asian experience suggests that rapid growth is worth it. Graph 1 charts Indian and Korean per capita incomes after 1960, when their per capita incomes were fairly similar. The most dramatic feature of the chart is the much more rapid rate of growth of Korea than of India until the 1990s. But what is hardly noticeable is the crisis and the drop in South Korea's income in the 1990s. India, of course, had no financial crisis in 1997 (although there had been a balance-of-payments crisis in 1991).

GRAPH 1
Indian and Korean Per Capita Incomes, 1960–2006
 Per Capita GDP in 1990 International Geary-Khamis dollars



Source: Maddison (2003)

4. Events Leading to Crisis in Korea

As already seen, despite their many reforms in other sectors of the economy, the Korean authorities did little to modernize the financial system once they had taken measures to assure a positive real interest rate. The lending to the chaebol, and the use of the banks' lending rate as an instrument of growth policy, continued. Failure to develop a more flexible financial system commensurate with the growing economy's needs was a major factor contributing to the 1997–98 crisis.

Despite that failure, Korea liberalized short-term capital transactions as one of the measures needed to join the OECD in the early 1990s. It is often asserted that it was premature external liberalization that caused the crisis. In fact, the falling returns on assets and returns on equity of the banks suggest that the causes were deeper than capital account liberalization, although the presence of significant offshore deposits and buildup of short-term foreign debt certainly contributed to the severity of the crisis (see Kim 2006 for a full description). It is clear that the sequence of capital account liberalization was a mistake and exacerbated the 1997 crisis: long-term capital flows should surely have been liberalized sooner.

As the chaebol expanded into ever more lines of activity, their profitability fell and loans were “evergreened.”²³ The rate of return on bank assets and equity began falling in the early 1990s. No longer could an economy as developed as Korea had then become grow with such a constrained financial system.²⁴ In an effort to sustain growth, the Korean government mandated a sharp drop in interest rates, but nonetheless the return on assets continued falling and evergreening (lending so that borrowers could meet their debt service obligations) was increased. Indeed, by 1997 the return on bank assets had turned negative.²⁵

To finance themselves, the banks (and others more generally) increased borrowing domestically and placed the proceeds offshore, especially in countries such as Thailand and Indonesia where they hoped to earn a higher return. This was easy because of the liberalization of short-term capital flows, as already noted.

After the early 1960s, the exchange rate had no longer been fixed, but there was a managed float. By the early 1990s, there was strong market pressure for exchange rate depreciation. However, the authorities resisted, permitting a series of relatively small depreciations, but preventing a market outcome. During that period the U.S. dollar was depreciating against the yen, and the depreciation of the won relative to the dollar was much smaller, so that the won

appreciated relative to the yen. That reduced export profitability (both directly and because many Japanese and Korean exports were competitive, which gave the Japanese an advantage). It is generally agreed that the effort to manage the won's float intensified the Korean crisis (Kim 2006, p. 7).

Without recounting all the gruesome details, the downward pressure on the growth rate was not reversed²⁶ and the authorities responded by encouraging credit expansion and foreign borrowing (mostly short term). To add to the problems, the government of President Kim Dae Jung had changed finance ministers and ministers of economy frequently, the fifth change in his five-year term coming in March 1997 (despite the fact that a new government was to be formed in 1998 after elections in December 1997). The lack of continuity contributed to unease in Korea. Foreign debt was increasing rapidly (rising from 13 percent of GDP in 1990 to 32 percent in 1996), and short-term debt rose from 45 percent of the total to 64 percent of the total over the same period.²⁷

As already mentioned, the rate of return on bank assets turned negative, and failures of chaebol further contributed to a sense of panic. Hanbo Steel had gone bankrupt on January 23, 1997, while Sammi Group went bankrupt in March. Spreads between Korean bonds and U.S. Treasuries were rising, from 49 basis points in January to 67 basis points in March, to 87 basis points in July, to 220 basis points by the end of October (as Moody's downgraded the credit rating of the Industrial Bank of Korea), and 559 basis points on December 12, 1997 (having risen from 253 basis points on December 4, the date on which the International Monetary Fund (IMF) announced a US\$55 billion program).

By the fall of 1997, many of the offshore accounts held by banks had lost value, if not become worthless, while foreigners and Koreans alike were trying to get their funds out of Korea and the crisis became full-blown.²⁸

By the beginning of December, gross reserves were quickly nearing zero, and the Korean authorities approached the IMF (after a period during which all three presidential candidates said they would never do so).²⁹ Korean chaebol had become significantly overleveraged, with many having debt-to-equity ratios well above five. That many banks had borrowed in foreign currency and lent in Korean won made matters worse.³⁰ When the won was finally allowed to depreciate, more borrowers were unable to service their debts, and rescuing the banks became a major part of the reform package needed to stabilize the economy and improve growth prospects.

Once in crisis, however, the South Korean authorities acted forcefully. Accepting an IMF program, NPLs were rapidly transferred to asset management companies, and chaebol deleveraged. Interconnected lending was prohibited, and financial regulation reformed.

In South Korea's case, real GDP fell by 6.7 percent for the full year 1998, but began recovering in the middle of the year. In 1999, real GDP growth was about 10 percent so that economic activity had reattained its pre-crisis level. Growth continued in subsequent years. Hence, while the crisis was costly, the willingness of the government to address problems in the financial sector (and the chaebol) promptly enabled a sharp recovery and resumption of growth.³¹

5. Lessons for the Financial Sector from Japan (and Korea)

As already indicated, by the 1980s, Japan had long since joined the group of advanced industrial countries, after three decades of economic success and rapid growth.³² During that decade, real estate and other asset prices had risen rapidly. At one point in the late 1980s, the market-based value of Japan's real estate was reported to be greater than that of all American real estate! Price-earnings ratios in the stock market had been rising almost continuously during the period of rapid growth. Capital account liberalization in the first half of the 1980s, which had been expected to lead to capital outflows, in fact was followed by capital inflows so that the yen appreciated, obscuring some of what might have been inflationary pressure on goods prices in addition to the bubble.

By the early 1990s, however, real estate and other asset prices started plummeting. Economic activity slowed, and bank assets, which included real estate and equity as well as other loans, fell. Throughout the 1990s, efforts to stimulate the economy were undertaken. Economic policy in Japan in the 1990s seems to have been predicated on the assumption that a resumption of economic growth would take place and that in itself would enable debtors to resume servicing their debts to the banks. Neither resumed economic growth nor a sufficient reduction in NPLs happened.³³

There were repeated stimulus packages, and some stimulus was clearly necessary.³⁴ But in large part, the government's policy toward the banks (where there was clearly inadequate equity) was one of forbearance, except in the cases of clearly insolvent institutions. Until 1997, this period was characterized primarily by stagnation and relative monetary ease, although 1996 saw growth of over 5 percent following a large fiscal stimulus package in 1994. But despite several (relatively small) programs to help the banks, nonperforming loans on the banks' books continued to increase.³⁵

After November 1997, Japan entered into a crisis phase for the following 16 months. Credit became tight. Recapitalization of the banks, with ¥8.7 trillion (about 1 percent of total bank assets at the time), was undertaken in 1998, but that seems to have been far below the amounts needed for adequate recapitalization. The banks were again recapitalized in March 1999 and credit flows

resumed, but many of those flows were directed toward enterprises that were themselves in difficulty, often at the direction of the government.

Hoshi and Kashyap (2009, p. 29) estimate that between 1992 and 2005, the Japanese banks wrote off about ¥96 trillion of loans, or about 19 percent of GDP, and that efforts to fund the banks fell far short of needed magnitudes. While there was some recovery early in 2000, and the Japanese government's position was that the 1999 measures would jump-start the economy, stagnation once again set in and NPLs began increasing again, with capital erosion following. Hoshi and Kashyap (2009) show that, whereas NPLs resulting from the 1980s bubble were mostly removed from the banks' books by 2000, difficulties in small and medium enterprises (SMEs) starting at that same time resulted in rising NPLs once again. In the boom of the late 1980s, lending to these SMEs had accelerated, and as deflation and stagnation continued, more and more SMEs were unable to service their debts, thus giving rise to a new spate of NPLs.

The Financial Services Agency (FSA) was established in 1998, and two large banks were resolved in that year. That was an important milestone in the restructuring of the banks. But it was not until 2003 that the new FSA seems to have been able to insist upon the banks' write-offs of NPLs and recapitalization. Thereafter, the NPL problem diminished, and by 1995 it is estimated that credit flows had resumed. The evergreening of loans by the banks kept loss-making companies alive but simultaneously reduced the supply of credit for new firms (Caballero, Hoshi, and Kashyap 2008). Hoshi and Kashyap (2009, p. 21) conclude,

The main cost of allowing the banks to operate with a capital shortage was not a prolonged credit crunch. Rather the undercapitalization limited the banks' willingness to recognize losses and they took extraordinary steps to cover up their condition and in doing so retarded growth in Japan.

For present purposes of understanding lessons, probably the most important features of ultimately successful policies were the establishment of asset management corporations (which took toxic assets off the balance sheets of the banks) and the nationalization and restructuring of large failed banks.³⁶

A major lesson from the contrast in the Korean and Japanese experiences comes from the speed and determination with which the authorities addressed issues in the financial sector. In the Korean case, a "bad bank," the Korean Asset Management Corporation, was created to assume the toxic assets in the banking system, chaebol were required to deleverage and separate their banking activities from their production activities. By contrast, in Japan, until 2003 the authorities' measures were largely of the "too little, too late" variety.³⁷

Some observers have noted that a significant contrast between the rapid Korean action and the tardy Japanese response was the result of the perceived source of the difficulties. Whereas the Korean authorities were virtually forced by their foreign obligations to react speedily, the fact that the Japanese difficulties were seen as almost entirely domestic made a decisive and rapid response far more difficult.

Lessons from the Japanese experience are several. First, and perhaps most important, is that an undercapitalized banking system can retard, if not entirely stifle, an incipient recovery even when fiscal policy is expansionary. Permitting evergreening of lending is a disastrous policy. Second, efforts by banks (and acquiescence by the government) to hide their difficulties not only delay recovery but create uncertainty about the financial system as a whole.³⁸ Third, unless measures to restore healthy banks are sufficiently large, they do not significantly contribute to the resolution of the problem. In the Japanese case, the NPLs written off by the banks are estimated to have equaled 19 percent of GDP, while the largest amount allocated to support the banks was about 3 percent of GDP. Fourth and finally, when banks continue to roll over NPLs, they are starving the potential new entrants (especially small and medium enterprises) of credit, and hence reducing growth.

The “lost decade” of the 1990s in Japan was marked by successive stimuli and financial interventions. But most of these were too little, too late.³⁹ Taken alone, the Japanese experience would not conclusively suggest a lesson. But across the other crisis Asian economies, strong actions taken initially were associated with a more rapid and stronger recovery, and almost certainly smaller losses.

The South Korean response was the strongest, and the trough was reached by mid-2008. The reduction in leverage, the removal of toxic assets, and other measures were sufficient enough that recovery started within six months and was strong.

For each of the other Asian countries, the response was slower and weaker, and the upturn was later and less rapid. Indonesia, with the weakest and slowest response in large part because of political upheaval, took the longest time for recovery to resume.

There is a general lesson that immediate credible strong action (with regard to removal of toxic assets, recapitalization of banks, deleveraging of firms, and to fiscal stimulus) is economic, both in the sense that government expenditures and losses in the financial system would be smaller, and in that the length and the severity of the downturn is more limited, while the upturn not only comes sooner but is stronger.

The Korean experience reinforces the Japanese lessons. Although the crisis was triggered by difficulties within the banks that were intensified by the exchange rate regime, the crisis was financial once the exchange rate had been allowed to depreciate and float. It was already seen that the underlying problem had been a failure of the financial system to develop commensurately with the needs of an increasingly complex modern economy. This was connected to the problems of the chaebol. They had been heroes of Korea's hugely successful growth experience, but had accepted government restrictions and had their own banks each financing much of the needs of the individual groups.

The spillover from the exchange regime to the financial situation is evident from the evolution of the economy, as detailed earlier. First, in the run-up to the crisis, short-term foreign debt was about seven times Korean foreign exchange reserves. The authorities attempted to defend the currency initially (after the Thai crisis was under way) but simply were unable to continue doing so.

The exchange rate was depreciating rapidly, and the authorities tightened the money supply, including a sharp rise in the interest rate. While this stabilized the currency, it made the plight of the banks, already hit by a mismatch between their loans (denominated in won) and their liabilities (denominated in foreign exchange), still worse. The chaebol were highly leveraged, averaging about 400 percent debt relative to equity, so rising interest rates (when there had already been a buildup of NPLs) made their situations worse and increased the banks' NPLs.⁴⁰

In the run-up to and during the crisis, a factor that apparently intensified difficulties in many of the Asian economies, and certainly in South Korea, is that market participants quickly learned that earlier information they had received had been inaccurate. Cho (2009) points out that, even in 2008 when the Koreans held high reserves, "The past record of credibility of the Korean government's statistics on the amount of total foreign debt and usable foreign reserve did not help in gaining full credibility for the government guarantee" (p. 19).

6. Lessons for Post-Crisis Policy

Perhaps the most important conclusion that can be drawn from crises in many countries is that delays in recognizing and confronting the difficulties in the financial sector are costly. Denial by officials may be understandable, but when the measures taken are timid relative to the magnitude of the problem, or when they are undertaken after significant delays, the costs of the cleanup mount.⁴¹

Both the credibility of the authorities and the transparency of the situation and the measures taken are also crucial. If it is widely believed that the author-

ities do not fully recognize the difficulties, or that they are taking only half-hearted measures to change the situation, policies are unlikely to succeed.⁴²

Moreover, in almost all crisis situations, the crisis happens because of underlying weaknesses in the economic policy framework and economic structure. It is now generally recognized in Korea that the cleanup of the banking system, and the reduction in chaebol-linked bank lending, were essential.⁴³ But in the first weeks of December 1997 after the initial IMF program, capital outflows continued, as there were considerable doubts about the determination of the newly elected government to address the issues sufficiently. It is noteworthy that, despite considerable speculative pressure, the economies of Hong Kong, Taiwan, and Singapore survived without a crisis.⁴⁴ They all had stronger economic policies during the period, reflected in many ways including large foreign exchange reserves and relatively low short-term debt, and took strong measures as soon as pressures on their currencies and finances were evident.

It is also notable that growth can resume fairly quickly when strong measures are taken. Most forecasts of post-crisis growth in the Asian countries were unduly pessimistic (with the probable exception of Indonesia).⁴⁵ Once the situation was stabilized, growth rapidly resumed.

For emerging markets, further lessons derive from the necessity to maintain consistency between policies toward exchange rates and monetary and fiscal policies. Maintenance of adequate foreign exchange reserve levels, and guarding against significant mismatches in the currency denomination of assets and liabilities (of the financial system and of large borrowers) are also vital.

But perhaps the strongest lesson from all of the crisis situations is the urgent necessity of restoring the financial system by recapitalizing the banks, removing the NPL from bank portfolios, and enabling the resumption of the flow of credit. Fiscal stimulus may be necessary and can provide a temporary boost (as it did in Japan in 1996), but if the financial system remains crippled, recovery is not sustainable. Growth can resume before credit starts expanding, but sustaining that growth requires a healthy financial system.

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NOTES

1 Formally, the south became the Republic of Korea and the north the People's Republic of Korea. Since North Korea is not discussed at all in this paper, I shall refer to South Korea as Korea.

2 Korea's per capita income is estimated to have been below that of many African countries at the time. Maddison (2003) estimates South Korean per capita income in 1960 to have been \$1105 in 1990 international purchasing power parity dollars. For comparison, his estimates are \$1523 for Congo, \$1246 for the Cote d'Ivoire, and \$1378 for Ghana.

3 Of course, rapid economic growth also started in the People's Republic of China in the early 1980s, although that experience is not covered here.

4 Japan's rapid economic growth had slowed sharply after the first oil price increase in the early 1970s. However, the "tigers" all continued rapid growth. Their success in so doing, relative to the difficulties faced by other developing countries, was a major factor in convincing the policy community of the wisdom of an outward orientation in trade.

5 They also had positive or at worst small negative current account balances, which was partly reflected in the high reserve levels.

6 Most of those economies have maintained fairly fixed, if not rigid, exchange rates, relatively low levels of foreign exchange reserves, sizeable short-term capital inflows, and fragile banking systems. In many of them, households had taken out mortgages in foreign currency, rendering them highly vulnerable to any exchange rate change and increasing political resistance for necessary changes.

7 Hong Kong has operated a currency board throughout the past several decades. The regime was successfully defended during the Asian financial crisis.

8 In the current crisis, countries such as Australia, India, South Korea, and Chile that have let their exchange rates adjust appear to have fared better than those that have kept their exchange rates within narrow bounds. The obvious exception is China, although that country has a relatively closed capital account and its currency was widely believed to have been undervalued.

9 The "again" reference is to the Mexican crisis of 1994. Ito's analysis pinpoints the maintenance of a quasi-fixed exchange rate as a major contributor to that crisis as well.

10 See also Edwards (2003).

11 This advantage is somewhat diminished when the domestic banking system has become significantly dollarized.

12 An extreme case was Argentina after the 2001 crisis. The authorities “pesified” the banks’ liabilities (i.e., deposits, which had been denominated in pesos when the exchange rate to the U.S. dollar was one-to-one) at the rate of 3 pesos per U.S. dollar, while the assets were left at 1 peso=US\$1.

13 Even with such hedging, the problem is not entirely solved. If banks’ loan portfolios are heavily weighted towards firms whose costs have a large component of imports while their revenues are mostly from the home market, those firms can be negatively affected by exchange rate depreciation. Obtaining data on the sensitivity of individual firms’ revenues to exchange rate fluctuations is extremely difficult.

Recently, in some Eastern European countries, the same problem has arisen with respect to mortgages. Households borrowed from foreign banks because of lower interest rates and have encountered major increases in liabilities when exchange rates have depreciated.

14 Ito (2007, p. 34) also makes this point. Some of the transition economies seem not to have paid heed to this lesson.

15 Having foreign exchange reserves greater than short-term liabilities is not a guarantee, however. Sharp changes in prospects, whether originating from global shocks or from shifts to highly expansionary fiscal and monetary policy, can induce speculators to attack. But the magnitude of the impact of the projected shock or fiscal expansion has to be considerably larger if foreign exchange reserves are adequate. Some have argued that the Asian countries have overlearned this lesson from the crisis. As seen from the warnings of those concerned about a decision by foreigners to sell U.S. Treasuries in large amounts, even large dollar holdings will not necessarily ward off an attack.

16 See Rosenberg and Birdzell (1986) for an economic history focusing in significant measure on the interactions between technological advances in the real sector of the economy and financial innovation.

17 See World Bank (2004), Chapter 6 and references therein.

18 Exporters were also entitled, in the early days of the outer orientation of the Korean economy, to other privileges including the ability to import needed inputs duty-free (with minimum delays) and tax credits. These entitlements were extended equally to all who exported per dollar of exports (except for inputs for which duty-free treatment was based on an estimate of use of imports per unit of exports). They were thus export incentives, but the incentive was essentially uniform across all exporting activities. See Krueger (1979, pp. 87ff.) for a full description

19 A rough estimate would be that the 1973–74 oil price increase resulted in a deterioration in Korea’s terms of trade equivalent to 15 percent of GDP (and there had been increases in food and other commodity prices in 1972 and 1973 which also constituted a negative shock).

20 Exporters were from an early stage permitted to import goods they used in the production process. A first step on the import side was to move from a positive list (of permitted imports) to a negative list (of those prohibited). The exchange rate was also gradually unified as tariffs were reduced and export incentives reduced while the real exchange rate depreciated. Later, tariffs were further reduced and the exchange rate fully unified.

21 The same can be said of any number of other policy arenas: the foreign trade regimes that many countries (including Korea) adopted during their early years of growth would have, if unaltered, certainly retarded and perhaps even prevented a continuation of that growth. To be sure, in many countries, these regimes were sustained until it became evident that they were inconsistent with sustaining growth. Turkey (see Krueger and Turan 1993) in the late 1970s is one example, but there are many more.

22 Tornell, Ranciere, and Westermann (2003) have provided extensive evidence that over the period through the 1990s those countries that had financial crises in fact grew more rapidly than those that did not. Their explanation is that more rapid credit expansion is a concomitant of more rapid economic growth; more rapid credit expansion means that more risk, and more high-return activities, are financed. Hence, the overall growth rate is higher.

23 There is considerable evidence in both Japan and Korea that a major reason for the retardation of growth was the reduced credit available to support expansion of small and medium enterprises, as banks could not free their resources from the large but nonperforming borrowers.

24 It might be argued that the converse was also true: high rates of growth had been sufficient so that the financial system had been able to survive the problems that showed up once growth had slowed down. For present purposes, it matters little whether slowing growth led to financial difficulties that were already there or whether financial repression led to slowing growth.

25 See Krueger and Yoo (2002) for a full analysis.

26 The Korean growth rate was, however, more than respectable by contemporary standards, with a growth rate between 7 and 9 percent in the three years preceding the crisis, and inflation less than 5 percent. The current account deficit and foreign debt (especially short-term), however, were increasing. By 1996, the current account deficit was 4.4 percent of GDP. It fell in 1997 (presumably as financing was not available), and turned strongly positive in 1998. Foreign debt had risen from 20 percent of GDP in 1990 to 33 percent in 1997 and 47 percent of GDP in 1998. See Hahm and Mishkin (1999), Tables 1 and 2.

27 Yoo and Moon (1999), p. 266.

28 The crisis could probably have been prevented as late as the summer of 1997 had appropriate policy actions been taken at that time. Kim Kiwhan believes that if Parliament had passed a financial legislative package proposed on November 16, 1997, even then the full-blown crisis might have been averted (Kim 2006, p. 21).

29 The triggering event for acceptance of the IMF program in December 1997 immediately prior to the election was that reserves were literally exhausted. After months during which all three presidential candidates insisted that they would not accept support from the IMF,

gross reserves fell to zero by December 3, and the Korean government would have been forced to default had not IMF support been forthcoming. It is often forgotten that the IMF team had virtually no time in which to devise a program, as they had not been able to meet with their Korean counterparts until very shortly before the crisis.

30 The interest rates in some Southeast Asian countries were below those in Korea, so banks were borrowing in Thailand, Indonesia, and other countries to lend in Korean won at a higher interest rate. When the crises came in Southeast Asia and currencies were devalued, the banks lost heavily.

31 In Ito's view, Korea's crisis was one of liquidity only, whereas other Asian crises were solvency crises. See Ito (2007), p.38.

32 Japan had joined the OECD in 1964.

33 Much bank lending was connected within the same keiretsu. The extent of evergreening was almost surely underestimated. See Hoshi (2001).

34 In 1997, economic activity was rising, and the government imposed (increased?) the value added (consumption?) tax. That was quickly followed by another downturn in economic activity.

35 Until 1998, public reporting of nonperforming loans was undertaken only by large banks, and the definitions of nonperforming loans were very loose: only those loans to failed enterprises or on which there had been no payments for more than six months were recorded. There were also other changes that enabled banks to show more favorable balance sheets up to that time, including permitting banks to record assets at either cost or market value. After 1998, reporting became standard, and the criteria for NPLs were tightened. See Hoshi and Kashyap (2009) for an account.

36 Among other problems, the banks had recorded "deferred tax assets" as part of their capital base. These "assets" were the tax deductions the banks might (if profitable) use in the future once they became profitable again, because they had recorded losses. These were sizeable and of course were not fungible, and were usable only against profits, which the banks did not have.

37 It is unclear how much equity banks really had. Hahm and Mishkin (1999) have shown that much of the reported capital should not have been treated as equity. Moreover, had banks recognized nonperforming loans and charged them against assets, reported equity would have been considerably smaller.

38 Hoshi and Kashyap (2009) report that in 2002, when the banks reported increased equity, six independent financial analysts all reported that the same banks had negative equity.

39 Hoshi and Kashyap (2009) point out that, although Japanese politicians felt politically constrained as to the amounts they could spend to attempt to restore the banking system, the actual amounts voted in by Parliament amounted cumulatively to 3 percent of GDP. This compares with the 60 percent of GDP increase in Japanese government indebtedness that resulted from repeated fiscal stimulus efforts. It therefore seems reasonable to conclude that larger expenditures in the early years of the banking difficulties might have led to lower overall expenditures.

40 The authorities also instituted blanket deposit insurance for a period of three years. It was withdrawn at the end of 2000. This seems to have been essential to stop runs on banks after some merchant banks had been closed early in the crisis, leading depositors in other banks to wonder how long their banks would remain open.

41 Korea's reforms were far-reaching and undertaken rapidly. Reforms included the reduction of trade barriers and promotion of foreign direct investment inflows; improved corporate governance measures especially in the chaebol; recapitalizing the financial system and removing NPLs; creation of a new financial regulatory framework; privatization of many state-owned enterprises; and removal of some labor market regulations. See OECD 2000, pp. 29ff.

42 This seems to have been the case initially in Korea. Even after the IMF program was announced in early December, large capital outflows continued. It was not until the major private banks committed to rolling over their loans to Korean entities and pledged some new money that the downward pressure and massive outflows ceased. The magnitude of the new pledges was evidently sufficient to restore credibility, whereas the initial IMF package had been insufficient to do so in light of the magnitude of private debt.

43 The Korean authorities went far beyond the measures discussed here, as they took measures to improve corporate governance, bank regulation, account transparency and a number of other issues. These measures may or may not have been essential (although they were almost certainly beneficial to the economy) but they certainly reinforced the credibility of the government's commitment to strengthen and restore the financial system.

44 These economies were all threatened, however, and the responses of the authorities were clearly crucial in preventing crisis. How one should classify the Philippines is questionable. For a considerable period of time, it appeared that the Philippines would confront a crisis. But policies were adjusted with the support of the IMF, and an outright crisis was avoided.

45 Other countries where the far-reaching cleanups have been undertaken have also exceeded expectations for their recovery. Turkey after 2001 and Russia after the 1998 crisis are prominent examples.

COMMENTARY
Lessons from Asian Financial Experience

Andrew Sheng

Anne Krueger has provided us with an authoritative analysis of the Asian financial experience, particularly focusing on the Korean and Japanese experiences that are common to the 1997–98 Asian crisis and the current global crisis. She has drawn on a wealth of recent papers and drawn important common lessons, divided into four major parts: first, the relevance of rapid growth leading up to crisis and the importance of a well-functioning financial system; second, a set of lessons relevant mainly for emerging markets; third, key financial sector issues from Japan and Korea that are relevant to the crisis economies in Asia; and fourth, crisis and post-crisis management issues.

Krueger's analysis stems from the mainstream of economic analysis, which has focused on the importance of well-functioning financial systems, their capital adequacy, and their contribution to financial stability. Financial systems have four important functions that policymakers neglect to their peril: resource allocation, risk management, transparency, and corporate governance. Weaknesses in any of these functions would contribute to the weakening of the real sector, leading to crisis and losses in output and employment.

Common Lessons for Emerging Markets

As Krueger has pointed out, financial crises are complex and have many origins. They all start with prosperity. In the case of Asian countries, they started with very rapid growth, policy mistakes, and complacency that led to asset bubbles; once the bubbles collapsed, there followed large capital outflows, insolvency in the real and banking systems, and losses in output, with huge fiscal deficits arising from the rescue efforts.

Among the common lessons for all emerging markets, the first is the need for a consistent macroeconomic policy regime, in particular a flexible exchange rate regime consistent with fiscal and monetary policies. The second is to avoid mismatches between banking assets and liabilities in terms of both maturity

Author's note: *The views expressed are purely personal and not associated with the China Banking Regulatory Commission.*

and foreign exchange (consider, for example, the famous double mismatch in the Asian financial crisis). Third, emerging markets should eliminate financial repression after rapid growth and deepen the capital and debt markets. Fourth, policymakers and financial regulators should avoid complacency and favor more market-oriented policies, because rapid growth and success does not necessarily guarantee future success. Indeed, the 1997–98 Asian crisis affected some highly successful countries, not failed economies.

A final common lesson for emerging markets is that immediate, credible, and forceful action (such as removal of toxic assets, recapitalization of banks, deleveraging of firms, and fiscal stimulus) can result in lower losses, can limit the length and severity of downturns, and can speed up and strengthen economic upturns.

Lessons from Japan

Krueger rightly points out that the 1997–98 Asian financial crisis encompassed the prolonged Japanese crisis, which resulted in nearly two decades of low growth, deflation, huge fiscal debt, and zero interest rates. Her analysis of the Japanese and Korean experiences draws significant implications for the resolution of the current global crisis. As shown in Table 1, Japan was the largest economy by far in East Asia in 1996, nearly five times larger than China and double the size of the rest of East Asia.

There was a marked difference between Japan and the rest of the East Asian crisis economies: Japan had mostly domestic debt and a flexible exchange rate, while other countries were accused of pursuing the “impossible trinity” of fixed exchange rates, independent monetary policy, and no capital controls.

TABLE 1
GDP of Selected Countries
(current exchange rate in USD billions)

	1990	1995	1996	1998	2006
Japan	3,031	5,278	4,638	3,872	4,367
China	388	728	856	1019	2,630
Korea	264	517	558	348	888
Indonesia	126	223	251	105	364
Thailand	86	168	182	111	206
Hong Kong	77	144	159	167	189
Malaysia	44	89	101	72	151
USA	4,268	7,398	7,817	8,747	13,245

Source: IMF data.

But the Japanese experience was similar to others during the pre-crisis period of rapid economic growth that resulted in real estate and stock market bubbles accompanied by problematic lending. Like almost all other East Asian economies, Japan still has a bank-dominated financial system, and mistakes of forbearance, evergreening, and late resolution of bank failures delayed the economic recovery.

Indeed, Krueger perceptively pointed out a mistaken policy assumption that, if only economic growth were to resume, the debtors would regain profitability and banks would grow out of their nonperforming loans. I suspect that this growth assumption persists even in current rescue plans. The Japanese experience was one of repeated stimulus packages, with annual fiscal deficits of over 5 percent that led the country's debt to grow to nearly 200 percent of GDP. This debt was owed mainly to residents, but was sustainable only with zero interest rates.

Krueger shares the common Western view that Japanese reaction to the crisis was "too little, too late." Many of my Japanese friends beg to differ. Their difficulty was not a technical issue of how to respond, but how to garner public, political, and legislative support for the rescue of banks. Exactly like the reaction of the U.S. Congress, which initially rejected the Treasury's rescue plan in the fall of 2008, the Japanese electorate felt—not without good reason—that overpaid bankers got themselves into trouble and should therefore get themselves out. Hence, the bank write-offs of credit losses were 19 percent of GDP compared with fiscal support of only 3 percent of GDP. But the biggest support of banks came through the zero interest rate policy, which gave the banks a positive interest rate spread, similar to the current U.S. policy. In other words, both the past Japanese solution and the current U.S. solution relied on a guarantee of stock and flow bank rescue policy, rather than balance sheet surgery to "carve out bad loans."

Implicit in the Krueger analysis is that an undercapitalized banking system can retard an incipient recovery, even when fiscal policy is expansionary, and forbearance and evergreening of loans by banks generally lead to disaster. In other words, efforts by banks (and acquiescence by the government) to hide their difficulties not only delay recovery but can create uncertainty and a lack of confidence about the financial system as a whole. Thus, Krueger subscribes to the "whatever it takes" approach, using sufficiently large measures to restore banks to healthy positions. She noted correctly that bank deleveraging starved new entrants (small and medium enterprises) of credit and hence reduced growth.

Post-crisis Policy and Management

Based upon the above survey, Krueger draws the conclusion that delays in recognizing and confronting the difficulties are costly. Crisis management requires credibility, built through financial condition transparency and decisive actions. There must be consistency between exchange rate, monetary, and regulatory policies. She believes that the most important lesson is the need to recapitalize banks and address nonperforming loans. As in the case of Japan in the last 20 years, fiscal stimulus can provide a temporary boost, “but if the financial system remains crippled, recovery is not sustainable.”

I agree with the analysis provided by Krueger, but I would like to widen her analysis beyond one or two countries and beyond economics to politics, since flawed politics are always the root causes of financial crisis. Having been in the trenches during the Asian crisis 12 years ago and during the post-crisis resolution and reform efforts, I wrote a book, *From Asian to Global Financial Crisis*,¹ which was published this year. My research into individual crisis countries and into the group as a whole showed that, in addition to the commonalities identified by Krueger and others, the interactivity and interdependency within the region complicated collective action and created dilemmas which led to the crisis and hindered the recovery.

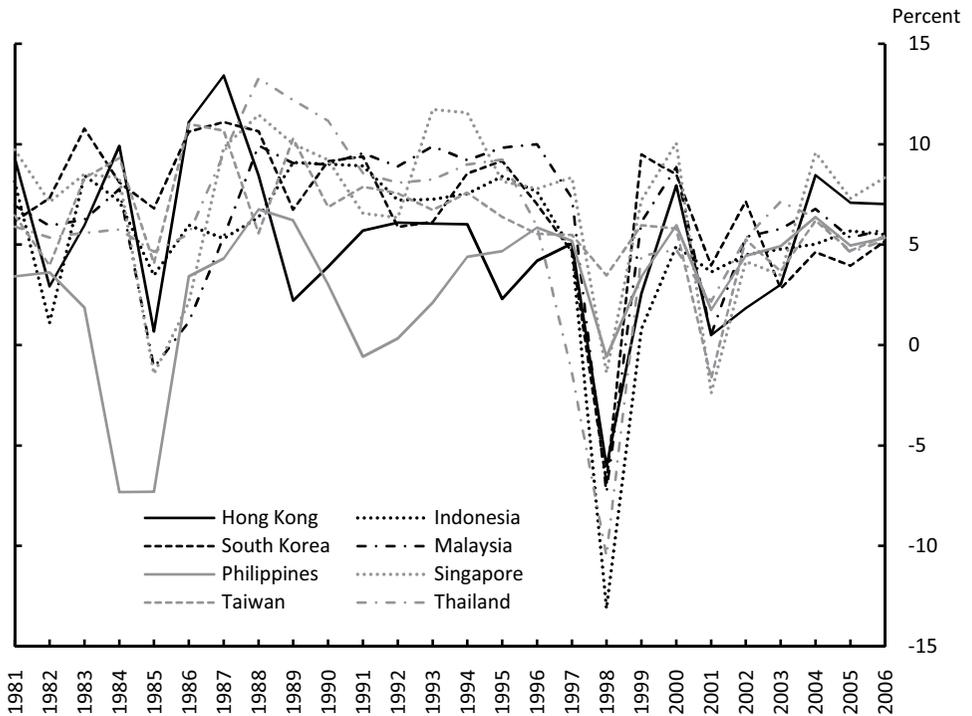
The fact that the Asian crisis contagion hit several countries at roughly the same time demonstrates that this was a relatively new phenomenon. I call this a network crisis, because East Asia networked to form the global supply chain with Japan at its head. The main customer was the U.S. market, which explains why the global supply chain basically linked to the dollar through either a fixed peg or a managed float. Basically, the supply chain required member economies to adopt stable parities against each other. I do not justify pursuit of the impossible trinity, but I understand why, for various political reasons, central banks were reluctant or unable to exit a previously successful policy and adopt a floating regime. With high dollar-yen volatility, the Asian supply chain was a network with two standards.

Indeed, the analytical framework of a network crisis is useful because it gives us a holistic view of the complex, highly concentrated, interconnected, interactive/interdependent, opaque financial system with incentives that were procyclical and contained highly systemic risks.² We need this network type of analysis because all social institutions, including banks and financial systems, are ecosystems, which are dynamic and formed through the interaction of the human and bureaucratic behavior of participants.

The extensive interdependency between East Asian economies and the U.S. can be seen from Chart 1, which illustrates the synchronization of the Asian trade cycle. As the saying goes, if the U.S. sneezes, Japan catches a cold, and Asia gets pneumonia. This time around, the U.S. has had more than a cold, and Japan and the exporting nations in Asia are badly hurt, but due to their healthier macroeconomic conditions (partly because they learned from their mistakes 12 years ago), their recovery has been more marked.

Ecosystems are complex institutions, but to work effectively and stably they need simple rules that are easy to enforce. Enforcement shapes the incentive structure to ensure stability. However, lack of enforcement against risky or arbitraging behavior can build up huge opaque risks and imbalances that ultimately lead to crisis. I liken crisis to warfare because war leads to loss, just like financial crisis. To paraphrase German strategist von Clausewitz, substituting

CHART 1
Gross Domestic Product in Constant 2000 US\$



Source: World development indicators online.

“war” with “crisis,” you get, “Everything in crisis is very simple, but the simplest thing is difficult. The difficulties accumulate and end by producing a kind of friction that is inconceivable unless one has experienced crisis.”

One of the reasons why everyone failed to detect or prevent the Asian crisis and the current crisis is that our academic and bureaucratic disciplines are so specialized and compartmentalized that we see only part of the picture, rather than linking its parts together.³

For example, most economists still look at flows to explain behavior, whereas Nomura’s Richard Koo was the first to point out that the Japanese crisis and the current crisis can be labeled a balance sheet crisis.⁴ This is very evident from Table 2, which shows that almost all the crisis economies (with the exception of South Korea) had net international debt positions of more than 50 percent of GDP in 1996. If the IMF had emphasized this earlier than 2006, we might have been more sensitive to unsustainable foreign exchange imbalances.

Given the fact that the East Asian economies had large banking systems relative to GDP and that the banks lent heavily to finance the stock and real estate markets, it is not surprising that collapses in the real estate and stock markets led to huge losses and undercapitalization of the banking system.

This is one reason high interest rates and cuts in fiscal expenditure were clearly the wrong policies to pursue during the early stages of the Asian crisis. High real interest rates would make the overleveraged corporate sector more distressed, leading to even larger losses in the banking system. However, because of the openness in the capital account, East Asian economies could not use higher interest rates for fear of inviting even more hot money that would inflate the domestic bubbles even more. In other words, the Asian crisis was

TABLE 2
Net International Position (NIP) (+asset/–liability) of Various Economies

	NIP 1996 (USD billions)	NIP as % of GDP, 1996	Fall in GDP 1997/98 (%)	Change in exchange rate (+/-) 1998/97	Remarks
Japan	+890.0	+19.0%	-8.5%	-10.7%	
China	-122.9	-15.1%	+5.3%	+0.2%	Protected by exchange control
Indonesia	-129.4	-56.1%	-55.8%	-51.4%	
Korea	-50.2	-9.0%	-33.1%	-50.2%	Bank run causing exchange overshoot
Malaysia	-55.9	-55.4%	-27.9%	-35.0%	
Philippines	-41.6	-49.2%	-20.5%	-34.2%	Already under IMF Program in 1997
Singapore	+80.2	+87.0%	-14.2%	-14.9%	Contagion effect
Thailand	-101.8	-55.9%	-25.9%	-45.8%	

Source: Calculations from Lane and Milesi-Ferretti (2006).

inextricably tied to the policy dilemmas of globalization, in which most countries were not sure how to create the right blend of policies, given that large volatile capital flows (now identified as the leveraged carry trade) could lead to excess liquidity and highly distorted domestic sectors.

Conclusions

If we accept that financial crises have origins that are complex and are tied to the whole range of policies, flawed institutions, and feedback through interaction across borders, then we should recognize that their resolution requires much better international cooperation than previously thought. In many ways, a collective action problem already exists in coordinating the many silos within domestic financial systems that regulate financial stability, not least the Ministry of Finance, the central bank, the financial regulators, and increasingly the influence of the legislature that must approve legal and structural changes. Legislatures can protect strong vested interests and may not be willing to respond with the speed required at the technical level. These collective action traps delay or impede many actions or policies that can be identified at the technical level, but cannot be enforced or implemented at the political or bureaucratic level.

If the collective action problem of coordinating policies is difficult at the national level, the difficulties at the regional and global levels are even more Herculean. Hence, the biggest lesson that I draw from the global financial crises is that countries must accept that they have to work together in a complex ecosystem with many vested interests that require lots of carrots and sticks to get everyone to cooperate for the common good. We have to recognize that the greater the complexity of issues, the greater the costs and the difficulties, from identification, diagnosis, and prognosis to implementation, enforcement, and action, and these can lead to more opportunities for arbitrage, fraud, and further distortions that benefit some factions and vested interests. Patchwork and partial solutions are more likely to delay real action, a problem identified by Krueger during the Japanese crisis.

The only way we can achieve common collective action is through simplicity, sometimes unfortunately through a race to the lowest common denominator. If individual countries seek to flee and exit for the door, it may create massive panic and large public loss unless prevented by a collective response.

If we do not simplify our financial structures and make the difficult choices on which standards to enforce, so that the financial institutions will not exploit a massive moral hazard, then we will not have learned any lessons from the past and we will be more likely to experience future crises.

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NOTES

- 1 Andrew Sheng (2009c).
- 2 See Haldane (2009) and Sheng (2009b)
- 3 Capra (1982).
- 4 Koo (2009)

GENERAL DISCUSSION

Lessons from Asian Financial Experience

Chair: Rakesh Mohan

Mr. Mohan: Questions?

Ms. Hughes Hale: Concerning current weaknesses, I'd like to ask Andrew Sheng a question about China. You've described why savings is so high. So, where is the increase in bank lending going? Is it going to the state-owned enterprises, and is that going to cause a potential asset bubble? Or is it going to SMEs (small and medium enterprises), which will increase employment and then increase consumption? The second question I had is, there is an assumption that the social safety net is expanding, but the number of doctors and hospitals in China, according to my statistics, has actually decreased over the past 10 years of prosperity in China. If that is true, households are going to continue to be really incentivized to save. So, I'm wondering if you think that consumer spending in China will rise or not.

Mr. Mohan: I think we'll collect three or four questions.

Ms. Amador: You mentioned that the opacity in the data on the financial systems and on the market economy is one of the reasons for the herd behavior of market participants during the Asian financial crisis. Do you think that there has been an appreciable shift in the information and disclosure practices of the Asian economies in general?

Mr. Mohan: Taka.

Mr. Ito: Andrew had an interesting table comparing the Asian currency crisis with the current crisis. In the current crisis, you were referring to both the U.S. and European emerging marketing economies, I suppose. My question to Andrew and Anne is, what went wrong in Latvia, Iceland, Hungary, and other European emerging market economies in this global crisis? Could they have learned lessons from Asia in 1997 and 1998? And if they did, what went wrong with the IMF, which was supposed to have watched over all those things and helped prevent new crises?

Mr. Hooper: Question for Anne. I wonder if you would comment on whether the current consensus forecast for the global economy might be a little bit pessimistic. I think conventional wisdom has been influenced strongly by the seminal work of Reinhart and Rogoff, that financial crisis begets sluggish recoveries. But your findings suggest that maybe it's a little more nuanced, that perhaps one doesn't need to be quite so pessimistic in light of how aggressive the policy response has been this time. I was wondering if you might comment on that.

Mr. Mohan: If I can add to the first point on Chinese consumption and the relationship with social security. If anything, the condition of Indian social security is even worse than the Chinese social security situation. So why do Indian households consume more than the Chinese? Is improving social security a real solution for underconsumption by Chinese households?

Mr. Mohan: Anne, you want to go first?

Ms. Krueger: I think what happened—in Korea, at least—was that the authorities lowered domestic interest rates before macroeconomic conditions really called for it. In a sense, of course, they didn't know what was happening and it was a policy mistake that led to this decision because private sector spending was not that weak, though the private sector subsequently responded to lower interest rates by increasing domestic borrowing. I don't disagree with the outcome, but I do think that the carry trade was there because of what happened on the domestic front.

The question on the Chinese social safety net I will leave to Andrew. Where does the bank credit go? It seems to me that the Chinese banks are simply the government's fiscal agent, and when they are told to put the money out there, that's what they do. And it goes into infrastructure or whatever else happens to be on the drawing board when the money goes. I don't think there's any mystery about it; it doesn't necessarily go directly to consumers. The saving, however, is coming predominantly from the corporate sector. It is not coming so much from the private sector as from retained earnings on the part of the enterprises. I think the Chinese government could affect policy there, as well as work on the social safety net.

The third question was about information provision in Asia. Clearly in Korea and Japan it is much, much better than it was. Of course, we never know what isn't there. My impression is that in Korea the authorities, if anything, bent over backward to the point that once or twice I have wondered whether telling all is always a good move. I would leave it to someone like Taka [Ito] to tell me whether the Japanese authorities are going that far or not.

For Latvia, Hungary, and other Eastern European countries, the numbers on the extent to which households were taking up mortgages in Swiss francs and Swedish krona and others are truly astonishing. And in Latvia, something like 80 percent of GDP was held by households as mortgage debt in foreign currency, which means that for Latvia a big change in the exchange rate wipes out the household sector, but failing to change it wipes out the business sector, so they are really caught. So far they have tried to manage it by cutting wages 20 percent almost across the board and otherwise trying to get the price level down. Obviously they've now said that isn't enough so they're going for a second round. I think the political scientists need to tell us if that's doable or not. The big problem is that they're caught on both sides. The same in Hungary, the same in some other Eastern European countries. This buildup of foreign debt was definitely a variant of the carry trade because there was higher inflation in the Eastern European countries, their domestic interest rates were high, their exchange rate was fixed, and so households figured they should borrow in foreign exchange, which is a perfectly sensible response. Something like 60 percent of Austrian mortgages are in Swiss francs; the numbers are really huge but that's what was allowed to happen.

Are the consensus forecasts too pessimistic? I've been wanting to see what the forecasts were before the end of 1996 for the East Asian economies and then again at the beginning of the current crisis. Certainly in the previous crisis in Korea all forecasts were incredibly pessimistic relative to what actually happened. In Thailand, the forecasts were somewhat more favorable. The one country where the forecasts were not so pessimistic was Indonesia, which had a large political element to it. I haven't seen systematic documentation on this, but I believe the forecasts at that time were on the pessimistic side in all cases but Indonesia.

Mr. Mohan: Andrew Sheng.

Mr. Sheng: Thank you for the questions on China. I first want to give a caveat. Even though I've studied it, I don't consider myself an expert on the Chinese economy. I have some understanding of the banking system, so the views expressed here are all my own. On Lyric's question about the spending, and the apparent anomaly that Rakesh mentioned between Indian and Chinese household saving rates, my impression is that Chinese household expenditures actually are not low. I don't understand why it doesn't get picked up in the data. My sense is that the data reported on the investment side have a consumption element to them, but I can't say for sure. But there are several important trends to understand about the Chinese economy.

The first one is demographics. The Chinese demographic pattern is actually very similar to Japan in the late 1960s and early 1970s, when Japan was growing nearly 8 to 10 percent, and then there was a sharp falloff. China's one-child policy implies a roughly 10- to 15-year window in which there is a demographic endowment because the population is young and household saving levels are very, very high. When China opened up and Chinese enterprises engaged in exporting like the rest of Asia, there was a surge in productivity gains and the corporate saving rate went up as well. This is clearly an issue.

The second major trend is the massive urbanization going on in China. There's a massive shift from rural areas towards urban areas, which means that the pressure on the infrastructure in the cities is huge, and that's why massive public investment is needed. Even considering what appeared to be excessive building, for example in Pudong and Shanghai in the mid-1990s, we see today that there's just not enough supply relative to the demand. So what appears to be overinvestment in infrastructure, in fact because of urbanization has actually created its own demand. So the predictions of large nonperforming loans may not come true.

The social safety net is an area that must be addressed, and the Chinese government is addressing this very seriously. It will take time, there's no doubt. You're actually talking of a massive change in the social security system as well as the equivalent of Medicare health-care reform. Over the last 10 to 15 years, rural health care has not gotten as much attention as I think it deserves, so the Chinese government is pouring a lot of money, particularly through the \$4 trillion stimulus package, into the rural areas. After the Golden Week holidays in October (2008), spending has gone up a lot. So I think this shift towards domestic consumption is increasing.

On the question about data in Asia, the overall transparency of Asian statistics has improved quite a lot, but what I still consider to be a major failing is the lack of implementation of UN SNA standards on flow of funds and balance sheet data, particularly balance sheet data on corporate leverage and local government leverage, as well as real estate data—they are just not available. And if we look at what we mean by macroprudential problems, it really means that the balance sheet numbers don't add up. They don't make sense. And if they don't make sense, it's very likely you've got a huge problem sitting in your hands. Thus, it's very important for statistics departments within Asia to improve the quality of data they collect. I agree with Taka in that I'm surprised that certain parts of Europe repeated the Asian double mismatch before the 1997–98 crisis when currency and maturity mismatches were widespread. Anybody who saw

that Asian crisis should know that foreign currency borrowing to speculate in domestic markets is asking for trouble.

Mr. Heng: I would just like to share a comment and then a question for both Professor Krueger and Andrew. My comment is that, when you look at the transmission of the current financial crisis, the most significant channel of transmission to Asia was not through the financial sector, but rather the real sector. This very significant fact needs further study, which I think Morris Goldstein and Daniel Xie's paper helps provide.

Let me just share two other bits which I think may be useful. One concerns the psychology of policymakers as well as bankers after the Asian crisis. Bear in mind there were two very significant events in Asia over this period. One was the 2001 IT (information technology) downturn, which affected quite a number of Asian economies. The other one was the 2003 SARs outbreak, which had a very big impact on the more open economies in the region. As a result of that, both regulators and bankers acted quite conservatively. The other point is that the structure of finance in Asia has been very conservative and very plain vanilla. There was none of the complex stuff and most of it was oriented towards real economy development, growth, exports, and so on. However, this has the implication that you are more likely to get funding if you are an exporter with a known strategy than if you're a domestic SME or an entrepreneur thinking of doing something new. In that context, I agree with Professor Krueger's comment that in Asia the discussion ought not to be about regulations per se, but about development and innovation in the financial system to support growth.

And my question is, in the context of our earlier discussion about rebalancing growth and a new growth strategy, what sort of changes do Professor Krueger and Andrew think are needed in the financial sector in Asia to support a new growth strategy?

Mr. Mohan: Jacob Frenkel.

Mr. Frenkel: My comment is stimulated by Andrew's remarks. You spoke about the role of demography. You spoke about increasing urbanization in China, and indeed, the way I see it, there was a political decision to engage in massive urbanization. To sustain it, the Chinese authorities had to provide employment to the migrants. To provide employment, they had to be engaged in the production process. Hence, output grew. Without domestic demand to sustain it, you have to rely on exports. Therefore, as long as there is no domestic demand, and as long as the decision to pursue greater urbanization continues, you will need

to continue to rely on exports, which explains the reluctance of the Chinese authorities to appreciate the currency. To get out of this loop requires a strategy of increasing domestic demand, but that likely involves a very long process, as you just said. One way to shorten the process and reduce domestic savings and increase domestic demand is to focus more on the corporate sector. Much of the savings in China, as well as elsewhere in Asia, comes from corporations that do not distribute dividends. Taxing these savings could encourage greater distribution of dividends.

Let me make one more point about the demographics. Indeed, China has an aging society, and in fact I saw a demographic projection that between now and the year 2030 there will be about 150 million more Chinese, but all of them will be concentrated in the age 55 cohort. If you want to have more friends around you, you'd better be 55 and above. The other cohorts literally shrink. This situation differs greatly from that in India. In India, you will have probably 300 million additional people but with attractive growth in younger age cohorts.

Mr. Mohan: Thank you. I'm afraid time is up for questions. Anne, would you like to go first?

Ms. Krueger: I think much of it was directed towards Andrew. What changes are needed to support Asian growth going forward? I think we've already talked about shifting more toward domestic demand, avoiding more protection and lowering barriers for domestic economic activities. At least there, I think, it really is a bit country-specific. In Japan, quite clearly, there are a lot of things one could do by way of changing land regulation. In India as well land use regulations are important, where regulations on retail and protecting the "ma and pa" stores have clearly held up any productivity growth in those sectors. In other countries, it is important for politicians to interfere less than they otherwise would by getting in and throwing a lot of sand into the system. For sectors where there isn't much foreign competition, it's easier to maintain archaic regulations that thwart productivity growth and change. I think that for each Asian country it will be incumbent to begin looking more closely at some of the things that have been holding up growth within their domestic markets.

Let me just make one comment on the one-child policy and what it's done. I agree its main purpose is demographic, but I wonder: If people know that they've got one child and only one child to support them in their old age, the motive to save is likely a lot stronger than it was in traditional society. It seems to me that we have underestimated this effect on saving. Quite clearly the motive for health-care saving is incredibly strong at the current time as well.

Mr. Mohan: Let me just add to the observation you made when you were giving your discussion comments about the deleveraging of the corporate sector that took place in Asia after the Asian crisis. Is there an analogy between that development and the deleveraging of the financial sector that is happening now in Europe and the United States? Does this shed any light on current proposals for increasing bank capital ratios and so on?

Mr. Sheng: Well, I think that Asian capital adequacy ratios currently are actually fairly okay because most of it is core capital, whereas, if I understand it correctly, the problem with the Western banking system is that the core capital—tier one—is actually relatively small, while tier two capital is fairly large. Although I'm entering into a very controversial area, there is not just an issue about appropriate capital ratios. There's also the issue of the quality of the provisions against nonperforming loans. Of course, if you don't have enough provisions you're wiped out. But I think the lesson of the Asian crisis was that a lot of banks looked as if they had enough capital, but the provisions were clearly inadequate. This time round, I think everybody has gotten a little bit smarter, so Asia didn't suffer so much through the financial channel. And I agree with Heng Swee Keat, this time around the transmission channel was primarily on the real sector side. The crisis that Asia is facing at the moment was amplified by the Asian global supply chain; that supply chain was designed to supply goods to both Europe and America, but suddenly exports fell somewhere between 25 to 50 percent. So it's very clear that there was no decoupling, though the degree of linkage varied. The countries that had very large domestic markets did not suffer as much as those countries that were relatively small, such as Hong Kong, Singapore, and others who could only export, whereas Indonesia and China could switch to domestic production. The simplest example I found was a suit manufacturer; he said he was not suffering because he could switch very rapidly to domestic production, since all Chinese in the rural areas need to buy a suit when they get married. The manufacturer sold a cheaper version and could compensate somewhat, though not completely, against his export losses.

On the regulation point by Heng Swee Keat, I think, there is a major question facing Asian financial institutions of what business model to follow. At one time they all wanted to be another Citibank, but now they realize that the universal banking models have some complications. So they are beginning to rethink the relative merits of the investment banking model. Very clearly Asian regulators are now thinking about financial innovation, not in the context of increasing leverage, but rather in terms of how better to serve the real sector.

That's the area we're all struggling with, whether we use technology or service quality, et cetera.

On Jacob Frenkel's point, I would agree that the big problem with Asian corporate governance is that the corporate sector is not paying out enough dividends. And that's why the retired populations in high savings economies in Asia actually don't have much cash flow for expenditures. So I would actually encourage Asian corporations to save less, increase their capital efficiency, and pay more dividends.

Mr. Mohan: Thank you very much, Anne and Andrew. Anne, I can't let you get away with that graph that you put up earlier comparing growth in India and Korea, because the higher growth of Korea had nothing to do with its financial sector. Given Korea's crisis experiences, presumably the Korean financial sector did not perform much better than the Indian financial sector over time.

Ms. Krueger: But the negative effects of the financial crises on Korea's growth were dominated by a higher overall long-term growth path.

Mr. Mohan: That is true, but the financial sector didn't have very much to do with the differences. I thought I would have the last word before you would answer.

Ms. Krueger: Not a chance.

Mr. Mohan: Thank you very much, everyone.

Global Imbalances and the Financial Crisis: Products of Common Causes

Maurice Obstfeld and Kenneth Rogoff

This paper makes a case that the global imbalances of the 2000s and the recent global financial crisis are intimately connected. Both have their origins in economic policies followed in a number of countries in the 2000s and in distortions that influenced the transmission of these policies through U.S. and ultimately through global financial markets. In the U.S., the interaction among the Fed's monetary stance, global real interest rates, credit market distortions, and financial innovation created the toxic mix of conditions making the U.S. the epicenter of the global financial crisis. Outside the U.S., exchange rate and other economic policies followed by emerging markets such as China contributed to the United States' ability to borrow cheaply abroad and thereby finance its unsustainable housing bubble.

In my view . . . it is impossible to understand this crisis without reference to the global imbalances in trade and capital flows that began in the latter half of the 1990s.
—Ben S. Bernanke (2009)

1. Introduction

Until the outbreak of financial crisis in August 2007, the mid-2000s was a period of strong economic performance throughout the world. Economic growth was generally robust, inflation was generally low, international trade and especially financial flows expanded, and the emerging and developing world experienced widespread progress and a notable absence of crises.

This apparently favorable equilibrium was underpinned, however, by three trends that appeared increasingly unsustainable as time went by. First, real estate values were rising at a high rate in many countries, including the world's

Authors' note: *Participants at the Asia Economic Policy Conference and especially discussant Ricardo Caballero offered helpful comments. Frank Smets and seminar participants at London Business School also contributed valuable suggestions. We thank Alexandra Altman and Matteo Maggiori for outstanding research assistance. Financial support was provided by the Coleman Fung Risk Management Center at the University of California, Berkeley.*

largest economy, the United States. Second, a number of countries were simultaneously running high and rising current account deficits, including the world's largest economy, the United States. Third, leverage had built up to extraordinary levels in many sectors across the globe, notably among consumers in the United States and Britain and financial entities in many countries. Indeed, we ourselves began pointing to the potential risks of the "global imbalances" in a series of papers beginning in 2001.¹ As we will argue, the global imbalances did not cause the leverage and housing bubbles, but they were a critically important codeterminant.

In addition to being the world's largest economy, the United States had the world's highest rate of private homeownership and the world's deepest, most dynamic financial markets. And those markets, having been progressively deregulated since the 1970s, were confronted by a particularly fragmented and ineffective system of government prudential oversight. This mix of ingredients, as we now know, was deadly.

Controversy remains about the precise connection between global imbalances and the global financial meltdown. Some commentators argue that external imbalances had little or nothing to do with the crisis, which instead was the result of financial regulatory failures and policy errors, mainly on the part of the U.S. Others put forward various mechanisms through which global imbalances are claimed to have played a prime role in causing the financial collapse. Former U.S. Treasury Secretary Henry Paulson argued, for example, that the high savings of China, oil exporters, and other surplus countries depressed global real interest rates, leading investors to scramble for yield and underprice risk.²

We too believe that the global imbalances and the financial crisis are intimately connected, but we take a more nuanced stance on the nature of the connections. In our view, both originated primarily in economic policies followed in a number of countries in the 2000s (including the United States) and in distortions that influenced the transmission of these policies through U.S. and ultimately through global financial markets.

The United States' ability to finance macroeconomic imbalances through easy foreign borrowing allowed it to postpone tough policy choices (something that was of course true in many other deficit countries as well). Foreign banks' appetite for assets that turned out to be toxic provided one ready source of external funding for the U.S. deficit. Not only was the U.S. able to borrow in dollars at nominal interest rates kept low by a loose monetary policy. Also, until around the autumn of 2008, exchange rate and other asset-price movements kept U.S. net foreign liabilities growing at a rate far below the cumulative U.S. current account deficit.

At the same time, countries with current account surpluses faced minimal pressures to adjust. China's ability to sterilize the immense reserve purchases it placed in U.S. markets allowed it to maintain an undervalued currency and defer rebalancing its own economy. Complementary policy distortions therefore kept China artificially far from its lower autarky interest rate and the U.S. artificially far from its higher autarky interest rate. Had seemingly low-cost postponement options not been available, the subsequent crisis might well have been mitigated, if not contained.³

We certainly do not agree with the many commentators and scholars who argue that the global imbalances were an essentially benign phenomenon, a natural and inevitable corollary of backward financial development in emerging markets. These commentators, including Cooper (2007) and Dooley, Folkerts-Landau, and Garber (2005), as well as Caballero, Farhi, and Gourinchas (2008a) and Mendoza, Quadrini, and Rios-Rull (2007), advanced frameworks in which the global imbalances were essentially a "win-win" phenomenon, with developing countries' residents (including governments) enjoying safety and liquidity for their savings, while rich countries (especially the dollar-issuing United States) benefited from easier borrowing terms.⁴ The fundamental flaw in these analyses, of course, was the assumption that advanced-country capital markets, especially those of the United States, were fundamentally perfect, and so able to take on ever-increasing leverage without risk. In our 2001 paper we ourselves underscored this point, identifying the rapid evolution of financial markets as posing new, untested hazards that might be triggered by a rapid change in the underlying equilibrium.⁵

Bini Smaghi's (2008) assessment thus seems exactly right to us: "[E]xternal imbalances are often a reflection, and even a prediction, of internal imbalances. [E]conomic policies . . . should not ignore external imbalances and just assume that they will sort themselves out."⁶ In this paper we describe how the global imbalances of the 2000s both reflected and magnified the ultimate causal factors behind the recent financial crisis. At the end, we identify policy lessons learned. In effect, the global imbalances posed stress tests for weaknesses in the United States, British, and other advanced-country financial and political systems—tests that those systems did not pass.

2. World Policymakers React to Growing Imbalances

Between 1989 and 1997, the U.S. current account deficit fluctuated in a range below 2 percent of GDP. In 1998, with the Asian financial crisis and its backwash in full swing, the deficit reached 2.4 percent of GDP, climbing to 4.8 percent by 2003. Driven largely by high investment during the late 1990s, the U.S. deficit

reflected low national saving by 2003. U.S. external borrowing was to climb to roughly 6 percent of GDP by 2005–06 before falling, gradually in 2007–08 and then more abruptly afterward. The International Monetary Fund's (IMF) October 2009 forecast was for U.S. deficits around 2.8 percent of GDP in 2009 and 2.2 percent in 2010, then rising back to around 2.9 percent by 2012. (In April 2010 the trade deficit forecast was raised to 3.3 percent for 2010 and to 3.5 percent for 2012.) These levels are roughly half those of 2005–06.

Official discussion of the risks posed by large global imbalances intensified in the fall of 2003 as G-7 officials pressured Japan and (verbally) China to reduce their intervention purchases of dollars. At the G-7 and International Monetary Fund meeting in Dubai in 2003, the United States also pledged to take steps to promote national saving, while Europe committed to raise productivity. Later, in February 2004, the G-7 finance ministers and central bank governors asserted clearly that, along with structural policies to enhance growth, “sound fiscal policies over the medium-term are key to addressing global current account imbalances.” Following the October 2004 G-7 meeting—which again noted the problem of imbalances—Governor Toshihiko Fukui (2009) of the Bank of Japan outlined potential hazards and asserted, “Policy makers cannot adopt benign neglect in this context.”⁷ Japan, of course, had ended its massive 2003–04 foreign exchange interventions in March 2004 and, as of this writing, has refrained from further intervention.

European policymakers likewise saw risks. The European Central Bank's (ECB) December 2004 *Financial Stability Review* stated, “Large and growing U.S. current account deficits have generally been perceived as posing a significant risk for global financial stability, at least since 2000.” The report worried that high levels of U.S. household mortgage borrowing implied risks of interest rate hikes and employment loss, risks that ultimately could affect banks and other creditors. Furthermore, the ECB noted, “A widening of the household sector deficit was a pattern not seen in earlier episodes of current account deficit widening.” In a presentation accompanying the press briefing for the *Financial Stability Review*, Tommaso Padoa-Schioppa flagged the U.S. external deficit and the rising price of oil as two main risks, and also mentioned the run-up in real estate values and in loan-value ratios in some euro zone countries. His general conclusion, however, was that risks to financial stability had “become less pronounced since late 2003,” in part because of strength in the real economy.^{8,9}

The Federal Reserve responded in sanguine terms. Alan Greenspan opined in February 2005 that “the U.S. current account deficit cannot widen forever but . . . fortunately, the increased flexibility of the American economy

will likely facilitate any adjustment without significant consequences to aggregate economic activity.”¹⁰ In his famous Sandridge Lecture of March 10, 2005, Ben Bernanke argued that the causes of the U.S. foreign deficit, and therefore its cures, were primarily external to the U.S. While not disagreeing with Greenspan’s expectation of a gradual, smooth adjustment process, Bernanke did note that “the risk of a disorderly adjustment in financial markets always exists, and the appropriately conservative approach for policymakers is to be on guard for any such developments.”¹¹ Unfortunately, U.S. politicians, financial regulators, and monetary authorities did not put serious weight on these risks.

Although it was not fully realized at the time, the world economy was indeed entering a new and more dangerous phase in 2004. Developments beginning in that year led to a further widening of global imbalances. At the same time, these very same developments planted the seeds of financial fragility both in the United States and Europe, with consequences that became evident only in the summer of 2007. While the factors driving the expansion of global imbalances starting in 2004 have their roots in policies of the immediately preceding years, some powerful propagation mechanisms hugely amplified the lagged effects of the policies.

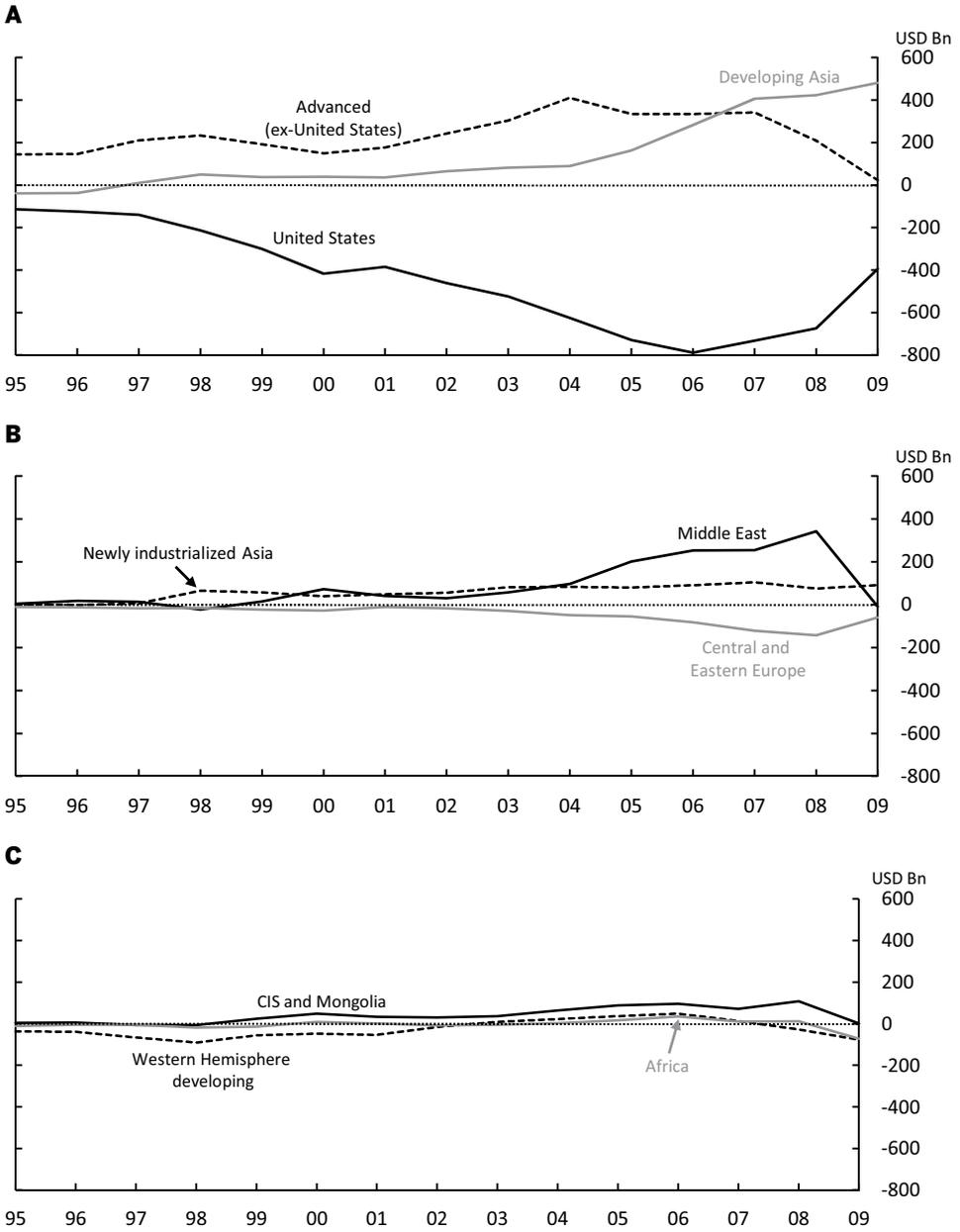
Thus, the first step in understanding the increasingly destabilizing forces driving global imbalances starting around 2004 is to return to the period following the Asian crisis—though as we shall see, the effects of the Asian crisis itself are only part of the story, and perhaps not even the most important part.

3. Global Imbalances: Mid-1990s through 2003

Current account configurations in the mid-1990s were on the whole unexceptional, as shown in the three panels of Figure 1. In 1995 developing Asia (which includes China) and the Western hemisphere countries had comparable deficits, and the countries of Central and Eastern Europe were also net borrowers on a smaller scale. Other regions were in surplus, with the mature economies as a group providing the main finance for the developing borrowers. True, in 1995 the United States was running a current account deficit that was large in absolute terms, but as a percentage of U.S. GDP it was about half the size of the Reagan-era deficits at their height (about 1.5 percent of GDP).¹²

Then, in 1997, the Asian crisis struck. Bernanke (2005) provided a particularly eloquent and concise summary of the influential view that the crisis contributed to a sequence of events and policy responses in emerging market economies that set the stage for the arrival of much larger global imbalances starting in the late 1990s.

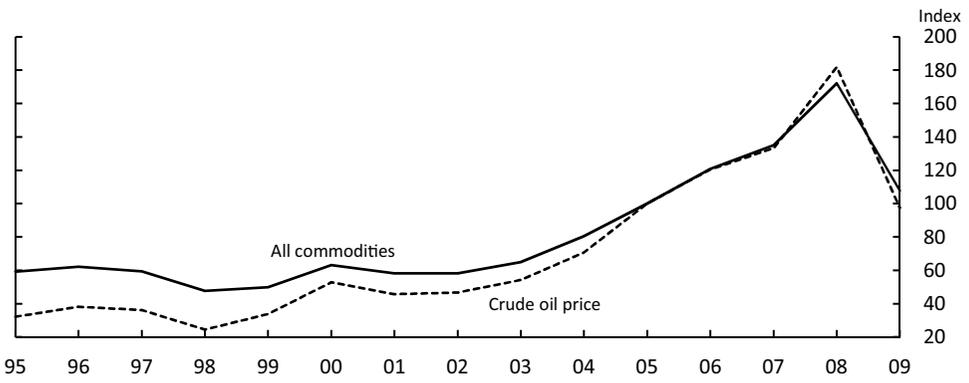
FIGURE 1
Global Imbalances, 1995–2009
 Current Account Surplus



The Asian turbulence began with Thailand’s currency crisis. Thailand had long maintained a fixed exchange rate of the baht against the U.S. dollar. Prior to 1996, when a previously torrid growth rate slowed markedly, rapid credit expansion within a liberalized financial system fueled bubbles in real estate and stocks. Ascending asset prices then reversed course, as the current account deficit reached nearly 8 percent of GDP. Fierce currency speculation against the baht broke out in May 1997, and the baht-dollar peg was broken in July. The crisis spread contagiously to other Asian countries, many of which had seemingly healthier fundamentals than Thailand’s. Under market pressure, however, weaknesses were revealed in a number of Asian banking systems. Most of the affected countries turned to the International Monetary Fund for support.

The harsh consequences of the crisis, and in particular the conditionality imposed by the IMF as the quid pro quo for financial assistance, left a bitter memory. Figure 1 shows that the developing Asian countries and the newly industrialized Asian group of Hong Kong, Korea, Singapore, and Taiwan, some of them with much weaker currencies than before the crisis, went into external surplus afterward. As the recessionary effects of the crisis dissipated and the dot-com boom reached a peak, global commodity prices rose (Figure 2), helping to generate bigger surpluses for the oil-producing Middle East and the Commonwealth of Independent States (CIS). The advanced economies as a group ran a correspondingly bigger deficit. As noted above, the U.S. deficit rose to 2.4 percent of GDP in 1998. It rose to 3.2 percent in 1999 and 4.3 percent in 2000, with only a slight reduction in 2001 (when the U.S. was briefly in recession) before rising further.

FIGURE 2
Global Commodity Prices
 2005 = 100



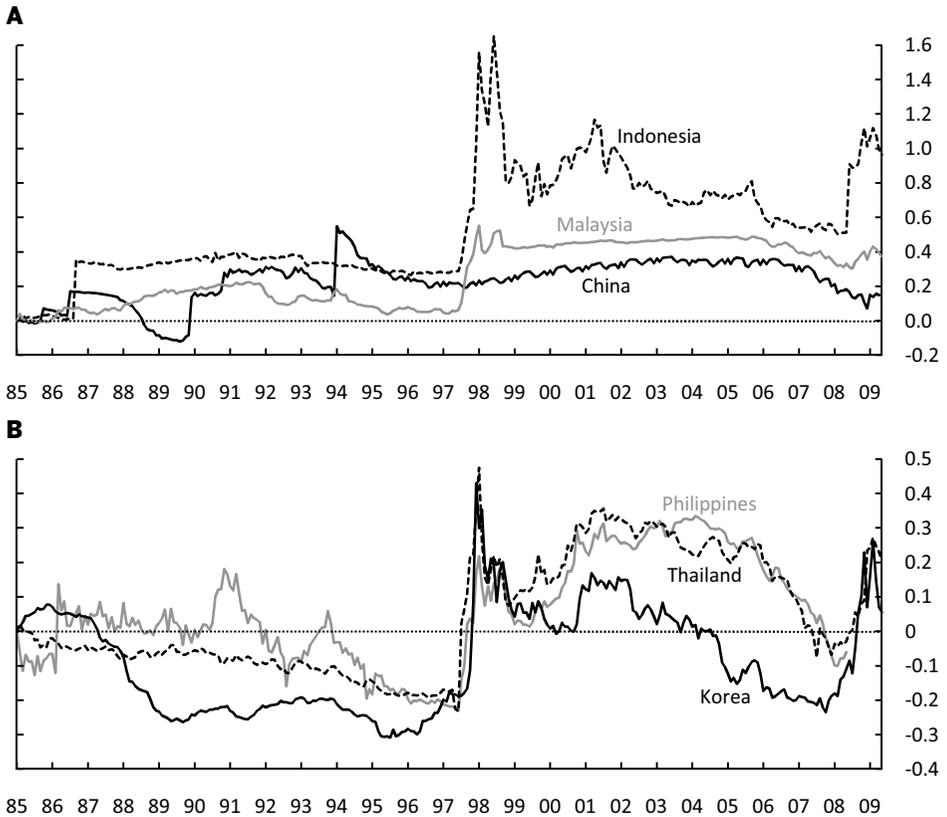
The surpluses of the Asian countries and oil producers proved to be persistent. In newly industrialized Asia, gross saving remained more or less at pre-crisis levels but investment declined. In developing Asia, saving returned to the pre-crisis level of around 33 percent of GDP only in 2002, from which level it continued to rise quickly (reaching a staggering 47 percent of GDP in 2007). Gross investment returned to the pre-crisis level of about 35 percent of GDP only in 2004, and while it continued to rise significantly thereafter, it did not rise as much as saving did. In time, investment in much of Asia did recover relative to saving, but developments in China outweighed this phenomenon. China accounted for slightly over half of developing Asia's aggregate external surplus in 2000, but accounted for virtually all of it by 2005. By then, China's imbalance, along with those of the oil exporting countries, had become a major counterpart of the global deficits.

Supporting these enhanced current account surpluses were exchange rate policies that tended to keep rates at competitive levels compared to the pre-crisis period. One motivation for foreign exchange intervention policies in Asia was to pursue export-led strategies for maintaining high economic growth rates. Another was to accumulate substantial stocks of international reserves as buffers against future financial crises that might otherwise force renewed dependence on the IMF. In the Middle East, countries such as Saudi Arabia maintained longstanding pegs to the U.S. dollar. Wolf (2008) offers an extensive discussion of how exchange rate policies in emerging markets supported the constellation of growing global imbalances through the 2000s.

The two panels of Figure 3 show bilateral real exchange rates against the U.S. dollar for six Asian countries, one of them (Korea) an Asian crisis graduate that is in the newly industrialized group. In the definitions used to construct this diagram, an upward movement is a real *depreciation* against the dollar. All countries remained at depreciated levels compared to 1997 for many years after the crisis. Indeed, in Figure 3, only the Korean won ever returns to its 1997 level. Intervention policies were associated with rapid growth in international reserves, as we have noted. During the closing years of the Bretton Woods system, speculation against the overvalued dollar contributed to worldwide growth in international reserves and eventually to higher global inflation. In the 2000s up until the autumn of 2008, reserve growth similarly caused inflationary pressures outside the U.S., also driving increases in commodity, housing, and other asset prices.

Figure 4 shows the evolution of international reserves for emerging and developing economies. In the developing and newly industrial Asian countries as a group, and particularly in China, reserve accumulation tended to outstrip

FIGURE 3
Real Exchange Rates of Selected Asian Currencies



Source: Authors' calculations based on Global Financial Data

even the growing current account surpluses as strong inward foreign direct investment (FDI) flows (and in China's case later on, hot money inflows) augmented balance of payments surpluses. In general, strong attempts were made to sterilize the incipient effects on Asian money supplies, so as to dampen inflationary pressures that might otherwise have eroded competitiveness (while simultaneously compromising macroeconomic stability). Figure 5 shows the stark contrast between the measured growth of China's monetary base and the explosion in its international reserves (expressed in renminbi). In contrast to China, Middle Eastern countries' reserves rose more slowly than overall net external assets, as a substantial portion of their surpluses flowed into investment vehicles other than liquid reserves.

FIGURE 4
Growth in Official Foreign Exchange Reserves
Annual Change

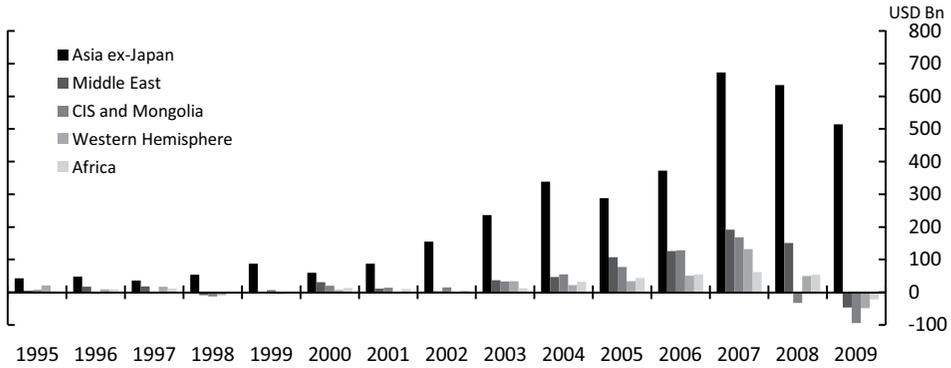
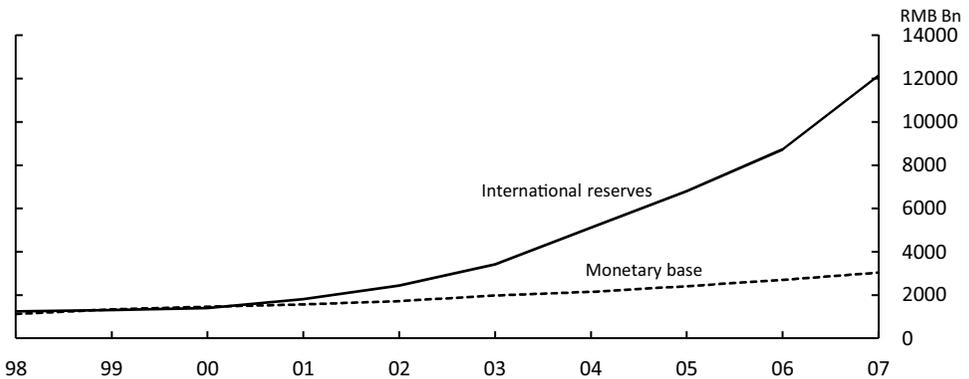


FIGURE 5
China's Monetary Base and International Reserves



Source: International Financial Statistics

In both cases, economic policies and market developments helped to generate significant current account surpluses, which in turn entailed rapid accumulation of public and private claims on industrial countries, in particular the United States. What economic adjustments elsewhere in the world allowed these emerging market surpluses, and the counterpart advanced-country deficits, to emerge as equilibrium phenomena?

Bernanke (2005) posits that an outward shift of emerging market saving schedules, both in Asian economies and in commodity exporters enriched by improved terms of trade, was the principal cause of the expansion of U.S.

external deficits starting in the latter 1990s. According to this theory, the advent of this “global saving glut” led to worldwide asset-price adjustments that induced a number of mature economies, most importantly that of the United States, to borrow more heavily from foreigners. While we believe that Bernanke’s story is incomplete in several important respects, it is useful nonetheless to review the outlines of his argument, especially as it provides a frame of reference for so many subsequent discussions.¹³

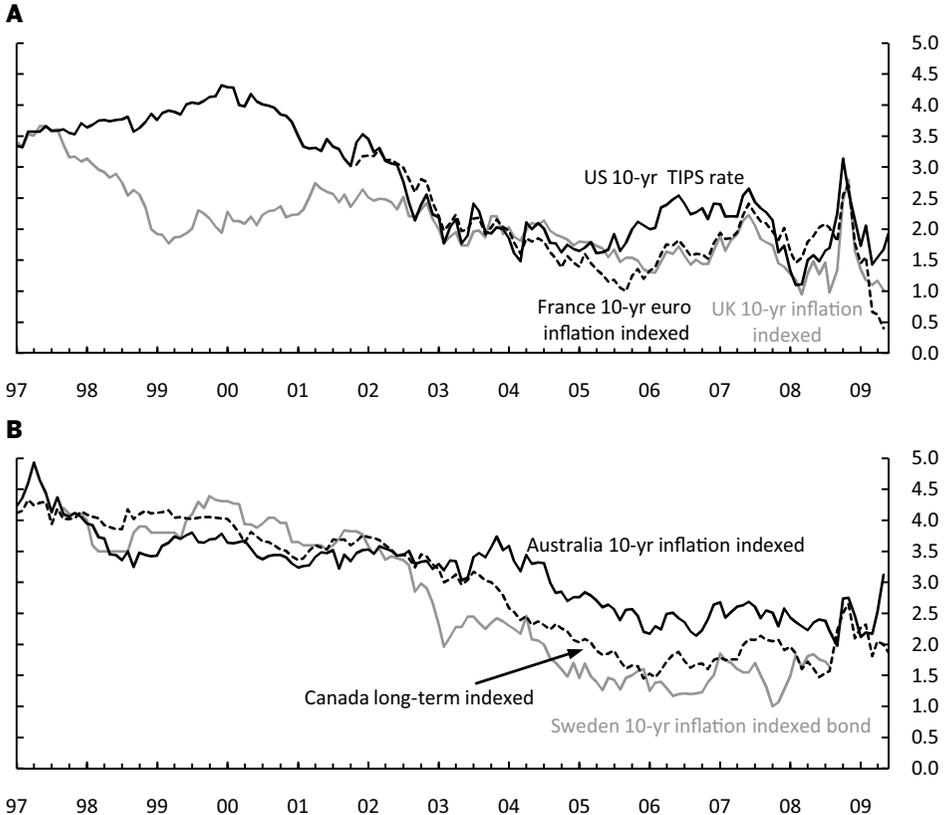
Bernanke divides the 1996–2004 period into two halves. In the first period, ending early in 2000, “equity prices played a key equilibrating role in international financial markets” (Bernanke 2005, p. 8). Financial capital from emerging market savers flowed into the U.S., “fueling large appreciations in stock prices and in the value of the dollar” and implying wealth and international competitiveness effects consistent with a larger U.S. deficit. At the same time, Bernanke argues, expectations of rapid future productivity growth in the United States encouraged investment and further discouraged saving. But he seems to view this second set of domestically generated causal factors as secondary in quantitative significance to the effects of increased emerging market saving. Thus Bernanke posits that the “global saving glut,” rather than particularly unusual factors in the United States, was the main driver of the imbalances. In particular, he assigns only a very minor role to monetary policy.

The period ending in early 2000 was not accompanied by falling real interest rates in the United States. For a sample of mature economies, Figure 6 shows interest rates on 10-year government inflation-indexed obligations, a market-based measure of the real interest rate. The United States Treasury inflation-protected securities (TIPS) rate rose mildly over the period ending in March 2000, and industrial country rates other than the United Kingdom’s do not diverge too far from the U.S. rate in those years.

Early 2000 marked the peak of the U.S. equity markets and the prelude to the dot-com collapse. Bernanke (2005, pp. 8–9) suggests that investment demand fell around the world as a result, yet with desired saving still high, he argues, real interest rates had to decline. As a result, “low real interest rates rather than high stock prices became a principal cause of lower U.S. saving.”

The U.S. real interest rate indeed shows a remarkable coherence with the U.S. equity markets, as illustrated in Figure 7. Both the equity markets and the real interest rate peaked in the period between February and October 2000, and then both began to decline sharply. Real long-term interest rates outside the U.S. also fell (Figure 6). The fall in equity values starting in 2000 could have been caused by a perception of lower future productivity, hence a reduced marginal productivity of capital. (Neither the size of the sharp run-up in equity

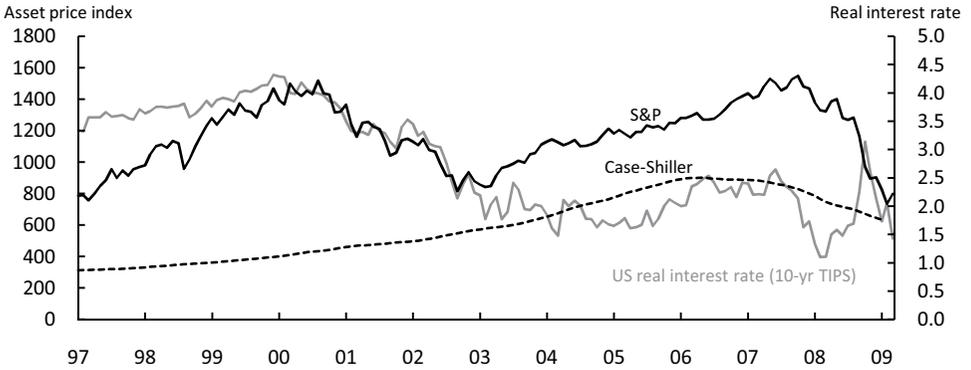
FIGURE 6
Long-Term Real Interest Rates



Source: Global Financial Data

prices to March 2000 nor the timing of their subsequent fall is easily rationalizable in terms of standard economic theory.) In any case, the data do not support a claim that the proximate cause of the fall in global real interest rates starting in 2000 was a contemporaneous increase in desired global saving (an outward shift of the world saving schedule). Indeed, according to IMF data, global saving (like global investment, of course), fell between 2000 and 2002 by about 1.8 percent of world GDP; aggregate global saving rose only later in the decade. If anything, the fall in real interest rates is more closely related to the global decline of the high-tech sector, which in the U.S. was a main driver of the foreign deficit during the 1990s. To restate this important point, market perceptions that the tech-driven productivity boom of the 1990s had ended, not the rise

FIGURE 7
Nominal U.S. Asset Prices and Real Interest Rate



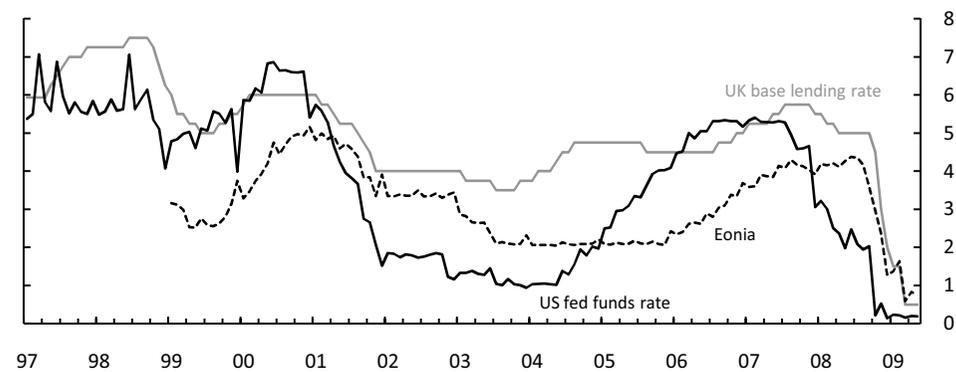
Sources: Standard and Poor's and Global Financial Data

in global saving that occurred only later in the 2000s, is a more plausible explanation of the general level of low real interest rates at the decade's start.¹⁴

The fall in long-term interest rates brought down mortgage rates in the U.S. (and elsewhere in the world), with powerful effects on real estate markets. Home prices had been rising steadily in the U.S. since the mid-1990s; they began to rise more rapidly.¹⁵ Given the wide extent of homeownership in the U.S. and the relative ease, compared to other countries, of borrowing against housing equity, faster home appreciation reduced saving sharply and had an especially strong effect on the U.S. deficit, as argued by Bernanke. In most emerging markets, with much less developed financial markets, tighter borrowing constraints, and more restricted asset ownership, we would expect such asset-price effects on saving to be much weaker. For surplus countries, moreover, the conventional substitution effect on saving of lower world real interest rates was opposed by an intertemporal terms of trade effect. But in the U.S. these effects reinforced each other (Obstfeld and Rogoff 1996). Residential investment rose along with real estate prices, adding a further impetus to deficits in countries with housing price booms.

While global factors have clearly been important for long-term real interest rates, short-term nominal interest rates are controlled by central banks. In the United States, the Federal Reserve had been allowing the federal funds rate to rise since early 2000, reaching a target rate of 6.5 percent in May of that year (see Figure 8). Perceiving rapidly accelerating weakness in the economy after the high-tech collapse, the Federal Open Market Committee (FOMC) initiated

FIGURE 8
Policy Interest Rates



Source: Global Financial Data

a loosening cycle after a telephone conference on January 3, 2001. The FOMC cut the federal funds rate by 50 basis points immediately and then by a further 50 basis points at its next regularly scheduled meeting four weeks later. By the end of August 2001 the target rate stood at 3.5 percent. Further sharp cuts followed the 9/11 attacks, however, and at the end of 2001 the rate stood at 1.75 percent. The rate was reduced further through 2002 and 2003, finally reaching a level of only 1 percent in June 2003. As argued by the Bank for International Settlements (2009, p. 6), the dollar's vehicle-currency role in the world economy makes it plausible that U.S. monetary ease had an effect on global credit conditions more than proportionate to the U.S. economy's size.

In early 2003 concern over economic uncertainties related to the Iraq war played a dominant role in the FOMC's thinking, whereas in August, the FOMC stated for the first time that "the risk of inflation becoming undesirably low is likely to be the predominant concern for the foreseeable future. In these circumstances, the Committee believes that policy accommodation can be maintained for a considerable period."¹⁶ Deflation was viewed as a real threat, especially in view of Japan's concurrent struggle with actual deflation, and the Fed intended to fight it by promising to maintain interest rates at low levels over a long period. The Fed did not increase its target rate until nearly a year later. Other major central banks were also cutting their policy rates during the 2001–03 period, although not as sharply as the Fed did (Figure 8). The Bank of Japan (not included in Figure 8) had been following a zero interest rate policy since February 1999, with only a brief (but somewhat disastrous) interruption,

and it reaffirmed that policy in March 2001. As Figure 7 makes clear, another U.S. stock market boom had started by the spring of 2003.

Coupled with low long-term real interest rates, the accommodative stance of monetary policy, particularly U.S. monetary policy, played a key role in the expansion of both housing market excesses and the global imbalances starting in 2004. Among other critics of the Fed, John B. Taylor (2009) has argued that the central bank adopted an overly accommodative stance starting in 2001 and maintained it for much too long.¹⁷ That policy accommodation, according to him, helped propel house prices and residential investment upward.¹⁸ Of course, as we document later, many countries outside the U.S. likewise experienced rapid housing appreciation during the 2000s, typically accompanied by growing current account deficits. Many (but not all) of these countries were running relatively loose monetary policies, policies seemingly justified by the absence of an imminent inflation threat. We agree with Taylor that U.S. monetary ease was important in promoting the U.S. deficit and setting the stage for the crisis. We argue, however, that it was the interaction among the Fed's monetary stance, global real interest rates, credit market distortions, and financial innovation that created the toxic mix of conditions making the U.S. the epicenter of the global financial crisis. Given the regulatory weaknesses outside the U.S. and competitive pressures in the banking industry, financial globalization ensured that the crisis quickly spread abroad, even to some countries with current account surpluses.

4. Global Imbalances: 2004 through 2008

During 2004 the global economic landscape evolved in a number of respects as global imbalances generally widened under the pressure of continuing increases in housing and equity prices. Three key interlocking causes of the widening were related to China's external position and exchange rate policies, the escalation of global commodity prices, and an acceleration of financial innovation in the U.S. and in European banks' demand for U.S. structured financial products.

The ways in which these seemingly unrelated developments might interact were certainly far from obvious at the time, yet by 2004 some policymakers were becoming nervous about the ongoing effects of low policy interest rates, with inflation as well as financial instability viewed as potential threats down the road. The minutes of the FOMC's March 2004 meeting stated that:

Some members, while supporting an unchanged policy at this meeting, nonetheless emphasized that the maintenance of a very accommodative monetary policy over an extended period in concert with

*a stimulative fiscal policy called for careful attention to the possible emergence of inflationary pressures. And, while adjustments in financial markets to low rates had generally been consistent with the usual operation of the monetary transmission mechanism, some members were concerned that keeping monetary policy stimulative for so long might be encouraging increased leverage and excessive risk-taking. Such developments could heighten the potential for the emergence of financial and economic instability when policy tightening proved necessary in the future.*¹⁹

Perceiving increasing upward pressure on prices, the FOMC embarked on a tightening cycle at the end of June 2004, initially raising the target federal funds rate from 1 to 1¼ percent. By November 2004 the target stood at 2 percent; from there it would rise (in a regular sequence of small moves) to a peak of 5¼ percent by July 2006 (see Figure 8).

The ECB also perceived risks. Late in 2004, Jean-Claude Trichet noted:

The shorter-term dynamics of M3 growth have strengthened over recent months. This seems very much related to the low level of interest rates in the euro area.

This very low level of interest rates also fuels private sector demand for credit. In particular, the demand for loans for house purchases is strong, supported by strong house price dynamics in several euro area countries. The growth in loans to non-financial corporations has also picked up over recent months.

*As a result of the persistently strong growth in M3 over the past few years, there remains substantially more liquidity in the euro area than is needed to finance non-inflationary growth. This could pose risks to price stability over the medium term. In addition, persistently high excess liquidity and strong credit growth could also become a source of unsustainable asset price increases, particularly in property markets. Such developments need to be monitored carefully.*²⁰

Yet the ECB maintained its own policy rate unchanged at 2 percent for another year. The rate would slowly rise to 4¼ percent by July 2007 (Figure 8).²¹

In retrospect a number of interrelated macroeconomic developments were in train in different parts of the world, even as the two most powerful central banks gingerly backed away from their highly accommodative stances.

One set of major repercussions on the global equilibrium emanated from China. China's real GDP growth had accelerated since the Asian crisis,

averaging slightly above 10 percent per year over the 2003–05 period, then rising to 11.6 percent in 2006 and 13 percent in 2007. Accompanying this more rapid growth was a sharply growing external surplus—China’s current account surplus jumped from 3.6 percent of GDP in 2004 to 7.2 percent in 2005, and had risen to a staggering 11 percent of GDP by 2007. As of 2004, moreover, Chinese authorities were intervening to maintain a rigid peg of the renminbi against the U.S. dollar. China’s export success—in the mid-2000s it was on track to overtake Germany as the world’s premier exporter—fueled both the country’s rapid growth rate and strong protectionist sentiment in destination markets.

Perhaps even more remarkable than China’s trade surplus was the huge size of the underlying saving and investment flows that generated it. China’s gross investment rate grew inexorably during the 2000s, reaching over 45 percent at the time of the crisis. But its saving rate grew even faster. Whereas in earlier years, China’s high saving had been fueled by the household sector (due to a mix of financial repression and a weak social safety net), during the 2000s, the booming Chinese corporate sector accounted for close to half of overall Chinese saving.²²

The years since the late 1990s had seen China’s accession to the World Trade Organization as well as a major reorientation of trade within Asia, with China becoming a major re-export center. In particular, many Japanese exports that had previously flowed directly to the United States, making Japan the leading target for U.S. trade pressure through the mid-1990s at least, now flowed to China for re-export to the U.S. Along with China’s overall current account surplus, its bilateral surplus with the United States (and slightly later, its surplus with the European Union) rose sharply as well in the early 2000s (see Figure 9). With an election looming in 2004, sentiment to label China as a “currency manipulator” intensified in the U.S. Congress, culminating in the real threat of punitive trade legislation in 2005. China gained a temporary reprieve by slightly revaluing the renminbi in July 2005 and embarking on a gradual appreciation process against the dollar that lasted until the summer of 2008.

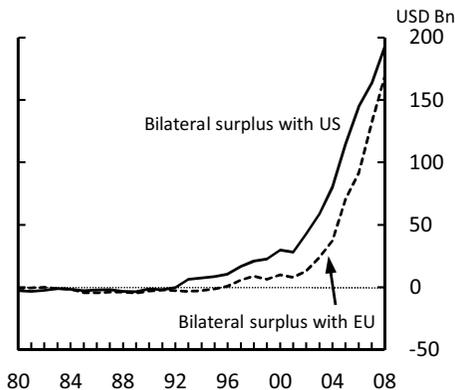
An undervalued renminbi peg subject to external political pressure attracted a torrent of hot money, despite the Chinese government’s efforts to exclude financial inflows and encourage outflows. These trades were especially attractive to speculators because U.S. and European interest rates remained relatively low. Normally such a process would spark inflation as in Germany and other U.S. trade partners at the end of the Bretton Woods period, leading to *real* currency appreciation. Through aggressive sterilization and other measures, however, China restrained inflation as well as the consumption boom that would have driven prices higher. Output grew at an increasing rate, as did the

country's current account surplus and its holdings of international reserves (see Figure 5). Of course, a number of other emerging markets intervened to discourage real appreciation against the dollar, all the while accumulating reserves and battling the resulting upward pressure on prices (see Figure 3).

Had the natural "Humean" international adjustment process been allowed to function earlier on, rather than a combination of undervaluation and expenditure compression policies, the dollar would have been weaker in real effective terms, there would have been more upward pressure on world real interest rates, and the U.S. external deficit would likely have been smaller. The Federal Reserve and ECB might have been induced to raise interest rates earlier and more sharply.

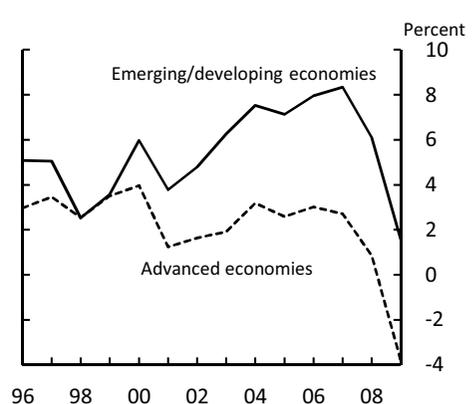
The policies and performance of China and some other emerging markets were not alone in adding to the world supply of excess savings. Commodity exporters were another important source. Under the influence of monetary accommodation, low real interest rates, and the emerging (and indeed advanced) world's accelerating economic growth, commodity prices—notably the price of oil—began to rise at an increasing pace (see Figure 10 for real GDP growth rates and Figure 2 for commodity prices). An immediate effect, familiar from past episodes of commodity-price boom, was a big increase in the current account surpluses of commodity exporters.²³ Figure 1 shows the growing external surpluses of the Middle East and other developing commodity exporters—as well as China's growing surplus—starting in 2004.²⁴

FIGURE 9
China's Trade Surpluses with United States and European Union



Source: IMF, *Direction of Trade Statistics*

FIGURE 10
Annual Growth Rates of Real GDP

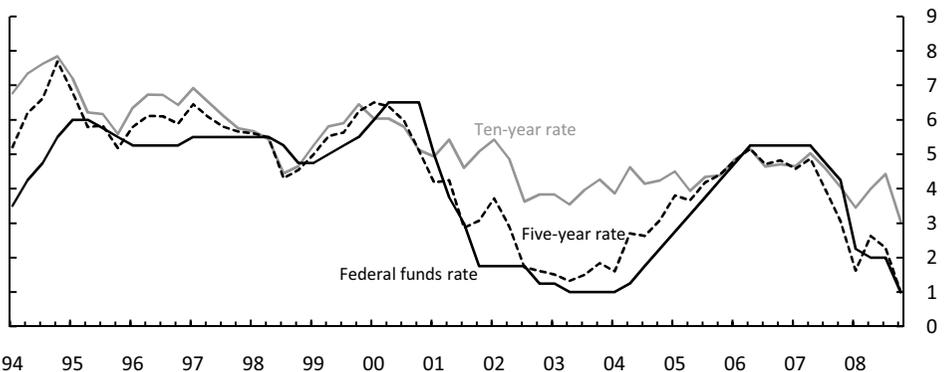


Other countries had to absorb these flows of excess savings. What increased deficits in the world economy corresponded to the higher surpluses of China and the commodity exporters? As Figure 1 also shows, the overall surplus of advanced countries other than the United States, which had been rising quickly prior to 2004, peaked in that year and then declined. The deficit of the United States continued to rise through 2006. As a result, the *overall* deficit of the advanced countries rose dramatically after 2004, with Eastern Europe's deficits adding to the total world demand for excess savings. In part this increased deficit reflected the higher cost of commodity imports, but as we argue later, that was only part of the story.

IMF data on the global saving rate show overall world saving to be increasing over this period. World gross saving averaged 22.6 percent of global output in 1987–94 and 22.0 percent in 1995–2002. But from 2003 through 2007 the annual numbers rise steadily from 20.9 percent to 24.4 percent. Evidently, increased saving by commodity exporters and developing Asia outweighed decreased saving elsewhere in the world economy.

This increase in world saving may help explain why long-term global real interest rates remained relatively low (Figure 6), as did nominal long-term rates (Figure 11), despite a shift toward monetary tightening in industrial countries starting in 2004 (Figure 8). Of course, world saving and investment must be equal in principle, but an interpretation of the data as being driven by an exogenous increase in investment demand seems inconsistent with the failure of long-term real interest rates to rise to anywhere near late 1990s levels in the mid-2000s.²⁵

FIGURE 11
Term Structure of U.S. Interest Rates



Source: Board of Governors of the Federal Reserve System

We emphasize that this increase in global saving starting in 2004 plays out largely *after* the period Bernanke (2005) discussed in his “saving glut” speech, and arguably was triggered by factors including low policy interest rates. In our view, the dot-com crash along with its effects on investment demand, coupled with the resulting extended period of monetary ease, led to the low long-term real interest rates at the start of the 2000s. However, monetary ease itself helped set off the rise in world saving and the expanding global imbalances that emerged later in the decade. Indeed, it is only around 2004 that the idea of a global saving glut (as opposed to a global dearth of investment) becomes most plausible.

A further factor contributing to lower interest rates in the United States in particular was the rapid pace of dollar reserve accumulation by emerging and developing countries, which also accelerated in 2004 (Figure 4). Estimates by Krishnamurthy and Vissing-Jorgensen (2008) and Warnock and Warnock (2009) suggest that official foreign demand for U.S. government debt depressed long-term Treasury yields by at least 50 basis points. Partial-equilibrium estimates, however, almost certainly overstate the general-equilibrium yield effects of diversification out of dollars by official reserve holders. While the true magnitude is probably secondary to the effects of global saving flows and monetary policy, reserve accumulation nonetheless contributed something to the compression of yields in U.S. financial markets.

In principle, a country with a currency peg and running a current account surplus need not simultaneously have a surplus in its balance of payments.²⁶ In other words, it need *not* be building up foreign exchange reserves. Indeed, the flow of net purchases of claims on rich countries by developing-country private residents expanded dramatically over the 2000s up until the crisis; and if the capital account is open to financial outflows, the central bank can reduce its reserves at a given exchange rate by purchasing domestic assets. In practice for emerging markets, financial outflows are not completely frictionless, but it also seems clear that in many cases countries purposefully accumulated reserves as a precaution against internal or external financial crises.²⁷ Emerging market borrowing spreads fell to very low levels in the mid-2000s as investors in richer countries searched for higher yields, and the resulting financial inflows, magnified by interventions meant to slow appreciation against the dollar, led to further increases in foreign exchange reserves. Higher reserve war chests contributed in turn to the perception of increased safety.

China, with a relatively restricted capital account and a tightly managed (albeit adjustable) exchange rate peg, had less flexibility than countries with better developed and more open financial markets to put a brake on reserve

acquisition. It also was (and remains) the largest buyer of dollar reserves. Although the Chinese authorities undertook opportunistic financial outflow liberalizations in an attempt to reduce balance of payments inflow pressures, the combination of a growing current account surplus, strong inward FDI, and hot money inflows in response to expected appreciation spelled massive growth in foreign exchange reserves, as we have noted.²⁸

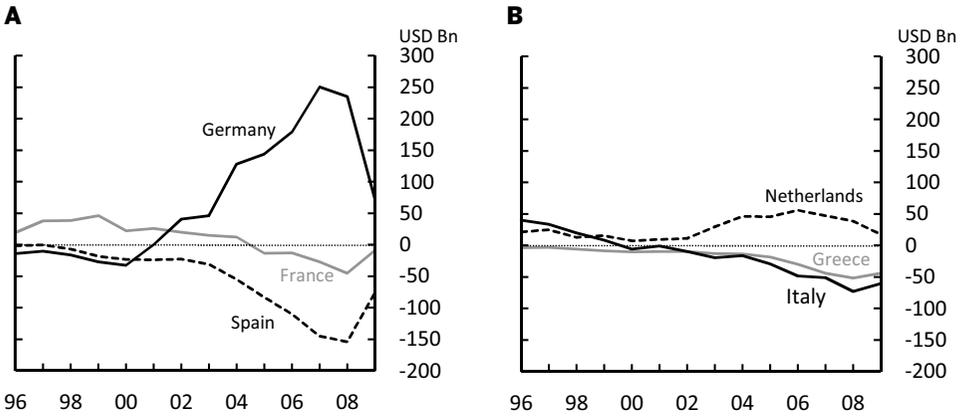
Holding the bulk of reserves in dollars rather than, say, euros was a matter of pure choice, however, motivated by the liquidity of U.S. bond markets and the dollar's dominant vehicle-currency position in world trade and finance. A country pegging its currency to the dollar need not hold dollar reserves at all, as it can maintain an unchanged domestic monetary stance while selling any dollars it acquires for a nondollar foreign currency. Most official emerging market reserve holdings were held in dollars nonetheless.

Within the group of advanced countries, as noted above, the two current account developments that stand out starting in 2004 are the sharp increase in the U.S. external deficit and a halt in the earlier trend of increasing surpluses for the aggregate of other advanced economies, including the euro zone. Fueling the higher overall deficit of the advanced-country group was (along with higher commodity import prices) equity market appreciation and, more powerfully, an acceleration in real estate appreciation and real estate investment.²⁹ The euro zone itself, wherein the ECB set a single interest rate for a diverse set of national economies, presented a microcosm of the divergence in current account positions concurrently taking place on a global scale. Starting in 2004, the German external surplus rose sharply, but was offset by increasing deficits for a number of other member countries such as Italy, Greece, and, especially, Spain (Figure 12).

In the United States, low interest rates fed into a powerful multiplier mechanism based on unrealistic expectations, asset-market distortions, and agency problems, notably in markets for housing finance. The resulting asset appreciation, especially housing appreciation, was a major driver of high consumer spending and borrowing. Home prices in the U.S. had been rising steadily for nearly a decade. Starting in March 1997, the Case-Shiller 10-city home price index declined in only two months before July 2006—in November 1998 and December 2001, and in those cases by very small amounts. Thus, neither the Asian crisis and its aftermath nor the dot-com crash and ensuing recession did much to dent the upward trend in U.S. home prices.

Entrenched expectations of housing appreciation interacted with low interest rates and financial innovation to push home prices up even more rapidly after 2003. The stock of mortgage debt expanded rapidly, as did residential

FIGURE 12
Selected Euro Zone Current Accounts

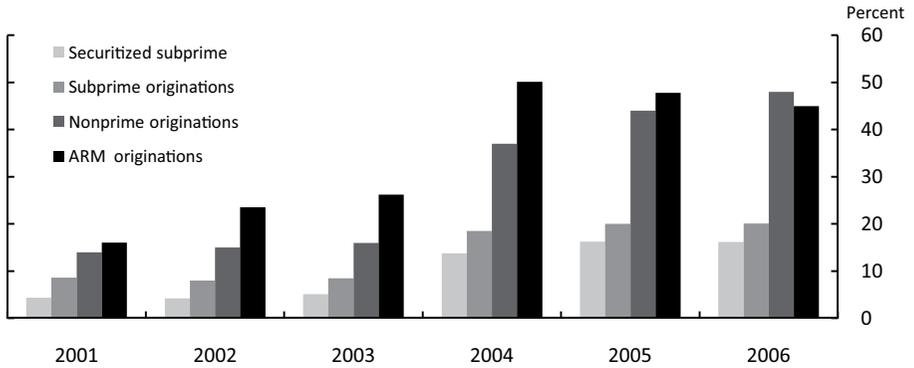


investment, while at the same time, mortgage quality in the U.S. deteriorated. Figure 13 shows how subprime and nonprime mortgage originations more generally jumped up in 2004. At the same time, the share of subprime originations being securitized increased until it reached over 80 percent in 2005 and 2006. In the low interest rate environment, the share of adjustable-rate mortgages (ARMs) also rose. As has often been noted, these loans were designed to refinance or default when the interest rate reset, but the refinance contingency was predicated on the assumption that home prices would not fall. Figure 14 shows the rapid growth of residential investment and mortgage debt outstanding (both expressed as shares of GDP, with the mortgage debt series covering commercial as well as family-owned properties). U.S. home prices rose at double-digit rates in 2004 and 2005, while the stock of mortgage debt pulled even with total annual U.S. GDP in 2006.

Low nominal short-term U.S. interest rates, and the expectation that rates would rise only at a measured pace, encouraged the proliferation of ARMs. At the same time, low nominal rates and the low-inflation environment, in and of themselves, eased credit constraints. At higher inflation rates, the monthly nominal interest payment in part reflects real amortization of the loan, which places an additional strain on the borrower's cash flow. Of course, the evidence indicates that mortgage lending standards in the U.S. deteriorated far beyond what any prudent assessment of borrowers' repayment prospects would suggest.

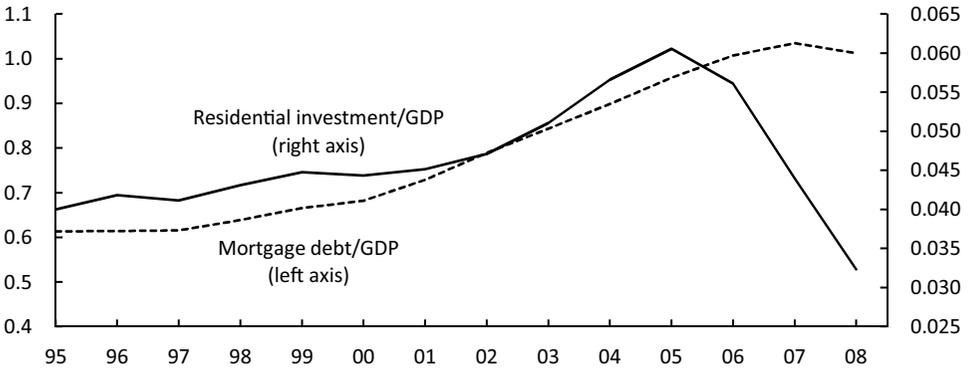
As many commentators have noted, the process was fed by wider financial innovation that repackaged mortgages (as well as other forms of debt, including consumer debt) into structured products endowed with very high levels of

FIGURE 13
Nonprime and Subprime Mortgage Originations
 Percent of Total Originations



Source: Jaffee et al. (2009)

FIGURE 14
U.S. Mortgage Debt and Residential Investment



Sources: Board of Governors of the Federal Reserve System and U.S. Department of Commerce

systemic risk—what Coval, Jurek, and Stafford (2009) have aptly labeled as “economic catastrophe bonds.” These products began to proliferate in the mid-2000s. For example, collateralized debt obligation (CDO) issuance started to rise markedly in 2004, as indicated by figure 10.2 in Acharya et al. (2009, p. 238); or see figure 3 in Blundell-Wignall and Atkinson (2008). Rajan (2006) suggests mechanisms through which low interest rates might promote such financial innovation, as well as more risk taking. Hoping to reduce their required regulatory capital under the Basel II framework, European banks eagerly acquired AAA-rated (but systemically risky and opaque) structured products.³⁰

Such regulatory arbitrage was one factor underlying the sharp increase in gross industrial-country external assets and liabilities documented by Lane and Milesi-Ferretti (2007) for the 2000s; see Figure 15, which shows some of their updated data series. In many cases, for example, European banks funded their dollar positions in U.S. structured products with dollars obtained through repo deals with U.S. money market mutual funds.³¹ Such socially unproductive gross flows into (and out of) the U.S. could of course have taken place even if the U.S. current account had been in surplus at the time.

The role of the U.S. *net* external deficit, in our view, was to enable a constellation of interest rates and asset prices consistent with apparently low inflation but simultaneously conducive to housing appreciation, lax mortgage lending practices, overall credit expansion, and strong incentives toward high leverage and regulatory arbitrage.³² These market dynamics created a vicious circle in which the expectation of ongoing housing appreciation fed mortgage credit expansion, which in turn pushed housing prices higher (Mian and Sufi 2009). All the while, the U.S. current account deficit widened.

Housing appreciation was not limited to the United States, of course, though it was mainly financial innovators in the U.S. who built an inverted pyramid of leverage on the narrow fulcrum of ongoing domestic home-price appreciation. Over the 2000s, real estate prices rose even more rapidly in some European Union countries, in Eastern Europe, and elsewhere than in the United States. But the trend was not universal—house prices in Germany did not rise, while land prices in Japan fell in real terms. Certainly the high level of global liquidity, including the possibly global reach of U.S. monetary ease, contributed to the worldwide upward pressure on housing. An intriguing regularity is the negative unconditional correlation between current account surpluses and housing appreciation, illustrated in Figure 16 for a sample of 43 mature and emerging countries. The figure plots the change in the ratio of the current account to GDP over 2000–06 against cumulative real housing appreciation over the same period.³³ There is a clear negative relationship, in which greater appreciation is associated with bigger deficit increases. Figure 17 shows the same relationship for the advanced-country subsample.³⁴

The negative relationship in the figures likely reflects two-way causality. Housing appreciation fuels increased borrowing from abroad in several ways, whereas increased availability of foreign funds could ease domestic borrowing terms and encourage housing appreciation. In addition, the bivariate plots are silent on the influence of third variables. Aizenman and Jinjara (2009) regress real estate prices on the lagged current account and other control variables, including financial depth, the real interest rate, and urban population growth.

FIGURE 15
Gross External Assets and Liabilities, Selected Countries

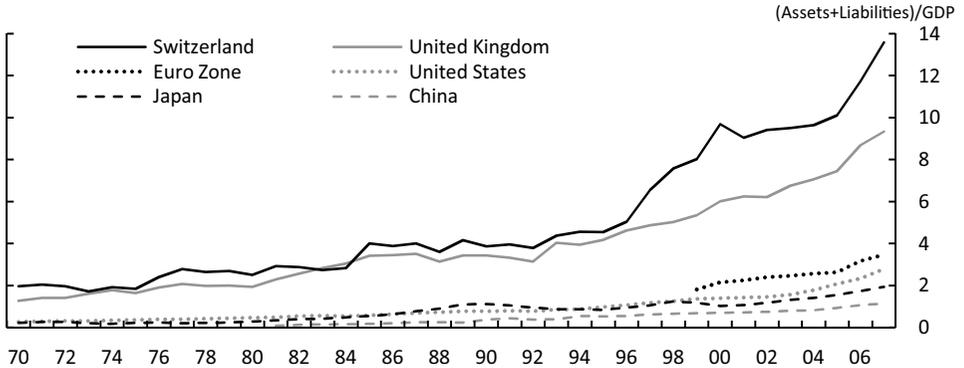


FIGURE 16
Real Estate Appreciation and Change in Current Account, 2000–06, All Countries

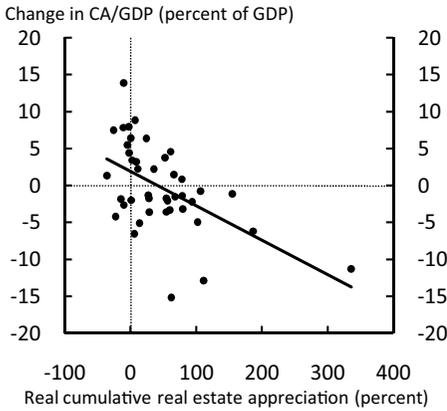
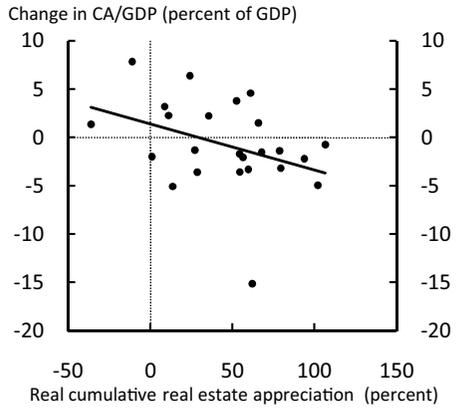


FIGURE 17
Real Estate Appreciation and Change in Current Account, 2000–06, Industrial Countries



Their baseline estimate suggests that a 1 percent of GDP increase in the current account deficit is associated with a 10 percent increase in real estate prices.³⁵ In many countries, easy lending conditions, including an influx of finance from foreign banks, helped to fuel housing booms. Similar capital inflow and real estate dynamics helped set the stage for the 1997–98 Asian crisis.³⁶

As the U.S. external deficit swelled after 2004, the Fed gradually raised the funds rate, as noted above. That rate peaked in the summer of 2006 (by which

time ECB and Bank of England policy rates were also on the rise; see Figure 8). The U.S. long-term real interest rate had also risen to a peak by then, and real long-term rates were rising in some other industrial countries (Figure 6). According to Federal Reserve data, the rate on 30-year, fixed-rate, conventional mortgages, having bottomed at 5.23 percent in June 2003, hit 6.76 percent in July 2006. U.S. housing appreciation stopped in late 2005 and 2006 and went mildly into reverse, although the stock market continued upward (Figure 6). Around this time 2/28 and 3/27 ARMs were resetting at sharply higher interest rates than when they were issued, straining or exceeding the payment capacities of many who had signed mortgage contracts two or three years before. Mayer et al. (2009) document how, starting in 2006, the share of nonprime housing loans with negative equity shot up, first in the Midwest, and then, much more rapidly, in California, Florida, Arizona, and Nevada. The stage was set for the more general financial crisis that finally erupted in August 2007.

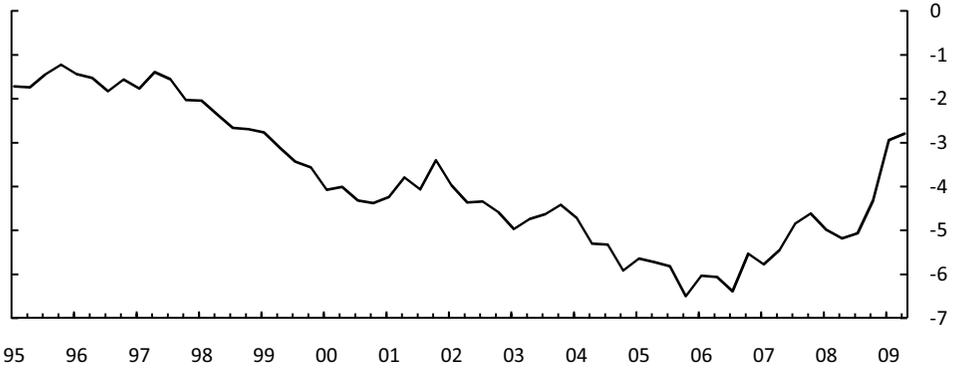
5. Global Imbalances in 2009 and Beyond

As we predicted in our earlier work, the decline in U.S. housing prices starting in 2006 set off a process of current account adjustment for the United States. In some respects, though, the process has been quite different from what we foresaw. Most notably, the dollar's foreign exchange value, while quite volatile since August 2007, has not collapsed. Financial instability spread globally from the United States, not due to the large and abrupt exchange rate movement that we feared, but because of international financial linkages among highly leveraged institutions as well as the global nature of the housing bust. The fragility of the international financial system was not well appreciated before the crisis. The magnitude of global imbalances up to 2008 both reflected that underlying fragility and allowed the system to become ever more fragile over time.

Figure 18 shows quarterly data on the U.S. current account balance, expressed as a percentage of GDP. Although the deficit has been on a declining trend since late in 2006, the decline starting in the latter part of 2008 is particularly dramatic. The IMF forecast as of April 2010 was that the U.S. external deficit would average somewhat above 3 percent of GDP over the following half-decade or so. This is a very significant adjustment relative to 2005–06. Nonetheless, that negative balance may well grow over time if U.S. monetary and fiscal policies remain accommodative. Indeed, as the ratio of U.S. public debt to GDP grows, it will become more difficult for the Fed to raise interest rates without creating significant additional fiscal tensions.

Figure 1 gives a sense of the global reconfiguration of global imbalances, measured in dollars. Alongside the sharply reduced deficit of the United States,

FIGURE 18
U.S. Current Account
 Percent of GDP; Quarterly Data



Source: U.S. Department of Commerce

the surpluses of the other advanced countries and of the oil-exporting CIS and Middle East have fallen dramatically. Newly industrialized Asia has maintained its surplus, while that of developing Asia (largely due to China) has continued upward.

Reduction of a current account deficit always entails a medium-term real currency depreciation (while appreciation is needed when a surplus falls). The required compression of relative domestic demand compared to relative domestic supply implies a fall in the relative price of domestic nontraded goods, as well as a terms of trade deterioration that lowers the prices of domestic tradables consumed intensively at home. This reasoning led us, in our earlier work on the U.S. current account, to predict significant real dollar depreciation from the level of 2004–05 (in some simulations, 30 percent or more) as a result of a disappearing U.S. deficit.

Figure 19 illustrates the dollar's evolution in real multilateral terms since the start of 1995. Over brief spans of time, exchange rates can move far away from long-term equilibria because of developments in financial markets, such as changes in policy interest rates, expectations shifts, fluctuations in risk aversion, safe haven effects, and credit-market disruptions. Each of these short-term factors has played a role in recent years. To illustrate the forces at work, Table 1 reports numerical changes in the dollar's real exchange rate over different subperiods. (Changes are expressed in log points so as to be additive over time.)

FIGURE 19
Real Exchange Rate of the U.S. Dollar
 January 2004 = 100



Sources: International Monetary Fund and Board of Governors of the Federal Reserve System

TABLE 1
Movements in the Real Dollar Exchange Rate

Period	Percent Change
January 1995 – February 2002	20.3
February 2002 – January 2007	-16.2
January 2007 – April 2008	-11.5
April 2008 – March 2009	16.4
March 2009 – October 2009	-10.8

The large U.S. deficit's emergence starting in the late 1990s was marked by strong real dollar appreciation of more than 20 percent. Appreciation was propelled by booming investment, the Asian crisis, and the growing perception of a "Great Moderation." Under the pressure of very loose U.S. monetary policy after the dot-com crash and 9/11, however, the dollar depreciated by more than 16 percent from early 2002 through the start of 2007, with a significant (but temporary) reversal over 2005 as the Fed tightened. Through 2006, however, the U.S. current account deficit only widened as imports outstripped exports.

As the U.S. housing boom stopped and went into reverse, and as the external deficit began slowly to shrink, the dollar plummeted, falling by better than 11 percent between January 2007 and April 2008. But with the intensification of perceived financial instability in the spring of 2008, the dollar began to rise again, benefiting from a safe haven effect in the presence of a financial crisis that was truly global in scope rather than U.S.-specific. A second factor pushing

the dollar up was a global shortage of short-term dollar funding for foreign banks' long positions in illiquid (often toxic) U.S. assets.³⁷ These factors helped produce a 16 percent real dollar appreciation between April 2008 and March 2009, deepening the onset of the recession in the United States.

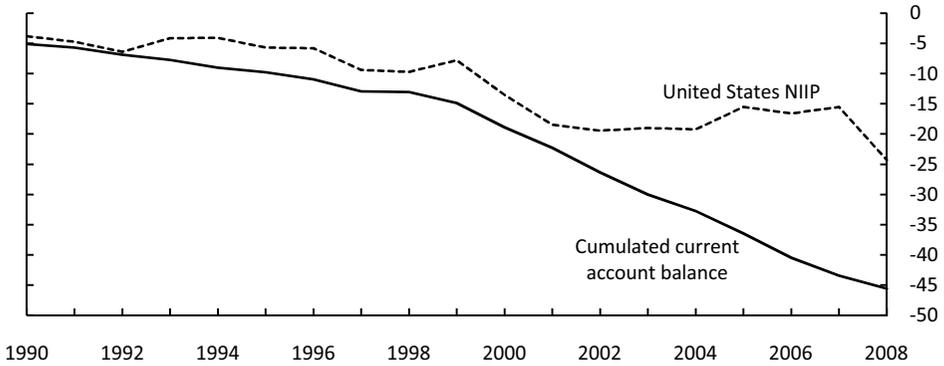
In the spring of 2009, the dollar resumed its descent, leaving its real exchange rate in October 2009 about 6 percent below its level of January 2007, shortly after the process of current account adjustment began. The dollar is likely to depreciate further as adjustment proceeds, although the process will be slower to the extent that major U.S. trading partners, notably China, resist the appreciation of their own currencies. (As of spring 2010, the process has also been slowed considerably by turmoil in the euro zone.)

Are today's somewhat compressed external imbalances still a problem? Perhaps one could hope that the current pattern is sustainable and will require little further adjustment. A number of considerations suggest, however, that global imbalances remain problematic, both for the U.S. and the world:

- The large private foreign purchases of U.S. assets that helped finance the U.S. deficit in past years contracted sharply after the Lehman collapse. Given the prospect of much larger U.S. public-sector deficits down the road, with no clear and credible timetable for their reduction, U.S. external borrowing will be prolonged and investor faith in the dollar cannot be taken for granted. Recent research on crises suggests several avenues of vulnerability as U.S. government deficits and debt grow, including self-fulfilling funding crises and currency collapses once fiscal fundamentals enter a danger zone. Given the multiple equilibria involved, the timing of such events is inherently impossible to predict. It is even conceivable, if the fiscal regime comes to be perceived as non-Ricardian and therefore not self-financing over time, that inflation expectations lose their customary monetary anchor, thereby making inflation control by the Fed more difficult.³⁸ In short, the prospect of dollar instability remains.
- In the past a combination of exchange rate and other asset price movements benefited the U.S. by bestowing capital gains on its external asset portfolio and losses on holders of U.S. external liabilities.³⁹ These gains and losses were not fully offset by differences in dividend and interest flows. As a result, the U.S. net external position did not keep pace with cumulated current account balances; in effect, the U.S. was borrowing at very low cost. That pattern has, however, swung into reverse. In 2008 the U.S. deficit was slightly over \$500 billion, whereas exchange rate changes and equity-market losses inflicted an additional loss of over \$800 billion on the net international investment position

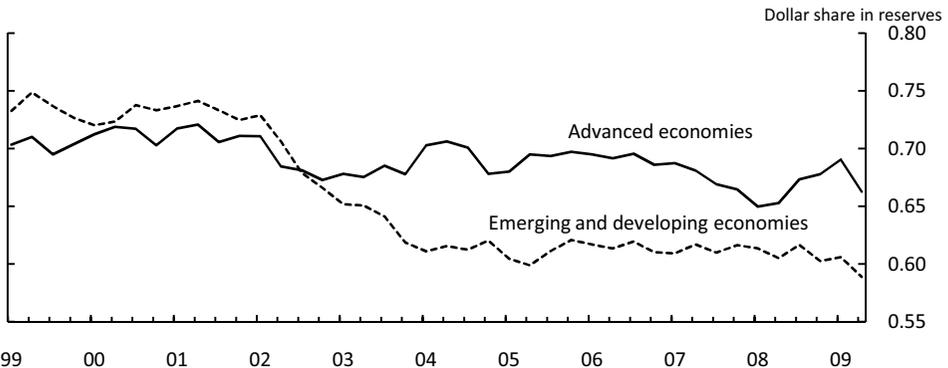
(NIIP). The full result was an increase in U.S. net liabilities to foreigners of nearly 10 percent of GDP; see Figure 20. If such patterns continue for long, even a reduced level of U.S. foreign borrowing raises sustainability concerns. It seems plausible that, in the future, foreign private investors will become less willing to hold dollar debt in view of the unsettled U.S. fiscal predicament, while official holders of dollar reserves may well wish to diversify into other currencies. As Figure 21

FIGURE 20
**U.S. Net International Investment Position (NIIP)
 versus Cumulated External Deficits**
 Percent of GDP



Source: U.S. Department of Commerce

FIGURE 21
Official U.S. Dollar Reserves as Shares of Country-Group Totals



Source: IMF, *Currency Composition of Official Foreign Exchange Reserves* (as of September 30, 2009). <http://www.imf.org/external/np/sta/cofer/eng/index.htm>

shows, there is a long-term trend of official reserve diversification away from U.S. dollars, especially among the fast-growing, reserve-hungry emerging and developing economies, and this trend continues in recent data.⁴⁰ If a global portfolio shift out of dollars occurs, U.S. external borrowing rates could rise, while the customary favorable impact of dollar depreciation on the U.S. NIIP would be muted.

- China's current and projected external surpluses remain huge. In terms of an intertemporal trade analysis, Chinese policy is subsidizing the country's export of current consumption power in world asset markets, thereby keeping world real interest rates below their true equilibrium levels. Apart from the implied deflationary pressure on the world economy, the rest of the world's monetary response to this phenomenon—in the form of exceptionally low policy interest rates—provides a breeding ground for potential new bubbles. Reduced surpluses by China (and by Asian and other high-surplus countries more generally) would make it easier for the U.S. to reduce its deficit further. As a concomitant, Asian currencies would need to appreciate in real terms. These changes would have the further benefit of reducing protectionist tensions, notably those between China and the United States. The Asian model of export-led growth becomes more problematic if the U.S. is no longer the world's borrower of last resort.
- Global imbalances reflect national regulatory systems that still await major reforms. With the added post-Lehman investor perception that more big institutions are operating under a predictable umbrella of government protection, future financial instability could be in store. Large net capital inflows could inflate asset prices and make it easier for policymakers to avoid tough choices, including the politically difficult choice to tighten financial-sector regulation. Historically, it has been difficult to tighten prudential supervision in bubble episodes because inflated asset prices allow financial actors to argue that their balance sheets are strong.

What changes in the international monetary system might mitigate global imbalances in the future? A first concern is the proper reaction of domestic monetary policies to outsize movements in asset prices or credit flows. It has now become clear that *ex post* cuts in interest rates cannot be relied upon to clean up the debris of a financial collapse. To some degree, monetary policies should take greater account of financial market developments than they have in the recent past (although effective financial regulation must be the first line of defense, as discussed below). In particular, there is a case to be made that

large current account deficits, other things equal, call for a tightening of monetary policy. Ferrero, Gertler, and Svensson (2008) present an example in which better macro performance comes from a monetary rule that recognizes how an external deficit raises the natural real rate of interest. The question deserves more research attention.

Another aspect of the international monetary system that is ripe for improvement is the surveillance of and coordinated response to large imbalances. The current configuration of imbalances again reveals the familiar asymmetry between the adjustment pressures facing deficit and surplus countries. The continuing U.S. external deficit is perilous, as we have noted. Yet, reducing that deficit is hard in the face of ongoing recession; the U.S. is in no position to take the lead.

On the other hand, China, with its international reserves well over \$2 trillion and rising, has plenty of room to take the lead and should. Until now China has followed the Asian model that Japan pioneered, orienting its economy toward exports in order to exploit scale economies in production, to learn by doing, and to move up the value chain. With its vast internal market, however, China (unlike smaller Asian economies) is in a unique position to reorient its growth toward domestic demand without losing the advantages of scale. That difficult task will require an improved social safety net, but with Chinese consumption well under 40 percent of GDP, and roughly half the U.S. rate, there is enormous room for upward adjustment. China's position as the leading international lender, however, gives it little incentive to undertake consumption-enhancing reforms that would benefit not only its citizens, but also the entire world economy. Nor, as a surplus country able to sterilize reserve gains, is China under pressure to revalue its currency rapidly. In the past, even credible threats of trade barriers have evoked only minor exchange rate changes, while China's trade surplus has continued to rise as a share of GDP.

The September 2009 G-20 Pittsburgh statement on the surveillance of external imbalances therefore is a useful step in drawing attention to the dangers they create and to their underlying origin in national policy choices. The recent crisis has dramatically illustrated the important and pervasive external effects of domestic macro and financial policies. In the interest of global stability, the policy choices of sovereign nations, including their exchange rate arrangements, must be viewed as legitimate subjects for international discussion and negotiation.

Another area that deserves attention is the system of self-insurance through large holdings of international reserves. While a large stock of international reserves may enhance the financial stability of an individual country, a

system in which many countries hold reserves as their primary form of liquidity insurance could be collectively destabilizing. Aside from the opportunity costs of reserves to individual countries, there are *systemic* costs due to external effects of reserve management. Reserve holdings may unduly depress reserve-currency interest rates, reduce liquidity abroad when they are mobilized in a crisis, or create exchange rate instability as markets speculate on official portfolio shifts between different reserve currencies. Such systemic problems—discussed in earlier incarnations by Robert Triffin and others—have come to the fore in recent discussions of financial-system resilience.⁴¹ They could be mitigated by international institutions capable of creating and allocating outside liquidity in a crisis. But even a better-endowed IMF is a very partial answer to this need. Its effectiveness requires significant governance changes, as well as greater global attention to the worsening of moral hazard that a bigger international lender of last resort entails. Reform of the international monetary system is bound up with reform of the international financial system.

What changes in the international financial system might mitigate global imbalances in the future? We see at least two first-order agenda items.

The first is domestic financial development in the poorer economies. In some emerging market countries, notably China, high saving is promoted by underdevelopment and inefficiencies in financial markets. Structural shortcomings tend to raise both corporate and household saving rates. For example, if typical Chinese savers had access to relatively safe instruments offering higher rates of return, huge positive income effects would in all likelihood swamp substitution effects, resulting in lower, not higher, household saving. The result would be higher household welfare in China, as well as a reduction in China's foreign surplus.

The second agenda item is the regulation of internationally integrated financial markets. Now that the fig leaf of constructive ambiguity has been torn away, development of a globally more effective framework for financial regulation is an urgent priority. It is well understood that a rational and politically robust regulatory framework will have to be based on more extensive international cooperation than currently exists—notwithstanding the considerable progress made since the initiation of the Basel process in the 1970s. Given their significant and growing importance in world trade and finance, the emerging markets will rightly be full partners in any new arrangements.

As the 2009 Pittsburgh G-20 summit illustrated, however, international agreement on further concrete common measures is far away. While this is the case, large global imbalances will remain dangerous as possible manifestations of underlying financial excesses. Macroprudential regulatory stringency that

responds forcefully to financial booms will be the most important lever for avoiding financial busts in the future. A key challenge is to devise a set of reasonably simple and transparent *rules* for macroprudential interventions, rather than relying on a complex and shifting web of discretionary levers. Some observers have suggested that emerging markets use countercyclically intensive regulatory oversight in response to big financial inflows (Mohan and Kapur 2009, Ocampo and Chiappe 2003). Richer countries can usefully apply the same precepts in the face of big current account deficits.

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NOTES

1 See Obstfeld and Rogoff (2001, 2005, 2007).

2 Guha (2009).

3 While we would not fully subscribe to Portes's (2009) blunt assessment that "global macroeconomic imbalances are the underlying cause of the crisis," we find common ground in identifying several key transmission mechanisms from policies to the endogenous outcomes. Perhaps it depends what you mean by "underlying." Jagannathan, Kapoor, and Schaumburg (2009) ascribe industrial country policies of the 2000s to the increase in the effective global labor force brought about by the collapse of the Soviet bloc and economic liberalization in China and India. It is plausible that these changes exerted downward pressure on global inflation, as suggested by Greenspan (2004), reducing the price pressures that low policy interest rates might otherwise have unleashed. Nishimura (2008) posits that the same demographic forces placed upward pressure on industrial country asset prices in the late 1990s and 2000s.

4 At the end of their paper, Caballero, Farhi, and Gourinchas (2008a) point to the risks of excessive leverage, which are not incorporated in their model. Caballero, Farhi, and Gourinchas (2008b) extend their earlier framework to analyze the aftermath of a bubble collapse. Gruber and Kamin (2008) argue that, as an empirical matter, conventional measures of financial development explain neither the size of the net capital flows from emerging to mature economies, nor their concentration on U.S. assets. Gruber and Kamin also argue that U.S. bond yields have been comparable to those of other industrial countries, contrary to the view that American liabilities have been especially attractive to foreign portfolio investors. Acharya and Schnabl (2010) show that banks in industrial surplus and deficit countries alike set up extensive asset-backed commercial paper conduits to issue purportedly risk-free short-term liabilities and purchase risky longer-term assets from industrial deficit countries, mostly denominated in dollars. This finding also throws doubt on the hypothesis that emerging market demand for risk-free assets that only the U.S. could provide was the underlying cause of the U.S. current account deficit.

5 See also the concerns raised by Obstfeld and Rogoff (2005, 2007), as well as Obstfeld (2005), who follows up on these themes by warning, "The complex chains of counterparty obligation that have arisen in the global economy, typically involving hedge funds and other nonbanks and impossible to track by any national regulator, raise a serious systemic threat. . . . The systemic threat raised by Long-Term Capital Management's difficulties in 1998 could pale compared with what is possible now."

6 Bini Smaghi (2008).

7 Fukui (2004).

8 See European Central Bank (2004, pp. 9 and 17) and Padoa-Schioppa (2004).

9 Little mention was made of the fact that, while the current account of the euro zone as a whole was more or less balanced, a number of member countries were running large and rapidly increasing current account deficits (see below). Nor was much concern expressed openly about the fragmented nature of the euro zone's system of prudential oversight of financial markets.

10 Greenspan (2005). See also Greenspan (2004).

11 Bernanke (2005). Bernanke's ex post view, as expressed four years later (to the day) in Bernanke (2009), is more balanced in its assessment of the dangers of large U.S. current account deficits.

12 Unless otherwise noted, all data come from the International Monetary Fund's April 2009 *World Economic Outlook* database.

13 Some econometric studies likewise conclude that the saving glut theory offers at best a partial explanation of the high U.S. external deficit over the 2000s. See Chinn and Ito (2007) and Gruber and Kamin (2007).

14 Even before the high-tech bust, the Asian crisis had created conditions that contributed to a long-lasting fall in investment in the crisis countries (for example, see Coulibaly and Millar 2008). This investment decline contributed to current account surpluses ("excess" savings) for those countries.

15 Figure 7 shows the Case-Shiller 10-city index.

16 See Federal Reserve System (2003).

17 Taylor's critique is based on departures of actual Fed policy from historical Taylor rules consistent with macro stability before the 2000s. Other dissenters, such as Borio and White (2004), argued in real time that monetary policy could not adequately safeguard financial (and therefore macroeconomic) stability by focusing only on the narrow set of macro variables included in the simple Taylor rule. Instead, they argued, a broader view of the economic landscape, including asset prices and credit flows, should inform monetary policy.

18 Ahearne et al. (2005) present cross-country evidence on the effect of monetary ease on housing prices. A more recent study is by Iossifov, Čihák, and Shanghavi (2008). See also the discussion in Mishkin (2008).

19 Federal Open Market Committee (2004).

20 Trichet (2004).

21 The Bank of Japan (BOJ) did not begin to tighten until well after the Fed and the ECB. In July 2006 the BOJ raised its target overnight lending rate from 0 to 25 basis points. In February 2007 the BOJ raised the rate to 50 basis points.

22 See Goldstein and Lardy (2008).

23 On the link between monetary policy and commodity prices, see Frankel (2008). Caballero, Farhi, and Gourinchas (2008b) model the effect of a commodity boom on global net capital flows.

24 The events leading to the developing country debt crisis of the 1980s provide an instructive parallel with recent financial history. Then, inflationary monetary policies helped to create an oil price boom resulting in big oil exporter surpluses. The surpluses were recycled to "subprime" developing country borrowers through money-center banks in the industrial countries. Because loan contracts featured *adjustable* dollar interest rates, the Volcker disinflation led to repayment problems severe and widespread enough to endanger the capital of the lending banks. Although a number of economic analysts argued prior to the early 1980s that the sizable developing-country borrowings were justified by growth prospects, that episode of global imbalances also ended in tears—especially for the developing borrowers, who lost many years of growth.

25 A curious and so far unresolved aspect of the saving and investment data is the huge positive statistical discrepancy that emerged between 2003 and 2008. The more customary “world current account deficit” disappeared after 2002 and by 2007 and 2008, measured world saving exceeded measured world investment by amounts in excess of \$300 billion. There was a “mystery of the missing deficit.”

26 Conversely, a country can accumulate reserves even if its current account is in deficit.

27 See Obstfeld, Shambaugh, and Taylor (2010).

28 For a useful chronology and discussion of Chinese policy, see Lane and Schmukler (2007).

29 Mishkin (2008) surveys evidence on the impact of housing wealth on consumption. In subsequent work, Greenspan and Kennedy (2007) document the strong link between home equity extraction in the U.S. and consumption in the 2000s.

30 Acharya and Schnabl (2009). See also Blundell-Wignall and Atkinson (2008, p. 64), who suggest that “about one-third of the securitised sub-prime related products were sold to off-shore investors.”

31 See Baba, McCauley, and Ramaswamy (2009).

32 Asset swapping leading to gross flows may be motivated by many factors beside regulatory arbitrage, of course, ranging from risk-sharing opportunities to differences in risk aversion. The U.S. external portfolio as a whole has tended to be short on (dollar) bonds and long on foreign equities (and currencies), with foreign official holdings of dollar reserves comprising one important component of U.S. foreign liabilities. Caballero and Krishnamurthy (2009) present a model of how foreign demand for safe U.S. assets may have led to low risk-free rates, asset appreciation, and financial fragility.

33 The basic data come from Aizenman and Jinjarak (2009), though we have added Iceland to their sample and removed two countries with rather special circumstances, Russia and Serbia. The negative correlation survives the addition of Russia and Serbia, but it is somewhat attenuated. Figures 16 and 17 are inspired by chart 5 in European Central Bank (2007), which covers an advanced-country sample over 1995–2005. We are grateful to Joshua Aizenman for sharing these data.

34 Of course, there is a long historical association between housing booms, current account deficits, and financial crises; see Reinhart and Rogoff (2009).

35 See also the regression evidence in Jagannathan, Kapoor, and Schaumberg (2009). Fratzscher, Juvenal, and Sarno (2009) use a Bayesian VAR methodology to show that positive home and equity price innovations, especially the former, have large negative effects on the U.S. trade balance. For other VAR evidence documenting the importance of housing, see Punzi (2007) and Gete (2009). Gete (2009) also documents the strong cross-sectional relationship between housing booms and external deficits. In their cross-country study, Iossifov, Čihák, and Shanghavi (2008) find only a marginally significant correlation of home prices with the current account in equations that also control for the policy interest rate.

36 See, for example, Edison, Luangaram, and Miller (2000), Quigley (2001), and Koh et al. (2005).

37 See McGuire and von Peter (2009).

38 See, for example, Woodford (2001).

39 See footnote 32 above. Gourinchas and Rey (2007) present an econometric analysis demonstrating that U.S. net exports have predicted these price adjustments in past decades.

40 There was an abrupt decline in the dollar's reserve share for emerging and developing economies between 2002 and 2004 (as the dollar began its recent depreciation trend). The euro was the main beneficiary. There is evidence of a further decline in relative dollar holdings in recent quarters. In Figure 21, the dollar shares are computed relative to the reserves of only those countries that report reserve composition to the IMF. That group does not include China.

41 For an early and insightful discussion, see Crockett (2000).

COMMENTARY

**Global Imbalances and the Financial Crisis:
Products of Common Causes**

Ricardo J. Caballero

One of the main global economic concerns before the financial crisis was the presence of large “global imbalances,” which refer to the massive and persistent current account deficits experienced by the United States and financed by the periphery. This concern was intellectually grounded on the devastating crises often experienced by emerging market economies that run chronic current account deficits. The main trigger of these crises is the abrupt macroeconomic adjustment needed to deal with a sudden reversal in the net capital inflows that supported the previous expansion and current account deficits (the so-called “sudden stops”). The fear was that the U.S. would experience a similar fate, which would unavoidably drag the world economy into a deep recession.

As we all know, the crisis eventually came, and it came with more force than we all anticipated. However, the mechanism did not at all resemble the feared sudden stop, as quite the opposite occurred. During the crisis, net capital inflows to the U.S. were a stabilizing rather than a destabilizing force. The U.S. as a whole never experienced, not even remotely, an external funding problem.

Some pre-crisis imbalance critics have chosen to ignore the inconvenient fact that their anticipated mechanism played no role in the crisis, choosing instead to take the credit for the realization of the forecast of doom. One can feel the tension in the current paper: At times Maury and Ken are tempted to go the self-gratifying “I told you so” route, but they are intellectually too solid to do so, and hence they pull themselves out of it. Deeply at heart they still feel that global imbalances did it, but they also know that they need to find a different mechanism from the conventional sudden stop story if they are to match the facts.

I am not sure they have yet found a fully coherent mechanism, but this is fine since at this time no one can credibly claim to know exactly what happened. They want to blame it on economic policy here and abroad, but the story still needs more work to be fully convincing and serve as a guide to policy. In the body of the paper they talk about misguided sterilization policies in Asia that

facilitated postponing the reversal of loose monetary policy in the U.S., which in turn fueled the savings glut by boosting commodity prices.

But we know that the full story can be told without reference to monetary policy, just as a result of expansion and contraction of asset supply and demand around the world (see Caballero et al. 2008a,b). The paper argues against a narrow version of such a model which only considers asset demand (the savings glut story). I believe their evidence based on timing of events is consistent with the implications of the full demand-supply model. Thus, we still need more work to disentangle the relative importance of these stories.

In their conclusion they are more balanced and argue that financial underdevelopment in China is one of the main sources of the global imbalances.¹ But if so, what is the right policy with respect to global imbalances in the short run given these structural problems? And in particular, what is the form of optimal monetary policy? I could imagine scenarios where the optimal monetary policy is to be more expansionary than in the absence of the structural problems, in order to prevent deflationary forces from developing (Caballero 2006). In any event, I couldn't get a good sense from the paper on how to answer these important questions, and we certainly need answers for them . . . or at least I hope that we do seek them before rushing into implementing antiglobal imbalances policies.

Despite this general unease with the paper and its policy implications, I must admit that there are many great lines in it. One of my favorites is, "In effect, the global imbalances posed stress tests for weaknesses in the United States, British, and other advanced-country financial and political systems—tests that those countries did not pass. . . ." Brilliantly said, I fully agree with them. Although probably what they mean is a bit different from what I mean by *the test, its failure, and how to move forward*, thus I want to spend the rest of my comments developing my views on these things.

I believe that the root imbalance was *not* the global imbalance but a *safe-assets imbalance*: The entire world, including foreign central banks and investors, as well as many U.S. financial institutions, had an insatiable demand for safe debt instruments, which put an enormous pressure on the U.S. financial system and its incentives (Caballero and Krishnamurthy 2009). This is the stress test the U.S. economy failed.

Within this perspective the main mechanism prior to the crisis worked as follows: As the demand for safe assets began to rise above what the U.S. corporate world and safe mortgage borrowers naturally could provide, financial institutions began to search for mechanisms to generate AAA assets from previously untapped and riskier sources. Subprime borrowers were next in line,

but in order to produce safe assets from their high-risk loans, “banks” had to create complex instruments and conduits that relied on the law of large numbers and issuing a tranche of their liabilities. Similar instruments were created from securitization of all sorts of payment streams, ranging from car to student loans. Along the way, and reflecting the value associated with creating financial instruments from them, the price of real estate and other assets in short supply rose sharply. A positive feedback loop was created, as the rapid appreciation of the underlying assets seemed to justify a large AAA tranche for derivative collateralized debt obligations and related products. Credit rating agencies contributed to this loop, and so did greed and misguided homeownership policies, but they probably were not the root cause.

From a *systemic* point of view, this newfound source of AAA assets was much riskier than the traditional single-name highly rated bonds. As Coval et al. (2009) show, for a given unconditional probability of default, a highly rated tranche made of lower quality underlying assets will tend to default, in fact it can only default, during a systemic event. This means that, even if correctly rated as AAA, the correlation between these complex assets distress and systemic distress is much higher than for simpler single-name bonds.

The systemic fragility of these instruments became a source of systemic risk in itself once a significant share of them was kept within the financial system rather than sold to final investors. Banks and their structured investment vehicles (SIVs), attracted by the high return and low capital requirement combination provided by the senior and super-senior tranches of structured products, kept them on their books and, once satiated, began to pass their (perceived) infinitesimal risk onto the monolines and insurance companies (AIG, in particular). Through this process, the core of the financial system became interconnected in increasingly complex ways and vulnerable to a systemic event.

Much of the crisis is blamed on the crash of the real estate “bubble” and the rise in subprime mortgage defaults that followed it. But this cannot be all, or even much, of it. The global financial system went into cardiac arrest mode and was on the verge of imploding more than once, which seems hard to attribute to a relatively small shock such as the real estate/subprime combo. Instead, the real damage came from the unexpected and sudden freezing of the entire securitization industry. In a moment’s notice, confidence vanished and the complexity which made possible the “multiplication of bread” during the boom, turned into a source of counterparty risk, both real and imaginary. Senior and super-senior tranches were no longer perceived as invulnerable, and worsening matters, banks had to bring back onto their balance sheets more of this new risk from the now struggling SIVs and conduits. Knightian uncertainty took over,

and pervasive flights to quality plagued the financial system. Fear fed into more fear, and caused reluctance to engage in financial transactions, even among the prime financial institutions.

Along the way, the underlying structural deficit of safe assets that was behind the whole cycle worsened as the newly found source of AAA assets from the securitization industry dried up, and the spike in perceived uncertainty further increased demand for these assets. Safe interest rates plummeted to record low levels.

As I said, global imbalances and their feared sudden reversal *never* played a significant role during this deep crisis. In fact, the worse things became, the more both domestic *and* foreign investors ran for cover to *U.S. Treasuries*. Instead, the largest reallocation of funds was across asset classes, in particular from complex to simple safe instruments.

From this perspective the core policy problem to deal with is how to bridge the safe-asset gap without overexposing the financial sector to systemic risk. Raising capital requirements is a knee-jerk policy reaction to reduce vulnerability, but it does not help to deal with the structural problem of excess safe-asset demand. Quite the opposite, by reducing the financial sector's ability to grow its balance sheet, it will worsen the safe-asset gap. The cost of this policy distortion is stronger headwinds for the recovery and the risk that the same pattern of systemically vulnerable safe-asset creation may migrate into the shadow financial sector or elsewhere in the world that is even less prepared to absorb the systemic risk. We need a more balanced response, trading off vulnerability reduction and the safe-asset gap, to determine the socially optimal level of capital requirements (which may well be higher than the pre-crisis levels, especially for illiquid assets) and complementary measures.

To be clear, the main failure was not so much in the private sector's ability to create AAA assets through complex financial engineering as it was in the systemic vulnerability created by this process. We should preserve the good parts of this process while finding a mechanism to relocate the systemic risk component generated by this asset creation activity away from banks and into private investors (for small and medium-size shocks) and the government (for tail events). This transfer should be done on an *ex ante* basis and for a fair fee, which can incorporate any concerns with the size, complexity, and nationality of specific financial institutions. There are many options to do so, all of which amount to some form of partially *mandated* insurance provision from the government to the financial sector against systemic events (see, e.g., Caballero and Kurlat 2009).

To conclude, while there are many good points in the paper, as one would expect from two stellar academics, I do not think the paper identifies the core of the policy problem we need to address. There is no doubt that global imbalances exacerbated the safe-assets imbalance, since emerging markets have a particularly severe deficiency in producing safe assets, but the real problem is this deficiency not the global imbalances per se. We should not get distracted with secondary illnesses.

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NOTE

1 Which, incidentally, is the main point in Caballero et al. (2008a,b). Contrary to the claim in the current paper, we did not argue that global imbalances were desirable. We simply pointed out that the causes behind them were more structural than it was typically assumed at the time. In particular, we emphasized the financial underdevelopment of emerging Asia and commodity producing economies, and the subpar growth of continental Europe.

COMMENTARY

**Global Imbalances and the Financial Crisis:
Products of Common Causes**

Jacob Frenkel

As you indicated, this paper has two discussants, and I'm the last one. So, when I saw what Maury presented and what Ricardo said about the paper, I thought, what should I say? So, I decided to start by going farther back to the topic of imbalances.

First I noticed that today is the 22nd anniversary of "Black Monday," October 19, 1987, when global financial markets plunged. If you recall what happened then and confused cause and effect, we might have said that the lesson from 1987 is that the U.S. Secretary of the Treasury, James Baker, should never have flown to Germany to scream at the German Finance Minister, Gerhard Stoltenberg, to tell him that Germany should lower its interest rates in order to reduce its current account surplus because this projected a lack of coordination among global policymakers. This is a very interesting interpretation, but for the external imbalances that were prevailing then it does not really go to the foundations of the issue.

This paper gives a choice about the possible causes of the financial crisis. Was it the imbalances? Was it because of regulatory failings? Was it greed? Was it due to domestic policies? I would say it's all of the above. You can look at it in whatever way you want. After all, exports minus imports is savings minus investment as well as expenditures minus income. You can look at the causes of the financial crisis in whatever way you want and then dissect it the way you want. It's not so much an issue of what is correct and what is wrong, but rather what is useful and what is less useful in understanding the cause of the crisis.

I think that the best way to think about the crisis is to focus on the extent to which the imbalances made the global economy more vulnerable to shocks. We have all studied why when there are shocks countries try to smooth consumption over time by running external imbalances. So why do we worry about imbalances? Well, we worry about them if the system is vulnerable and if there are shocks things may go bad. Therefore we need to ask, what could go bad, what did go bad, and that's what this paper does.

I think that one of the key points is a truism: Trees do not grow to the sky. Or as Herb Stein said, if things are not sustainable, they will stop. The point is

not the truism itself, but rather, when things do not grow to the sky and when the unsustainability stops, how does it stop? Does it end in a crash? What are the spillovers? Do we know how to absorb the corrections and the like?

For this, I have a friend. He comes from the planet Mars, and he visits planet Earth from time to time. When he visited us this year, he saw that everyone was talking about external imbalances. He wanted to know where the imbalances are located, and I said the U.S. has a \$370 billion deficit, while Asia, primarily China, has a \$579 billion surplus. So he said, that's an interesting phenomenon. Let me try to understand, where do these imbalances come from and what's the vulnerability? And then, he remembered that the last time he visited here back in 2006, there were also imbalances and they were even larger. In 2006 the U.S. deficit was about \$800 billion, well above the \$370 billion deficit it has now. Correspondingly, China had a significantly higher surplus. At that time, the oil-producing countries and Russia also had significant surpluses, while Europe's current account was balanced. Then he asked, why are you screaming about external imbalances today? You should have screamed in 2006. And I told him, yes, my friend, but the fact that the imbalances were not sustainable in 2006 had a spillover effect, and that's what we see today in the current crisis.

Did we experience an adjustment, a correction, or a crash? From this picture, you might not be able to know fully, but some people told him, this will teach us a lesson. And he remembered that the last time he visited Earth, he went to the guillotine and saw the condemned guy go to the electric chair saying to himself, this will teach me a lesson. Well, even though it was a little bit too late for the condemned guy my friend said to him, will you learn, will you remember?

And then, my friend remembered that when he went to Wall Street in the past, they told him that there are two types of investors, those with short memories and those with no memories. He said, how can I be sure that all of these reforms will ensure that we are not going to be there again? He realized that all of these stories about greed are true, but we cannot expect regulation to change greed. The role of regulation is to ensure that the system with all its human nature traits will not be a dangerous system; don't look for a moralistic, ethical approach, but rather look at the incentives and be sure that things work well. In fact, as you compare the reality today in late 2009 to last year, my friend sees that credit spreads are shrinking, risk capital is starting to come back, the system is a bit more transparent, and there is discussion about better accountability and accounting. And he says, be careful. Remember that this discussion was much more vocal when the G-20 countries met in London earlier this year, but somehow the appetite to make these changes is diminishing because the

statistics show there has been some improvement. So, first of all, go faster and make sure that you don't celebrate the improvement too much and too prematurely. Did we see this movie again, or have we seen it before? Because remember, my Martian friend was also at the meeting between Stoltenberg and Baker in 1987.

The so-called policy coordination framework that was developed in the 1980s did not work too well, yet we are talking about it again now. The key difference between the system of the past and the system of the present is that we are in a fast-forward mode, with markets globalizing and interacting more rapidly. Interaction can come from trade, it can come from capital markets, it can come from banking, it can come from a variety of channels. And today, the financial system is just a road on which one travels much faster than in the past, and therefore the cost of a mistake is much higher.

But then my friend said, they taught me in grammar school on Mars—by the way, on Mars there is early economic education—that S minus I is equal to the current account surplus. So, what are the fundamentals? And he says, oh my goodness, we have a huge dispersion in savings in the world. China is saving more than 50 percent of its GDP, while the U.S. is saving less than 10 percent. Obviously almost any equation will predict that in this framework, China will have a surplus and the U.S. will have a deficit if they were the only two countries in the world. But remember, he told me, they are not the only two countries, so you can't analyze bilateral deficits and surpluses in a multicountry world. Then he asked, so why did you send your Secretary of the Treasury to China to ask them to appreciate their currency? I said, because this may improve the X minus M . He said, yes, but don't forget it is the same thing as S minus I ; why would anyone save less if you allow the currency to appreciate? Can't you find a better policy framework that will reduce the incentive to save, that will induce them to pay dividends and reduce the corporate retained earnings, that will encourage them to develop their social security system, pension system, and secondary financial markets so that individuals and companies will not need to self-insure so much but will instead use the market, et cetera? So, the question is, why are they afraid to appreciate? And the answer is because they are worried about employment and they depend on exports; therefore they really don't want to create a slowdown. If that's the case, why don't you push for more structural reforms so the change in the exchange rate will not have such devastating real effects?

This is the dialog that is going on between the economist and those who read the headlines of the popular press. But where this discussion becomes potentially dangerous, if not lethal, is when you ask, who holds reserves in the

world? Then you notice that today China is holding \$2.27 billion of reserves, twice as much as the second largest holder, Japan, and a very significant part of that has accumulated in the last few years. In fact, the flow, the accumulation of reserves during the past four years in China has been 10 times as much as it was in Japan.

If that's the case, then we understand why we must engage China. But what does it mean in terms of U.S. borrowing from foreign countries officially? Who abroad holds U.S. Treasury bills? Well, 25 percent or so of all outstanding Treasury bills held abroad are in China and Japan and, as we said, most of it in China was accumulated very recently. This sounds like a vulnerability.

The other vulnerabilities are that, if you look at financial markets and the size of the derivatives market in the U.S., the magnitudes are so big that you wonder how to deal with it. The Bank for International Settlements has been promoting that statistic about the size of the derivatives market for a long time. A popular solution, which I think is the right one to start with, is to make them trade in exchanges.

What about the banking system? When we see that in most regions of the world we have had write-downs and credit losses, that's the dark column, and we have had capital raised, that's the lighter column. In Europe, banks have raised more capital than write-downs. Asia, again the same. But in the U.S., capital losses and write-downs have exceeded the capital raised.

So, my Martian friend says, does that mean that banks need more capital? And the answer is yes, especially in the U.S., where systemically important institutions probably will need to have more capital. Thus requiring more capital is a key part of the kind of regulatory reform we are engaging in. But this gives the impression that, if only you come up with the right regulations, everything will be fine. Then you say not all financial institutions have been damaged to the same extent over the past couple of years. We had low interest rates that increased the appetite for risk, yet some financial institutions had better risk management and risk monitoring than others. So, we had better make sure that there is more capital, but by the same token that there is far better risk management.

And what about the very large financial institutions? Well, we are talking a lot about exit strategies for the Fed, and we have heard the Fed explain its strategy very well. We have talked a lot about exit strategies for the Treasury, but the fiscal exit strategy is not articulated very well. In addition, there is another exit strategy that needs to be discussed, which is an exit strategy from the paradigm of too-big-to-fail. This is where we find moral hazard and everything

else that ties the hands of policymakers. And that's why I think the notion of a resolution mechanism for large companies that go bad is a very important one. By the same token, maybe some of these companies should not be so large, especially if they move away from their core businesses and competencies. So I would say that, while the regulatory stuff is very important, it's not a panacea. It has to be done right, especially if you want to continue with globalization and not be afraid of external imbalances that can destroy everything. If you understand the background, then you had better make sure you don't create the framework for a devastating regulatory arbitrage albatross. And in order to not create such a framework, policy harmonization should involve harmonization of regulatory frameworks in an interconnected world.

In the old days 22 years ago, when Andrew Crockett, Morris Goldstein, and I were working on policy coordination for the G-5 countries which later became the G-7, the notion was to coordinate global fiscal policies through the "tango principle": you go forwards, they go backwards—it was a complete illusion, it never worked, it will never work. So, it is really a matter of policy cooperation, policy harmonization of the regulatory framework, not of policy actions.

We do have a world today in which the major countries run large fiscal deficits. So, we have huge and growing fiscal deficits around the world. And we say that this is a good thing because it's supposed to stimulate economic recovery. But it hasn't stimulated so well yet. So you ask yourself, why doesn't it do what it was supposed to by the simple spending multiplier?

To me one of the reasons is that there is no clear articulation of how you get out of this box of growing stocks of government debt. How do you exit? It is clear to me that if you say that you are going to have a very large deficit—although everyone knows that trees do not grow to the sky—but you don't say whether it will be resolved by higher taxes on capital, higher taxes on labor, or more protectionism, it paralyzes economic performance. So, I think that one does not need to say, let's withdraw the stimulus today, in order to articulate how you will withdraw it when you do. And frankly, if you articulate it very well, I don't think you will need another stimulus package. But at the end of the day, we see now that debt is increasing to levels that we have rarely seen, and it's that way all over the world.

So you ask yourself, what happens in a world in which public debt is so big but there are no signs of how you can get out of it? Who is being crowded out? And then you realize that basically, we had a problem that started from excess leverage—excess leverage of households, excess leverage of banks, excess leverage of firms—and then suddenly something happened. Trees stopped growing

to the sky, and people needed to deleverage. So, what do you do in order for this deleveraging to be not so painful? You decide to let leverage rise in the public sector, to offset the implications of deleveraging in the private sector.

So, there is a presumption that public sector leverage is going to be better than private sector leverage. I think that we need to make this point clear and, if that's the case, you must demonstrate when public sector leverage is better than private sector leverage. If you explain it well, I think that it will end up, indeed, being better.

GENERAL DISCUSSION
**Global Imbalances and the Financial Crisis:
Products of Common Causes**

Chair: Rakesh Mohan

Mr. Mohan: Thank you very much Maury, Ricardo, and Jacob, for very absorbing presentations. Mike Dooley?

Mr. Dooley: Thank you. Instead of making my standard comment at this point, that you've got the wrong crisis, the same point Ricardo made very well, let me try to do something else and that is put two things together. If Mike Mussa is right and this is going to be a V-shaped recovery, then we're going to have a current account deficit for the U.S. in the neighborhood of 4 or 5 percent of GDP by the end of next year. That's inevitable unless there's a big relative price change. Andrew Sheng said that the emerging markets are already under pressure from capital inflows. A week ago, the Central Bank of Brazil bought 5 billion dollars in one day to prevent appreciation of its currency. My point is that, unless we have the crisis that Maury and Ken have been predicting for a long time, by the end of 2010 we're going to be in exactly the same situation we were before the current crisis. If that puts an unbearable burden on the U.S. financial system to intermediate those net flows and, much more importantly, the gross flows associated with that, then the only feasible policy response we have between now and then is reregulation and supervision. We're not going to change international imbalances between now and the end of 2010. As Chairman Bernanke suggested this morning, if these international capital flows put an unbearable burden on the U.S. financial market, then we can predict with pretty high probability that exactly the same issues are going to arise in a very short period of time. So, to conclude, we better do something fast to make sure the system can handle these capital flows.

Mr. Mohan: Taka? If everyone can make it very brief, I think we will be able to get more questions in because we have very little time.

Mr. Ito: My prior is that global imbalances and the housing bubble and bust have very little connection. And my prior comes from the Japanese experience: Japan had huge surpluses in the 1980s and still got the bubble and bust. So,

bubble and bust could happen any place; it has little to do with current account surpluses or deficits. I think the connection some people push is that, because China was willing to recycle the surpluses into the U.S., the U.S. interest rate didn't rise as it might have otherwise. But how much would the interest rate have needed to rise to stop the bubble and bust? During the bubble in Japan 20 years ago—and also in the U.S. more recently—housing prices were rising 20 percent, 30 percent a year and raising the interest rate by two percentage points, like John Taylor would have preferred, wouldn't have stopped it. So, I'd be interested in hearing your thoughts on this.

Mr. Kashyap: I think we're all asking the same question in slightly different ways. The paper concludes, appropriately in my view, that central banks ought to take current account balances into account in the formulation of monetary policy, particularly when the regulators are not on the ball. So, how do you take the next step and neither argue that we should mechanically add the current account as a third argument in the Taylor rule, nor go to the other extreme and say that central bankers ought to take all the data into account when formulating policy? Can we be more precise about how the conduct of monetary policy needs to change?

Mr. Eichengreen: This is a question for Ricardo. Financial institutions created these very complex securities with a lot of leverage, and then they kept them off their balance sheets. So, where is the logic that this stuff should have stayed on the balance sheets, and if it has to do with the incentives that Jacob was talking about, why do we want the government insuring whatever it is that permits that to happen?

Mr. Mohan: Michael Mussa and Joshua will be the last questions.

Mr. Mussa: As an international macroeconomist, I have to admit international imbalances must have played some role in the crisis, and in particular, in the excessive buildup in the residential investment sector in the U.S. But my main question is, is this similar to other circumstances where we've seen sizable capital inflows? And there is an extraordinarily dramatic difference and it appears, conveniently, on the final page of the Obstfeld and Rogoff paper. At the height of the crisis, the dollar's exchange rate spiked upward. In previous crises for emerging market countries, the exchange rate spiked downward. There was an absolute total difference of reaction of the foreign exchange market because people all around the world still had supreme confidence in the U.S. dollar and U.S. Treasury obligations as the safe asset of the system. The question that we need to ask is, the U.S. had a budget deficit of 1 percent of GDP in 2007, having

reduced the debt-to-GDP ratio in the 1990s. Now it looks like we're going to be seeing persistent deficits through the next decade, at least, pushing that debt-to-GDP ratio up in the neighborhood of 100 percent. If we had another crisis, would the authorities have the same flexibility to substitute official credit for private credit and to expect that the dollar would remain strong, perhaps even appreciate, rather than crash? Or would we have spent the credibility that was essential to stabilize the situation a year ago because of the large-scale persistent buildup of government debt?

Mr. Mohan: Last question, Joshua Aizenman.

Mr. Aizenman: Mike Dooley made the point that ideally we would like to impose better regulations to prevent more financial crises like we've seen in recent years. But Mike Mussa told us that it's apparently an impossible mission to predict such crises. I agree that there should have been much better regulation. But if Mike Mussa is correct and it's impossible to predict crises, maybe there will be a second or third bust. Maury Obstfeld is correct then that we should worry about global imbalances. So I agree with what Mike Dooley said, but I don't see any obvious demand of the average voter to push for a lot more regulation. That leads back to Maury's main point: maybe we are stuck in a third-best situation.

Mr. Mohan: Thank you. I have to add my question, which is a very simple one. According to the data that you showed, you can see that something really changed around 2003–04 in terms of the increasing magnitude of global imbalances. Now Chinese exchange rate policy has been roughly the same over the past 10 years, though in fact, it became a little less rigid in 2004. So, what happened in 2003–04 that changed everything? Who wants to go first? Reverse order, Jacob, so that Maury can have the last word?

Mr. Frenkel: I will just make one point, which is that external imbalances will always be with us, reflecting differences between income and spending across countries. When do these imbalances matter in a fundamental sense? They matter when the accumulation of imbalances creates additional obstacles that normally would not have existed. For example, concern about the right level of China's exchange rate has become a political issue rather than remaining a purely technical economic issue. And why is this the case? Because of the magnitude of the stocks of assets and liabilities that have built up with ongoing external imbalances over time. Let me give you another example. There has been a proposal coming from China about reviving the use of the SDR (special drawing rights). There are many good reasons to think about the SDR, but when the idea

comes from China I cannot resist a cynical interpretation that they feel stuck with very large dollar reserves that they cannot unload. They know the dollar is likely to decline if they unload their dollars all at once. If they go to the market to do it gradually, it would take too long. So wouldn't it be nice to have a mechanism with which to engage in a big swap with the IMF? I give you the dollars, you give me the SDRs, and everyone will live happily thereafter. Well, it might be nice, but it cannot be the rationale for reform of the international monetary system. What I'm saying is that the accumulation of large external imbalances may create unintended consequences that aggravate the situation beyond what normal current account balances would create.

Mr. Mohan: Ricardo?

Mr. Caballero: Let me address Anil's point. I think that we learned from this crisis very clearly that triple-A tranches of CDOs are much more dangerous than triple-A's from single named bonds and they have to be treated differently, especially if they're on the balance sheets of banks. Of course, insurance arrangements can help offset some of the risk of holding these kinds of instruments. Now, let me go back to a point that Jacob made, that people do make mistakes. I'm writing the Mundell-Fleming lecture and the title is "Sudden Financial Arrest" and I draw an analogy between what physicians do and what we economists do. Physicians also advise people to lower cholesterol, do exercise, and all these kinds of things, but they also have big defibrillators because they know some people will eat cheeseburgers and have heart attacks. So, the problem here is that some banks and important financial managers will make mistakes that will cause a crisis. You want to protect the rest of the system and that's the reason you need insurance against these kinds of things.

Mr. Mohan: Thank you. Maury, you have the last word.

Mr. Obstfeld: I can't possibly respond to all the points that were made in finite time, though I particularly want to thank my discussants, Ricardo and Jacob. I'll try to touch on a couple of the points that were raised from the floor in terms of focusing on Ricardo's discussion, which was more critical of the paper. One point we make in the paper is that the current account deficit of the United States reflected factors that were ultimately linked to the crisis. We're not saying the current account deficit caused the crisis. That's definitely not what we're saying. Of course, in economics nothing is indisputable, but when policymakers see a large current account deficit, particularly a large increase in a current account deficit, they should worry. There are some cases in which it's benign. Norway's development of North Sea oil in the 1970s was benign. But in many

situations large current account deficits are an indicator of trouble. It doesn't mean, to come back to Taka's point, that you need a current account deficit to get into trouble. You can get into trouble with a surplus, so it's neither necessary nor sufficient, but it is one of the things that one should worry about. One should ask, why is the current account deficit so big? Is it a benign phenomenon or are there things we should be worried about? And in the U.S. economy, there were things to worry about. The monetary policy makers, if you read the FOMC minutes and European central banks' discussions, were worried about those things. They did not react aggressively to those weaknesses, but if they had done so, we might have had a milder crisis or no crisis. The other role of the current account deficit, I believe, was in making it easier for policymakers to do nothing. Without the ability to run deficits there would have been greater inflationary pressures and greater pressure on interest rates. Again, would these have been sufficient to prick the housing bubble or to cause a vigorous enough response? We can't really know, but I think in terms of looking at the qualitative responses, the current account deficit, the ability to borrow, particularly with China's and other Asian countries' willingness to lend, was a facilitating factor.

Now, as far as the response of the dollar goes, that's a really interesting question. Unlike what many or most commentators envisioned, it turned out to be a global crisis, not a U.S.-specific crisis and, in fact, there was a sudden stop in capital flows. People stopped buying private U.S. assets. The U.S. was able to finance itself by selling foreign assets; so unlike in the case of an emerging market economy that has been borrowing but not lending, there were lots of available modes of finance which don't require foreigners to actually lend. The U.S., as Mike pointed out, did appear as a safe haven in this situation, and we do question in the paper whether this credibility of the dollar will continue. An interesting factor which is related to the points Ricardo was making about the demand for safe assets is that one of the main drivers of the demand for the triple-A rated tranches of CDOs was banks, primarily in Europe, that were looking to economize on required capital by holding triple-A rated securities; it was regulatory arbitrage. And when the credit markets froze, these banks, having large holdings of dollar assets, needed dollar financing, which I believe had an effect on the dollar, beyond the safe haven effect in the crisis period, creating this counterintuitive movement. Part of it, of course, is the safe haven effect.

Ricardo's point about currency and maturity mismatch is very interesting; the U.S. external portfolio does exhibit a huge risk mismatch, as the U.S. tends to borrow in safe assets while lending in risky assets. We tell emerging market

economies not to incur debt, especially not short-term debt, attract foreign direct investment, and get portfolio equity investment; but the U.S. ignores this advice. It is basically recycling safe short-term borrowing and some long-term borrowing into equities, and that's part of what's been responsible for the current account deficit not making the kind of dent you would think in the U.S. external position until last year. Equity markets have been buoyant. When equity markets are buoyant, the U.S. does well. The other factor that helps the U.S. in this regard is that the U.S. can borrow in dollars. So, when the dollar depreciates unexpectedly the U.S. net external position improves because the U.S. tends to hold foreign currencies. It's long in foreign currencies, in part, through its foreign equity holdings. So, this has been a very favorable circumstance and forecasting that that will continue in the face of the crisis experience and what it's done to the perception of our financial institutions and especially to our fiscal position is very risky.

Mike Dooley is completely right to worry about a renewed crisis. We're hearing some of the same language about interest rates that we heard in 2003, accommodation will be maintained for an extended period. We see bubble-like factors in East Asia, and it's very unclear what will happen in the future. As Mike asked, in the next crisis, will the dollar maintain its customary safe haven status? I think it's anyone's guess.

Mr. Mohan: Thank you, very much. I would like to first thank the current panel, Maury Obstfeld, Ricardo Caballero, and Jacob Frenkel. And to end this session I'd really like to thank all the authors and the discussants, for very absorbing papers and discussions as well as the audience for all their comments. We really had a very, very interesting morning. Of course, as you can see from this particular discussion, there is a lot that remains to chew over and discuss. The only thing I would say is that the return to some normality in financial markets should not make people forget the actual huge monetary losses the world has sustained because of this crisis. I think that really should give us thought in terms of the repair job that remains. We really can't be complacent. The final point I would make is, particularly since this conference has to do with Asia, there are lessons from Asia in the current crisis, since financial markets and banks in the region were able to remain relatively safe despite the huge downturn. What is it that they did after the 1997 crisis which enabled their financial sectors to withstand the crisis that is taking place now? Finally, I would like to thank the San Francisco Fed for inviting all of us here.

KEYNOTE ADDRESS

Reforming the Global Financial Architecture

Andrew Crockett

Introduction

“Architecture” may seem a rather pretentious word to describe the ad hoc set of arrangements that make up the current international financial system. Even a reformed financial system will surely lack the clarity of structure and design that are the hallmarks of good architecture. But a financial system should nevertheless conform to certain broad principles, which can be readily understood and widely accepted. It is these principles that I want to talk about today.

To my knowledge, there is no generally agreed definition of what is meant by the term “global financial architecture.” I will take it to encompass three things: *first* the basic economic model by which international financial relations are conducted; *second*, the network of institutional arrangements that are put in place to manage these relations; and *third*, how decisionmaking power in the system is distributed among individual countries. I hope that what I mean by each of these aspects will become clearer as I go along. My central theme is that all three aspects of the international financial architecture have been profoundly affected by the way in which the world economy has evolved over the past few decades, and by certain trends that have come to a head in the current crisis.

The first major trend of the postwar era has been the growing ascendancy of the free market philosophy. This has led to a focus on open and global financial markets as the principal driving mechanism for the international allocation of resources. Not only is this a somewhat different model of international financial relations from that envisaged at Bretton Woods, it has called for new institutional mechanisms to manage it. Now, however, the current financial crisis has placed in question the validity of some aspects of this new model.

The second major trend has been the growing weight in the world economy of newly emergent economies. This has rendered outdated the distribution of power in the global institutions created after the Second World War. The fact that the crisis had its origins in the major financial centers has intensified the calls by emerging markets for more say in how international financial relations are managed.

These trends, and the questions now being raised about the financial architecture, have major implications for Asian economies. Asian countries have been both the beneficiaries and occasionally the victims of financial globalization. They have been the countries that have seen their shares of world output and trade grow the fastest. Asia therefore has a key interest in a more robust framework of international finance, and in a more equitable sharing of decision-making authority. But it has hitherto played a relatively minor role in the design and management of the international monetary system.

In my remarks today, I will begin by considering the changing economic model of international financial relations, and how institutional structures have been adapted to reflect the changes that have taken place. I will then say something about how the experience of the past two years has altered perceptions of the working of the system, and how reforms are taking account of the lessons learned. Finally, I will discuss how the relative roles of different countries need to change to reflect new realities of the global balance of economic power.

The Changing Model of International Financial Relations

The basic model of international economic relations has evolved enormously from the system set up in the aftermath of the Second World War. In the words of Padoa-Schioppa and Saccomanni, the international monetary system has gone from being “government-led” to “market-led” (Padoa-Schioppa and Saccomanni 1994).

The Bretton Woods system, established in 1944, assigned a key role to governmental decisionmaking. And it did so in a framework of largely separate and independent national financial systems. Consider four central features of an international financial system: the exchange rate regime, the balance of payments adjustment process, international liquidity creation, and payments arrangements. Under Bretton Woods, all had a substantial measure of government management. *Exchange rates* were fixed and could be changed only by intergovernmental agreement in specified circumstances of “fundamental disequilibrium.” Otherwise governments were expected to defend them by exchange market intervention. *Balance of payments adjustment* was pursued through the deliberate use of domestic demand management to secure a stable current account. *International liquidity* depended on the fixed dollar price of gold, and the mechanism for liquidity creation was hotly debated in international fora. And *capital account payments* were in most countries subject to restriction through exchange controls.

Over time, however, this government-led system was undermined by forces of economic liberalization, particularly in capital markets. Capital controls proved difficult to enforce and were eventually rejected on philosophic grounds also. The fixed exchange rate system among the major countries broke down in 1971 and was replaced by a floating regime, in which market forces played the major role. International liquidity became essentially demand-determined, as aggregate reserve balances were increasingly based on national decisions. And the adjustment process was largely market driven, with major governments eschewing current account targets and allowing exchange rate movements, rather than domestic demand policies, to perform the function of equilibrating demand and supply for foreign exchange. In sum, where previously governmental decisions had dominated the management of the international monetary system, by the latter decades of the 20th century, market forces largely guided cross-border flows of real and financial resources.

To be sure, not all countries moved to the same extent or at the same pace. Many emerging markets still today manage their exchange rates and maintain some capital controls. But by the beginning of the current century, it was possible to say that the basic architecture of the international financial system was based on market forces, which in turn operated through open and global capital markets. Nation states generally accepted a responsibility to pursue prudent domestic monetary and fiscal policies, but this was assumed to be consistent with allowing market forces to determine exchange rates and international financial flows.

Institutional Implications of the New Model

A major consequence of the liberalizing trend was an enormous expansion in cross-border capital flows. The separation that had existed between national capital markets in the earlier postwar years was almost completely eroded, and a single global capital market developed. Concomitantly with this process, financial market players were growing in size and geographical spread. They were developing new financial instruments that facilitated the management of risk and taking of positions in a wide range of markets. As markets became more “complete” it became harder for government policies to escape their discipline. If anything, however, this was regarded as a further benefit of a market-driven international financial system.

The growth of global financial markets signaled significant changes in the basic model within which international economic relations were managed. The relative importance of *governmental* decisions about exchange rates, liquidity

creation, and so on declined relative to *regulatory* decisions about how financial institutions and markets were supervised.

Within national economies, increased importance was attached to central banks, whose monetary policies directly affected financial market conditions, and to those agencies responsible for the regulation and supervision of institutions and markets. To begin with, however, and, with the benefit of hindsight, surprisingly, the preservation of financial stability was not a major focus of regulators' attention. Many financial systems had been heavily regulated for decades, with controls on permitted fields of activity, market entry, prices of services, and interest rate levels. These controls resulted in financial repression but effectively insulated financial systems from instability. Basically, the cushion of rents was so large that failures were highly unlikely.

With the flowering of liberalization, however, the model of an administratively regulated financial system came into question both nationally and internationally. The basic assumption of the liberal economic model was that market forces are largely beneficent, and so the thrust of regulation should be to facilitate their operation. In such a model, the dangers of financial instability might be greater, but it was thought that these dangers could be controlled by a combination of the enlightened self interest of market players, the self-equilibrating properties of markets, and risk-based, "light touch" supervision by the regulatory authorities.

The international dimension of a lightly regulated market-based financial system was the need to ensure a level playing field for global financial institutions, through comparable regulation in individual national markets. But which body, in the "architecture" of the system, should be charged with promoting the necessary global cooperation?

The International Monetary Fund (IMF) was not well suited to this task for several reasons. One was the fact that the expertise of the Fund had been built up in the macroeconomic area, and the Fund staff had relatively less experience in financial matters. Another was the fact that the Fund was an intergovernmental agency, largely dominated by finance ministries, whereas much of the authority in the financial arena was wielded by other agencies such as central banks and financial regulators.

As a result, and little remarked by observers at the time, important areas of responsibility for the management of the international financial system passed into the hands of bodies other than the IMF. A number of these were found in Basel, where central bankers had been meeting since the 1930s. With the increased prominence of monetary policy as the principal tool of macro-

economic policy, and the growing independence of central banks, the monthly (later bimonthly) meetings of central bank Governors in Basel became a significant element in the structure by which international economic relations were managed.

Other significant developments in the institutional architecture were the creation in 1975 of what later became the Basel Committee on Banking Supervision, the growth in the authority of the International Organization of Securities Commissions (the securities regulators, IOSCO), and the establishment of a network of central bank committees to monitor market trends and developments. Finally, in 1999, the Financial Stability Forum was established to bring together in a single body the key institutions concerned with issues of national and international financial stability.

Three aspects of this new institutional architecture are worth noting. First, it developed largely ad hoc and outside the framework of formal treaty obligations. This gave it flexibility in operation but robbed it of legitimacy. Second, it was largely unplanned, in the sense that each committee was established to meet a particular need with little attempt at coordination or overall design. And third, it developed within a philosophical framework that regarded market forces as largely stabilizing.

The Impact of the Crisis

What does the current crisis tell us about the desirability and effectiveness of a market-based, global financial system and the architecture that has developed to manage it? There are many lessons, but perhaps the most obvious one is that unfettered market forces have not prevented a synchronized global meltdown in financial markets, with devastating consequences for real economic activity and employment. We have learned that market failures are more widespread and problematic than we previously believed. A lightly regulated financial system does not necessarily tend to a stable equilibrium.

Reforms to the previous regulatory philosophy are therefore called for. The questions now faced are what these reforms should be and how they can be brought about. Will they be a modification at the margin of the basic open market approach? Or will they involve much more far-reaching restraints on market forces, and perhaps a move back from globalization? As these issues are being resolved, there is also the question of what institutional structure will be most effective in managing a reformed financial system.

One view is that globalization has been proved wanting in the present crisis, and that what is required is a much greater dose of governmental involvement in

key economic areas. This could include more managed exchange rates, stricter controls over movements of capital, and tighter licensing of financial products. It could also involve more governmental control of the shape of national financial systems, perhaps through breaking up financial conglomerates and/or limiting the activities of foreign firms. Those who favor this approach recognize that it involves a retreat from globally integrated financial markets but feel that the costs of this are less than advertised, and worth paying to obtain the benefits of greater stability in national financial systems.

There are undoubtedly superficial attractions to more direct government involvement in key financial markets and prices, and more local control over national financial markets. It could help avoid some of the consequences of unfettered market overreactions. It could prevent governmental policy objectives from being frustrated by market developments. Emerging markets in Asia, for example, feel vindicated in their policy of managing exchange rates, accumulating large foreign exchange reserves and maintaining capital controls. Those that have limited foreign involvement in their financial sectors believe this has helped protect them from a drying up of lending.

More restrictions over financial institutions could also limit some of the costly cross-border contagion we have seen. Regulators such as the Financial Services Authority in London are seeking to guard against imported instability by introducing measures to require global institutions to manage their local balance sheets according to national prudential standards. There are calls for financial innovation to be managed so as to avoid the use of “weapons of mass financial destruction.”

Seductive as some of these arguments are, I believe that, if pushed too far, they carry significant potential costs for the world economy. Accepting them unquestioningly could begin a trend that might lead to the fragmentation of capital markets and a retreat from globalization. It should not be forgotten that globally integrated capital markets have brought great benefits. The aim of the reforms that are now urgently needed should therefore be to preserve these benefits while addressing the specific defects that have resulted in such damaging instability. The new financial architecture should therefore be based on a greater recognition that market failures can occur, that market forces therefore need to be better controlled, and that new institutional mechanisms are needed to manage these processes. How can this be achieved?

Concerning macroeconomic variables, it is clear that market forces can cause capital flows and asset prices to overshoot. But this does not mean that governmental decisions would be better. As a general matter, the reverse is almost

certainly true. But we probably need a conceptual framework that enables us to decide when it is legitimate to override market signals in the interest of systemic stability. Take the case of asset bubbles. For a long time, it was assumed that asset bubbles were impossible to identify in advance, and that the best policy was to mop up the consequences after they had burst. Now, there is greater interest in seeing whether credit financed bubbles can be addressed as they are emerging, and how monetary or regulatory policies can be used to control them. Research is beginning to have some success in identifying early warning signals of unsustainable financial imbalances.

In attempting to make counteracting financial imbalances operational, however, international cooperation will be key. It will be very important to have a coordinated view of what is possible and desirable in this area. Divergent approaches could well lead to inconsistent monetary policies and to undesirable exchange rate movements. The aim should be the correction of potential *sources* of instability rather than trying to suppress their consequences.

Moving from macroeconomic concerns to financial regulation, it should be possible to devise market-friendly tools to preserve stability, rather than administrative-type restrictions on what financial institutions are allowed to do and where they are allowed to operate. The crisis has demonstrated that banks need to hold larger capital buffers to internalize the costs of potential public support, and that the range of institutions subject to supervision should be widened. It has also shown the need to address procyclicality in the financial system and to take a much wider view of the macroprudential aspects of systemic stability. There is thus a strong basis for an internationally coordinated set of guidelines for managing financial systems. Devising and implementing these guidelines presents a demanding, but achievable, research and policy agenda for the international community.

There would be significant drawbacks if individual countries pursued separate approaches to strengthening their financial systems. The benefits of a global capital market depend on reasonably consistent national regulations to provide a level playing field for competition. Without this, there are risks of regulatory arbitrage. Experience seems to suggest that in the presence of regulatory arbitrage national regulators will seek to erect barriers to cross-border activities, in order to preserve their capacity to control risks in their domestic financial system. This may be understandable, but it undermines the benefits that flow from a global capital market.

In my view, an efficient international financial architecture should involve a truly global framework of supervision and regulation, together with international

agreement on the management of crises and the resolution of failing institutions. Only in this way would regulators be able to assure public opinion in their respective countries that they were protected against the risks of financial instability, while preserving the benefits of an open international financial system.

Three principles are of key importance. First, regulation should be based on a common framework of rules across national jurisdictions. This is the easiest (though still not easy) element to achieve. Banking and other financial regulators should agree on minimum prudential standards for the institutions under their control, and for a common coverage of regulated institutions and markets. This requires building on the current Basel capital standards, with modifications to strengthen guidelines that have been shown to be inadequate.

Second, and harder, there need to be understandings about supervisory implementation, i.e., about how regulations established by common agreement are interpreted and enforced. This is difficult because national supervisors have a statutory responsibility for the institutions incorporated within their jurisdiction, and do not always feel able to rely on the prudential supervision of foreign supervisors over foreign-based institutions. The key here is to find mechanisms, perhaps through colleges of supervisors, which provide reassurance to national supervisors that they can rely on the judgments of foreign peers.

The third element is a mechanism that permits the orderly winding down of a failing institution. This is undoubtedly the hardest, as it goes to the heart of national legal systems and touches on the fiscal responsibilities of national governments. For moral hazard reasons, no institution should be perceived as too big to fail, so mechanisms are needed that will allow failure without imposing unacceptable costs on either national taxpayers or partner countries.

There are four key prerequisites of an acceptable failure regime: (i) imposing losses on stakeholders that are predictable and consistent with avoidance of moral hazard; (ii) avoiding unnecessary damage to “innocent bystanders,” especially when that would provoke a loss of confidence in otherwise sound financial institutions; (iii) minimizing taxpayer costs; and (iv) sharing equitably across affected countries any residual fiscal burden.

This is a demanding set of requirements. I fully understand that they are easier to set out than to implement. But unless we are able to build a more cooperative international structure of supervision and crisis management, we are at risk of squandering the gains of many decades of growing financial globalization. No region would be at more risk of losing from this than Asia. For this reason, Asian countries need to have clear ideas about how the architecture of finance should be reformed, and to be prepared to use their enhanced role in the global decisionmaking process to this end.

The Distribution of Decisionmaking Power

I come, finally, to how power and influence should be exerted by participant countries in the international financial system. This has been a dominating theme in discussions about the reform of the IMF.

The reason for the debate is obvious. Since the early 1970s, there have been rapid changes in the relative economic weight of different countries, which have rendered obsolete the preexisting power structure in international finance. This is particularly apparent in the quota shares of the IMF and World Bank. Changing economic weights have affected many regions, but they are most clearly evident for Asia. Asian countries have developed rapidly over the past three decades or so. Excluding Japan, their share of world output has risen from 7.8 percent in 1975 to 14.6 percent today. Even this understates the growth in the importance of these nations in international financial relations. Asia's share of world exports has risen from 8 percent to 23 percent over the same period, and its share of global foreign exchange reserves from 21 percent to 49 percent.

It is clear that Asia merits greater representation in the key international decisionmaking bodies. But to be effective in increasing Asia's voice, Asian countries need to be clear on their objectives. A first question is to identify the bodies that are likely to be most influential in shaping the global financial architecture. A second is to develop a strategy for achieving more "clout" in these bodies. A third is to work out what it is Asian countries want, in a substantive sense, in the model of international financial relations. And a fourth is to utilize their growing voice collectively to achieve these goals. Let me end my remarks by commenting briefly on each of these.

Concerning the bodies that will wield the most influence in the financial system of the future, it would be a mistake, in my view, to focus only on the IMF and World Bank. These are certainly important institutions, and the IMF will probably play a major role as the forum for discussing macroeconomic imbalances. But also of importance will be the G-20 and the various subgroups formed under its aegis. In this connection, the Financial Stability Board (FSB) assumes particular prominence. It seems likely that the FSB will be the forum that develops the regulatory structure of a reformed financial system, and makes recommendations about international harmonization of regulatory standards. Also of key importance will be the various committees established under the umbrella of the Bank for International Settlements, which will also participate in the FSB. These include, in particular, the Basel Committee on Banking Supervision, the Committee on the Global Financial System, and the Committee on Payment and Settlement Systems.

The good news is that the Asian members of the G-20 are now also members of all these bodies. But this still leaves open the second question, that of how to develop a voice in the committees commensurate with the growing importance of Asian economies. This is not a question of voting power, since there is no voting structure in the committees. Rather, influence depends on the perceived value of the intellectual contribution to the discussion. So it will be important for Asian countries to be represented by respected technical experts, with the latitude to participate in discussions without being bound too restrictively to a “party line.” Formal statements prepared by capitals are unlikely to be well received.

Third, and most importantly, Asian countries need to decide exactly what shape of international financial system best suits their needs for the medium- and long-term future. In my view, Asia will be an increasingly active participant in cross-border financial relations and would benefit from an architecture that facilitates global integration of capital markets and banking systems. If this is true, Asia would benefit from a supervisory structure in which more decisions were harmonized at the global level. This of course runs counter to instincts to preserve domestic freedom of action in regulatory matters. It will be necessary for Asian countries to decide where their long-term balance of interest lies, and pursue that holistically, rather than react to particular issues on an individual basis.

Finally, Asian countries need to decide how to concert their voice to best effect in groupings where there will inevitably be disparate interests. Given that the G-20 and FSB are ad hoc groupings and do not have the legitimacy of universality and a treaty basis, I believe it would be useful for Asian members of these bodies to “reach out” to nonmember countries in the region, both to keep these countries informed of developments and to solicit their input to key decisions. This would enhance the legitimacy of the Asian voice.

Conclusion

Allow me to sum up. The “architecture” of the future global financial system seems likely to continue to be based on a market-driven model, but one in which market regulation will play a more substantial role than hitherto. The institutional structure for managing such a system will probably be fragmented, with various international regulatory bodies playing a role alongside the established international financial institutions. And Asian countries have the opportunity to have a larger voice in the management of the system.

If I am right in this, the architecture of the new arrangement will not be tidy. But it will be based on a number of key principles, which it is important to

keep in mind as specific arrangements are developed. These include: a recognition that open markets are the basic organizing framework for international financial relations; a willingness to intervene to counter market failures where there is a collective judgment that such failures have occurred; a network of institutions to give effect to the principles just outlined; and a distribution of authority within these institutions that allows all participant countries to feel their views are adequately taken into account.

It will be a challenge to put these principles into effect. But the prize is worth it, in terms of a stable and cooperative international financial system that exploits the undoubted advantages that global capital markets can offer.

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GENERAL DISCUSSION

Reforming the Global Financial Architecture

Chair: Rakesh Mohan

Mr. Crockett: I'm well aware that I'm standing between now and whatever activities are in play this afternoon, but Janet says I may answer some questions.

Mr. Sato: Thank you very much indeed for this very insightful presentation covering both historic developments and the global agenda worldwide. In thinking about the future architecture of financial regulation, I think one of the bridges between the idea of trust in the market mechanism and actively avoiding systemic instability is to get the incentive structure right. For instance, compensation schemes which put too much emphasis on short-term profit maximization drove bank managers into reckless activities. In credit derivative transactions, profits coming from the transactions were recorded immediately, while the risk that was taken at that time materialized much, much later. To make the best use of the market mechanism and to be effective in our regulatory system, the incentive mechanism for financial market participants is very important. Could you give any recommendation or advice about the incentive structure?

Mr. Crockett: Well, we're all economists and we know the importance of incentives, and it's key to get the incentives right such that they are stabilizing for the system as a whole. In that sense, I think you're right to point to a host of different incentives. Compensation is obviously a key element, and it is, of course, a very public and high-profile element. I do think that some of the actions that have been taken are going to be beneficial in that regard.

I would make just two points. First, we should be careful to think that if we fix compensation we've solved the problem of instability; that was a contributory element, but I don't believe it was by any means the only contributory element. Second, I think it's going to be very important when we try to harmonize incentives to do so equivalently across countries. If individual countries pursue their own policies, regulatory arbitrage or, in this case, physical arbitrage of traders across tax jurisdictions will come into play.

Mr. Bery: As you know, there's been a lot of momentum regionally within Asia after 1997, basically around the ASEAN plus three countries. Do you have a

view on how Asian initiatives would interact with the G-20? To draw an analogy from trade negotiations, there has been a lot of exegeses on the relationship between regional arrangements and global arrangements; do you have a view on how the two might mesh and how the leading Asian countries should concentrate their firepower between the regional and the global?

Mr. Crockett: This is not a subject on which I'm an expert. I think that regional arrangements can be in some circumstances positive if they are open regional arrangements and if the purpose is to build a fully multilateral system. Of course they often deteriorate into inward-looking and barrier-erecting kinds of arrangements. I'm a little bit afraid about the new architecture of the G-20. I think one of the big risks will be that within the G-20 there may develop blocks of emerging markets on the one hand and industrial countries on the other, or Asian countries versus other countries. I think it is very important for the participants to approach the discussions within regulatory bodies and within the Financial Stability Board as being an attempt to reach common agreements, and to make sacrifices in order to achieve agreement, rather than as being a platform for parading different points of view. There's obviously a risk of doing that when you've got a crisis such as the one that has come that's perceived by different people to be blamable on different entities. So, I think it's important that it is done in the spirit of promoting common agreement rather than in self-justification of any particular subgroup.

Mr. Liesman: I just wonder about the idea that what we really need is more global coordination. You began your speech talking about the idea that, in fact, a consensus about regulation had emerged, and I wonder the extent to which you're suggesting the best way to handle the next crisis is we should all adopt the same immune system, the danger being that if the right flu comes along, we all get wiped out. And I also wonder about the extent to which if we looked at countries where there were no banking crises—Canada, Australia, Singapore, and Hong Kong come to mind—to what extent were their regulatory systems different and better able to serve as backstops to what happened elsewhere in the globe?

Mr. Crockett: It's certainly a good point and what I wanted to say was not that there should be an identity of regulatory requirements, but there needs to be a harmonization such that you don't generate incentives for regulatory arbitrage between jurisdictions. I think in the case of Canada and Australia, they had strong domestic regulatory systems and I think there are a lot of lessons to be learned from them, but those were not regulatory systems that were

fundamentally based on the desire to prevent global capital flows. Of course they saw advantages in not having too much foreign capital. Each of them has limitations on foreign involvement in their banking systems and we need to ask questions about why that is the case, but they didn't have major barriers to capital flows across national boundaries. I'm really looking for a system in which it's possible to preserve the advantages that come from global capital markets and global competition while achieving the protections that obviously some countries were much more successful in doing.

Mr. Liesman: Andrew, if you don't mind another question from the press. You said that unfettered market forces had not prevented a financial meltdown. What do you say to those, such as John Taylor, who say that government policies and incentives, not unfettered market forces, had a major hand in causing the crisis by, for example, the role that government-sponsored enterprises played in enabling imprudent lending through the securitization process?

Mr. Crockett: Yes, that's a good point too. There's plenty of blame to go round, but I think even had government policies been perfect, one does need to ask the question, when you look at what's happened, whether we can be as confident. And let's face it, we have to build financial protections against, I'm paraphrasing Donald Rumsfeld here, against the world that we have rather than the world that we would like to have, and the world that we have has government policies that aren't always exactly what we want them to be. I think the structure of financial regulation and the management of financial markets have to be as robust as possible against shocks, whether they're wholly exogenous shocks or shocks generated by government policies.

Mr. Bullard: You've talked about bank resolution authority and one of the issues there is how credible would the resolution regime really be? There's enough difficulty just thinking about how to do it, but beyond that, it has to be completely credible. Otherwise these big firms, when they got into trouble, would be able to appeal to their national governments and be bailed out so that the effect of the resolution regime would be zero at the end of the day at the next crisis. So, I think it's important to somehow design a system where everyone knows what will happen if you get into another crisis.

Mr. Crockett: Well, this is, of course, as I think I tried to say, the most difficult of the issues I addressed, and I restricted myself to saying what the desirable properties were; perhaps I could have added credibility to the other four properties. It's not easy to do. First of all, I want to say that we really ought to aim for a system in which no institution was regarded by virtue of its size or

complexity as being too big to fail. I think there's something to be said—but I'm not wholly in agreement with it—for the “living will” proposal, whereby the regulators have got a clear idea about what they do to an institution that gets into life-threatening difficulties in a way that imposes losses on all of those that are stakeholders, so that nobody is pricing the credit they extend to a large institution on the assumption that they're going to get bailed out; so, those losses have to be there.

Clearly I think you're alluding to this point: If you have a global systemic meltdown, governments are going to have a role in the resolution, but I think the aim of what we do should make the system as little as possible dependent upon the ultimate power of governments, and as much as possible dependent on the power of market forces. And I think there are ways, it may not be totally credible, but there are ways of making credible the threat that those who lend, whether it's equity holders or debt holders, or counterparties, take adequate care in the extension of credit.

Fire, Flood, and Lifeboats: Policy Responses to the Global Crisis of 2007–09

Takatoshi Ito

1. Introduction and Key Observations

The objective of this paper is to examine the challenges faced by policymakers and their responses to those challenges during the various stages of the global financial crisis of 2007–09. The crisis originated as the burst of a housing bubble in the United States—similar to previous boom-and-bust cycles that had taken place in many countries. However, the size and severity of the crisis became so large that it has affected global financial markets throughout the world.

The crisis occurred over several stages, in which different segments of the economy and financial institutions became vulnerable. At each stage of the crisis, the U.S. Treasury and Federal Reserve took actions that appeared to be adequate to avert the worst possible outcomes. However, in retrospect, more forceful responses in earlier stages of the crisis may have prevented the large damages to the global economy and the burdens placed on taxpayers. Specifically, I argue that a legal mechanism that would allow governments to promptly take over troubled financial institutions in order to restructure or liquidate them should have been obtained by the Treasury and the Federal Reserve in the early stages of the crisis—ideally sometime before September 2008, but certainly immediately after the collapse of Lehman Brothers. A framework that provides for the orderly resolution of troubled institutions is the only way to prevent moral hazard from distorting the incentives faced by lenders, borrowers, shareholders, and management, yet maintain systemic stability.

One might argue that the above assertion is unrealistic and benefits from hindsight. However, there are sufficient lessons from past financial crises, including the United States' own savings and loan (S&L) crisis in the 1980s, the

Author's note: *The author is grateful to Professor Frederic Mishkin, Kevin Warsh, and other participants of the conference for their valuable comments. The author also is grateful to Namie Koyanaka, Paul Sheard, and Akihiro Wani for their help in obtaining market data and news and for their opinions and perspectives.*

Nordic crisis, the Japanese banking crisis, and even the Asian financial crisis in the 1990s, to have anticipated the course of events in the crisis and which policies would or would not work to address the challenges faced by policymakers.

In particular, I argue that in the earlier stages of the crisis policymakers should have pursued crisis management through large liquidity injections and regulatory reform, including the creation of a mechanism for resolving complex financial institutions.

The forced sale of Bear Stearns in March 2008 was a clear sign that the crisis had become sufficiently severe to threaten the stability of the entire financial system. An analogy would be a fire in an ammunition warehouse that threatened an entire neighborhood. From April to August 2008, financial market conditions deteriorated steadily. The crisis spread to Fannie Mae and Freddie Mac and to weaker investment banks. There were ample signs that the “fire” of crisis was spreading fast. However, policy measures at this stage were minimal. There was a perception that difficulties were limited to U.S. and European investment banks that were exposed to toxic assets.

The next shock was pivotal in the history of financial crisis. On Monday, September 15, 2008, Lehman Brothers filed for Chapter 11 bankruptcy protection after negotiations for a rescue merger broke down over the weekend. This changed the financial market conditions completely. Investors rushed to sell their risky assets and take cover in cash and Treasuries. A primary reason for the extreme volatility that arose was that prior to the weekend almost all market participants expected a Lehman Brothers rescue merger with public support, following the pattern of the Bear Stearns rescue merger. Letting Lehman fail avoided the moral hazard issues raised by critics of the Bear Stearns rescue, but the costs were very large.

The Lehman failure led to severe market reactions. Many markets became dysfunctional as buyers shied away from risky securities and refused to accept large institutions as counterparties in trades. The crisis fire rapidly spread to financial markets in many countries. Trouble was not limited to investment banks. The world’s largest insurer, AIG, developed an acute liquidity crisis, prompting the Federal Reserve to arrange for an \$85 billion loan. The problems at AIG would become deeper and would require much more assistance from the Treasury and the Federal Reserve in the coming months.

The responses of the Federal Reserve just before and after the Lehman failure were both innovative and far-reaching. The federal funds rate was quickly lowered from 2 percent to 1 percent by the end of October, and to the range of 0 to 0.25 percent (a de facto zero interest rate policy) on December 16. On October 9, excess reserves at the Federal Reserve became interest-bearing. The

policy target rate became a “corridor system,” with the floor at the interest rate earned by excess reserves and the ceiling at the high of the federal funds rate range. This stabilized the interbank market.

The Federal Reserve created many facilities in response to the numerous markets that had become dysfunctional. This long list of unconventional policies pursued by the Federal Reserve has been summarily termed “credit-easing” policy. On the international front, the Federal Reserve extended dollar swaps to a number of countries.

The most intense crisis period, from September 15 to the end of November, opened two doors, one to financial meltdown and one to regulatory reform. A crisis can also be an opportunity. Although wide-ranging, timely policy measures—essentially through a flood of liquidity—managed to shut the door to hell, policymakers did not go through the opportunity door. Efforts to achieve comprehensive regulatory reform were inadequate. Regulatory failure over investment banks, insurance companies, and nonbanks was evident, but a reform proposal to create an integrated regulatory body was absent. Instead, proposals stopped at increased coordination.

The most notable effort to stabilize the financial sector was the Troubled Asset Relief Program (TARP). A three-page outline of a fund to purchase troubled assets from banks was presented by Treasury Secretary Henry Paulson on September 21 (four days after the Lehman failure). A revised Treasury proposal was passed by both houses of Congress on October 3, and was immediately signed into law by President George W. Bush.

TARP was then slightly redirected to provide capital injections to financial institutions. On October 14, nine large banks received capital injections. Later, TARP was used for a variety of additional troubled asset purchases.

The Treasury and the Federal Reserve missed a crucial opportunity in the weeks following the Lehman failure with the explosion of the crisis across financial markets. This period was a window of opportunity to propose something more comprehensive and tough on banks. First, having just experienced two undesirable events—the Lehman Brothers bankruptcy and the large loan to AIG—the regulatory authorities should have proposed an orderly resolution mechanism for large complex financial institutions. Such a mechanism could achieve systemic stability by ensuring that very short-term obligations would be honored, while moral hazard—created by bailing out shareholders, bondholders, and subordinated debt holders, and, of course, by awarding executive bonuses—could be avoided. Having an orderly resolution mechanism provides a threat that can motivate serious restructuring. The original purpose of TARP, that is, separating out the bad assets and selling them to the

government—presumably at a deep discount—would not work without the threat that failed institutions would close.

The history of banking crises shows that it is important first to introduce due diligence (through asset examinations or stress tests) in order to determine whether banks are insolvent or solvent but undercapitalized. Given insolvency, a resolution mechanism should be applied. For large, complex, internationally active financial institutions, the resolution mechanism must be designed to allow competent replacement management to take over quickly. For undercapitalized banks, capital injections can be made, with conditions for reform that lead to a successful recovery plan. Capital injections without an examination of assets and a reform plan are tantamount to pure subsidy.

In sum, the Treasury and Federal Reserve missed two opportunities between September 15 and the end of December: First, they should have conducted asset appraisals (or stress tests) prior to granting capital injections. In this respect, the U.S. authorities repeated the same mistakes made by the Japanese government in their capital injections of March 1998 (no asset examinations, almost equal amounts of capital injection) and did not learn from the successful capital injections of March 1999 (which were made after asset examinations). Second, a resolution mechanism should have been sought immediately following the Lehman failure. With resolution authority, bank leverage would have been increased and the subsequent problem of executive compensation could have been prevented. Japan is often taken as a bad example of protracted banking crisis. However, Japan introduced its resolution authority and implemented it within a year of its financial meltdown in November 1997.

Although financial markets and financial institutions were somewhat stabilized by the end of December, and the worst appeared to be behind us by spring 2009, the financial system remained fragile, even with all of the liquidity provisions in place. On June 25, 2009, it was decided that all of the Federal Reserve facilities and the dollar swap agreements with 14 other central banks were to be extended to February 2010.

By the summer of 2009, most market indicators of risk were back to levels that prevailed before the summer of 2007. The worst is over and the Great Depression of the 21st century has been averted. However, two concerns remain. First, the market calmness is partly attributable to the continued provision of liquidity floods and liability guarantees. It is unclear how to withdraw these unconventional monetary policy measures and raise the policy rate, once the real side of the economy becomes strong enough, in a manner that minimizes the risk of reigniting a crisis fire. Second, the recovery of the real side of the

economy has been slow and the commercial real estate market is deteriorating quickly. It therefore may not be too late to establish a resolution mechanism.

The rest of this paper is organized as follows: Section 2 reviews the timeline of the crisis, with a focus on the behavior of market spreads as indicators of risk. The section also describes several important policy responses, both conventional and unconventional, in response to various financial shocks and market developments. Section 3 is dedicated to global reactions and policy measures. Section 4 provides assessments of policy responses to the global crisis. Conventional and unconventional monetary policy are examined, the quantitative easing pursued by the Bank of Japan (BOJ) in 2001–06 and the current credit easing of the Federal Reserve are compared, and the bank restructuring efforts in the crisis will be discussed in light of previous crisis experiences and the literature. Section 5 assesses key decisions leading to the Lehman Brothers failure and the AIG bailout. Section 6 discusses the remaining challenges for the United States and the rest of the world in order not to repeat the crisis of 2007–09 in the future. In the end, I argue that it is important to establish an internationally coordinated, publicly supported (through temporary nationalization), orderly resolution mechanism for troubled large, complex, internationally active financial institutions.

2. Timeline and the Spreads

2.1. Interest Rate Spreads and Credit Default Swaps

Counterparty risk—that is, the degree to which a bank is concerned about default by another bank—was a major cause of turmoil in the financial markets during the global crisis.¹ In particular, the creditworthiness of large American and European banks and investment banks was at the heart of these concerns.²

To illustrate this risk, Figure 1 shows two kinds of market spreads for the sample period from July 2007 (the beginning of the crisis) to September 2009. The spread between the three-month London interbank offered rate (Libor) and the overnight index swap (OIS) is a popular measure for counterparty risk and liquidity premium.³ Another measure of risk is the TED spread, defined by the difference between the Libor and the U.S. Treasury bill (risk-free) rate. The TED spread is a direct measure of credit risk of the large commercial banks that participate in the offshore interbank market. In general the two measures are highly correlated. Occasional deviations between the TED spread and the Libor-OIS spread is likely due to illiquidity.

FIGURE 1
TED Spread and Libor-OIS Spread
 July 2007 – September 2009

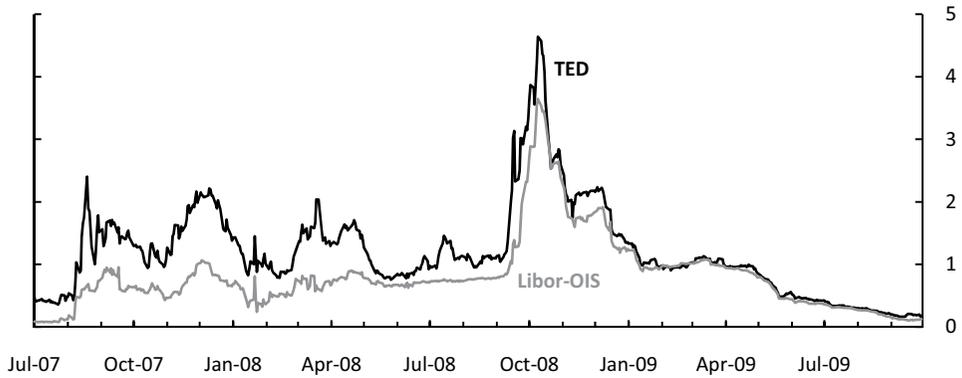


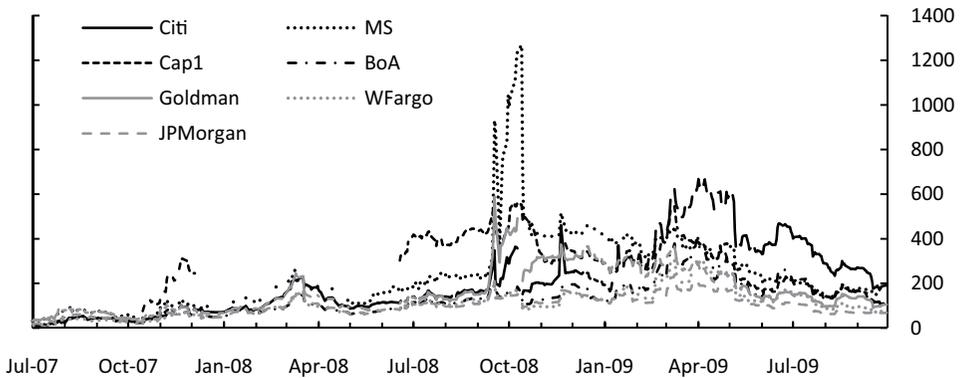
Figure 2 shows the movements of credit default swap (CDS) premia of major banks. This is a direct measure of the default risk of individual banks. Collectively, they should have high correlation with the Libor-OIS spread that measures counterparty risk.

2.2. Pre-Lehman Brothers

The initial stage of the burst of the U.S. housing market started in late 2006, but the ultimate severity of the crisis was not yet obvious. As housing prices continued to fall, some financial institutions started to experience higher default rates, shortages in liquidity, and balance sheet losses. In the first half of 2007, the financial institutions that had increased their leverage to accumulate housing-related securities had to unwind these positions to obtain liquidity, as losses were mounting. The U.S. and European investment banks, hedge funds, and other financial institutions sold assets to accumulate cash positions for possible withdrawals of funds, a phenomenon called “deleveraging.” Through the deleveraging process, the downward price pressure on assets became widespread in both major countries and in emerging market countries around the world.

The heightened risk became obvious in July of 2007. Between July 2007 and August 2008, there were three spikes in the spreads (these were more pronounced in the TED spreads): August/September 2007, December 2007, and March 2008. The spikes broadly corresponded to the suspension of the fund withdrawal by BNP Paribas on August 9, 2007, followed by the Northern Rock

FIGURE 2
Credit Default Swaps for Representative Banks



crisis on September 14, 2007; the large write-downs among investment banks' quarterly reports in December 2007; and the rescue merger of Bear Stearns by JPMorgan Chase with Federal Reserve assistance in March 2008.

Both the Libor-OIS and the TED spreads stayed between 50 and 100 basis points from the beginning of May to the end of July 2007. On August 9, 2007, BNP Paribas temporarily stopped withdrawal of three affiliated mutual funds, due to difficulties in calculating asset values of subprime mortgage-related securities. This event made it clear to all market participants that the mortgage problem was deeper and more widespread than previously believed. Market spreads jumped. On August 9 and 10, the TED spread jumped from 50 basis points to 100 basis points, and the Libor-OIS spread jumped from 10 basis points to 50 basis points. The spread continued to increase afterwards. The TED spread peaked at 240 basis points on August 20, while the Libor-OIS spread increased to 80 to 90 basis points in September 2007.

The TED and Libor-OIS spreads then decreased until the end of October, but started to increase again in November. By mid-December the TED spread was elevated to 200 basis points, while the Libor-OIS spread rose to 100 basis points.

Although various spreads had started to widen, the solvency of large financial institutions was not yet seriously questioned. However, the Federal Reserve became sufficiently concerned to begin lowering the interest rate in September 2007 and then establish the Term Auction Facility (TAF) on December 12. The policy rate of the United States was further lowered to 3.00 percent by the end of January, declining 225 basis points in six months.

With these aggressive cuts in the interest rate and the introduction of the TAF, the financial markets appeared to regain stability. The two spreads started to decline. As TAF auctions were planned and implemented, combined with strong messages from the Federal Reserve that these auctions would continue as long as necessary, the declines in spreads continued. It appears that the introduction of the TAF reversed the trends in the TED and Libor-OIS spreads.

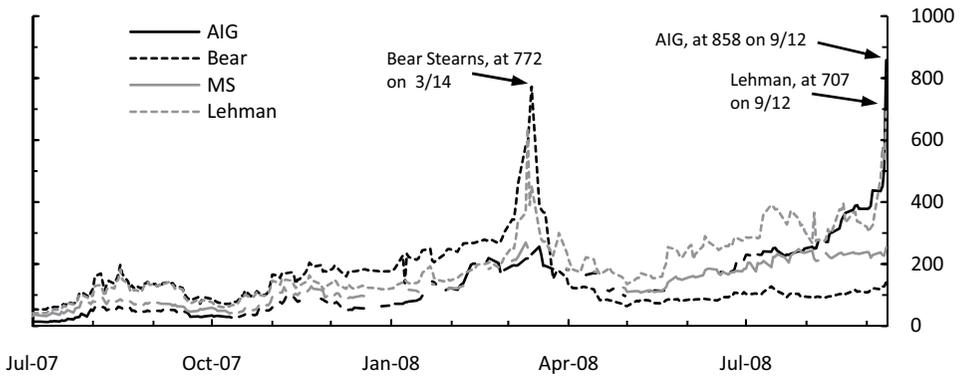
The CDS premia showed a very gradual increase from July 2007 to March 2008. The two peaks in August/September 2007 and December 2007, which are evident in the two interest rate spreads, are barely visible in CDS premia. Except for Capital One, all spreads move very close to each other with a slightly increasing trend until March 2008. This implies that the default risk of large investment banks was judged to be low until March 2008.

The rescue merger of Bear Stearns on March 9, 2008, was another major shock. JPMorgan Chase agreed to purchase Bear Stearns on March 16 at \$2 a share (a week later, the price was revised to \$10 a share), and the Federal Reserve guaranteed \$29 billion to offset losses on Bear Stearns assets purchased by JPMorgan Chase. The facility for Bear Stearns assets, Maiden Lane LLC, was created as a subsidiary to the Federal Reserve Bank of New York, in which the first \$1 billion in losses would be assumed by JPMorgan Chase and the rest by the Federal Reserve. The loss guarantee, or sweetener for the takeover, was unprecedented.

Figure 3 shows CDS spreads for failed institutions AIG, Bear Stearns, and Lehman Brothers, with Morgan Stanley included as a benchmark, through September 12, 2008. During the week prior to the Bear Stearns failure, CDS premia for Bear Stearns suddenly rose from about 400 to 772 (on March 14). The rise in CDS premia was also prominent during the Lehman Brothers failure (451 basis points on March 14), but not for AIG (232 basis points on March 14). This suggests that deterioration of the Bear Stearns portfolio was a surprise to the market. The emergency rescue with sweeteners was therefore attributable to a lack of time to make alternative arrangements.

In addition to the merger assistance, the Federal Reserve created two new facilities: the Term Securities Lending Facility (TSLF) on March 11 and the Primary Dealer Credit Facility (PDCF) on March 16, 2008. In addition, the federal funds rate was lowered by 75 basis points to 2.25 percent on March 18, and lowered again by 25 basis points to 2 percent on April 30. The Federal Reserve created the PDCF in response to the loss of liquidity by several investment banks.

FIGURE 3
CDS of AIG, Bear Stearns, Morgan Stanley, and Lehman Brothers
 July 2, 2007 – September 12, 2009



These measures seemed to be enough to calm the market, although it took until the end of April to lower the TED spread below 150 basis points. During the Bear Stearns crisis, the CDS spreads of Morgan Stanley and Goldman Sachs disproportionately increased. However, this increase was short-lived compared to the November–December episode.

On March 19, in response to tightening credit in housing markets, capital requirements of Fannie Mae and Freddie Mac were reduced to encourage them to increase their guarantees of mortgage-backed securities. However, this exacerbated their financial fragility. These government-sponsored enterprises (GSEs) are federally created institutions, but are privately owned. Although their liabilities are not explicitly guaranteed by the government, their bonds are widely considered to be implicitly government guaranteed. The yields of their bonds are only slightly above the corresponding level of Treasuries of comparable maturities. In fact, many of them are said to be held by foreign governments as reserves. When the financial soundness of the two GSEs became questioned in the market after June 2009, concerns were quietly expressed by these foreign governments that any hint of default may result in the crash of the U.S. dollar. Paulson requested government funds to support the two GSEs if necessary. Eventually, on September 7, the two GSEs were placed under federal conservatorship. Implicit guarantees thereby became explicit. Although Fannie Mae and Freddie Mac were in crisis from the summer until the first week of September, the spreads for TED, Libor-OIS, and CDS premia of other

financial institutions did not react in any measurable way. The market therefore anticipated the guarantees.

During the pre-Lehman period, the scope of difficulties was limited to U.S. and European investment banks that had created collateralized debt obligations out of subprime mortgages, and investors who bought those securities from them. U.S. dollar liquidity was needed by European investment banks to settle contracts and to deleverage positions. The Federal Reserve established swap lines with the European Central Bank (ECB) and the Swiss National Bank on December 12, 2007 (the same day the TAF was established), with ceiling amounts of \$20 billion and \$4 billion, respectively. It was unusual that European central banks felt the need for dollar liquidity for their large financial institutions. The need for dollar liquidity worldwide intensified, and the swap lines were increased on March 11, and were expanded to other central banks and uncapped after the Lehman failure.

The Federal Reserve's Federal Open Market Committee (FOMC) lowered the interest rate five times between September 2007 and January 2008, by a total of 225 basis points, and by another 75 basis points in March 2008, to help the collapsing housing market and in anticipation of slower growth. Lowering the interest rate was not expected to address the problems associated with deleveraging and the acute shortages of dollar liquidity, since these problems stemmed from counterparty risk. However, lowering the interest rate would help mortgage borrowers by making it easier for them to obtain refinancing with lower interest rates and longer maturities. At the time, inflation concerns were still prevalent, so the FOMC interest rate decisions were explained as based on expectations of weakness in the economy and financial instability. The decisions turned out to be prudent.

The Bank of England (BOE) also started to lower rates in December 2007. However, the ECB and the BOJ did not lower rates during this period. Indeed, the ECB raised its policy rate in July 2008, citing inflationary concerns. This shows that there was initially a lack of a sense of urgency in continental Europe and Japan before the Lehman failure.

In the pre-Lehman period, Asian financial institutions had suffered little damage, and the Asian financial markets and currencies remained stable. In fact, there was a sense of *schadenfreude* in Asia. All of the problems and policy advice that they had received during the Asian currency crisis and the Japanese banking crisis in 1997–98 was now being directed towards the United States.

When U.S. financial institutions such as Citigroup and Morgan Stanley asked for capital, Asian and Middle Eastern sovereign wealth funds were eager

to invest in these institutions. On November 26, 2007, it was announced that Abu Dhabi Investment Authority (ADIA), along with the government of Singapore, would invest \$7.5 billion in Citigroup, for a bond that carried an 11 percent yield, which would have a 4.9 percent stake in Citigroup when converted. On December 19, 2007, Morgan Stanley accepted \$5 billion for a 9.9 percent stake from the Chinese Investment Corporation (CIC), the sovereign wealth fund of China. These investments show that the governments and the financial institutions in China, Japan, and the Middle East considered the weakness in U.S. financial institutions to be manageable. Moreover, it provided an opportunity to invest in these institutions without political backlash, as they were assisting them in a period of distress.

2.3. Post-Lehman Brothers, United States

The financial vulnerabilities of several large investment banks became apparent in September 2008. By September 12, the CDS spread for Morgan Stanley matched levels reached immediately after the Bear Stearns failure. CDS spreads for other institutions had also been rising, but their levels were not alarming given the events in March. In particular, the TED and Libor-OIS spreads were stable in the week preceding the Lehman crash.

On September 10, Lehman Brothers announced losses of \$3.9 billion for the third quarter, an almost 50 percent increase from the \$2.8 billion lost in the second quarter. On September 12, Moody's and Standard & Poor's threatened to downgrade Lehman Brothers.

News media were reporting a possible rescue of Lehman Brothers by another financial institution. Earlier, the Korean Development Bank was reported to have considered investing in Lehman but had withdrawn. Instead Bank of America and Barclays were mentioned as institutions that might be interested in taking over Lehman Brothers. Almost all market participants expected that arrangements would be made that would allow Lehman Brothers to be bought by another financial institution.⁴

The CDS premium for Lehman Brothers on Friday, September 12, was 706.7, about 70 points lower than the level for Bear Stearns immediately before its demise. This demonstrates that the market was less worried about the possibility of Lehman's demise than it was about Bear Stearns at a comparable point in time. The market was clearly expecting a merger or some other form of rescue.

The market confidence that something would be done may have stemmed from the successful rescue of Bear Stearns in March. The market sentiment is a sign of moral hazard under the "too-big-to-fail" principle. The regulator was

the victim of its own success in extending a lifeboat to Bear Stearns, or to be precise, a subsidy to JPMorgan. Market participants expected another lifeboat for Lehman Brothers.

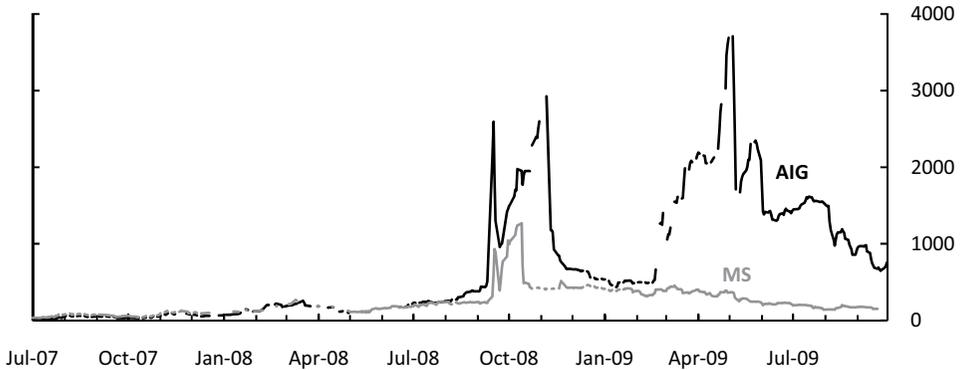
Intense negotiations regarding how to rescue Lehman Brothers took place in the Federal Reserve Bank of New York, with participants from the Treasury, the Federal Reserve, and major financial institutions. Bank of America and Barclays had expressed interest in purchasing Lehman, but they had demanded government assistance in the form of loss guarantees, similar to those given to JPMorgan when it purchased Bear Stearns in March. However, federal assistance was not forthcoming. Bank of America decided to purchase Merrill Lynch instead. Barclays remained in negotiation until Sunday afternoon. Finally, the Treasury made it clear that no government money would be added to the deal, and Barclays backed out.⁵

Lehman Brothers filed for Chapter 11 on September 15, 2008, which sent a shock wave to the financial centers throughout the world. Almost all of the financial markets in the United States ceased to function properly. In many securities markets, buyers disappeared as trading prices could not be found. Crisis spread from investment banks to money markets, and adverse effects also spread to financial institutions in other countries. This latter development put great stress on governments when these troubled financial institutions required nationalization.

Another crisis was imminent that same weekend. On Friday, September 12, the CDS premium for AIG hit 858 basis points, 150 points higher than that of Lehman Brothers. The source of AIG's financial problems was its huge exposure (selling) of CDSs to other financial institutions and investors. The fact that the CDS premium for AIG signaled its weakness was ironic. Market participants thought that AIG was in much worse shape than Lehman Brothers prior to the critical weekend.

On Monday, as the Lehman filing for Chapter 11 hit the media headlines, AIG debt was downgraded by the three major credit rating agencies. With the downgrade, AIG had to supply large quantities of collateral, analogous to margin calls, which were difficult to raise. In the evening, The Federal Reserve provided an \$85 billion loan to AIG in exchange for a stake in the company. The decision was made under Section 13(3) of the Federal Reserve Act.⁶ However, CDS premia for AIG did not fall immediately. Figure 4 shows the CDS premia for AIG from July 2, 2007, to September 30, 2009, with Morgan Stanley as a benchmark. The peak was May 5, 2009, at 3700 basis points.

FIGURE 4
CDS Premia for AIG



The market perceived that the \$85 billion loan would not be enough to rescue AIG, which turned out to be true. The loan from the Federal Reserve would be restructured on November 10 in coordination with the Treasury.

In response to chaotic market conditions in the aftermath of the Lehman failure, the Federal Reserve quickly created more facilities to help provide liquidity to various types of financial institutions. On September 19, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) was created. This was a direct response to the fact that large withdrawals of funds from money market mutual funds (MMMFs) had started to occur in response to news that a money market fund had incurred a loss to principal, or “broke the buck,” on September 16. The MMMFs hold a large quantity of commercial papers (CPs). If they liquidated these CPs, many firms would be driven to bankruptcy due to a lack of liquidity and working capital. The AMLF was created to stop this from happening.

Similarly, the Commercial Paper Funding Facility (CPFF) was established on October 7 to allow the Federal Reserve to purchase high-quality CPs. On October 21, the Money Market Investor Funding Facility (MMIFF) was established under the Federal Reserve Act’s Section 13(3). (See the discussion on the governance issue regarding Section 13(3).) Under this facility, the New York Fed would provide senior secured funding to a series of special purpose vehicles to facilitate an industry-supported private-sector initiative to finance the

purchase of eligible assets from eligible investors. On November 25, the Term Asset-Backed Securities Loan Facility (TALF) was created. This facility was designed to help market participants meet the credit needs of households and small business by supporting the issuance of asset-backed securities (ABS) collateralized by student loans, auto loans, credit card loans, and loans guaranteed by the Small Business Administration. Under TALF the Federal Reserve Bank of New York would lend up to \$200 billion on a nonrecourse basis to holders of certain AAA-rated ABS backed by newly and recently originated consumer and small business loans. The Treasury essentially underwrote these loans so that the Federal Reserve balance sheet would be protected from losses on this facility.

The TAF allotments were also increased on September 29. Goldman Sachs and Morgan Stanley were allowed to become bank holding companies so that they could access the Federal Reserve discount window. This change also meant that their principal regulator was now the Federal Reserve.

On the monetary policy front, the policy rate was cut again on October 8, by 50 basis points to 1.5 percent, as part of an internationally coordinated policy easing. The Fed began paying interest on excess reserves on October 9.⁷ The policy rate was then further cut by 50 basis points to 1 percent on October 29. On December 16, the Federal Reserve adopted a new policy rate target range of 0–0.25 percent. This was virtually a zero interest rate policy (ZIRP), reminiscent of the Bank of Japan policy from 1999 to August 2000, and March 2001 to 2006. (The difference between the BOJ's quantitative easing and the Fed's credit easing is discussed in a later section.) The Federal Reserve had then entered the era of ZIRP with unconventional monetary policy.

The TED and Libor-OIS spreads increased sharply on September 15, in the wake of Lehman's demise, and continued to increase until mid-October. The TED spread peaked at 460 basis points, and Libor-OIS at 350 basis points on October 10. CDS premia for Morgan Stanley shot up to 1200 basis points. Other financial institutions also experienced elevated CDS spreads. The CDS spreads became increasingly differentiated among financial institutions. In the immediate months after Lehman's failure, CDS premia for Morgan Stanley, Goldman Sachs, and Capital One remained high, followed by Citigroup. Bank of America and Wells Fargo spreads remained low. After March 2009, CDS premia for Citigroup increased sharply, while others were on a gradual decline. CDS spreads for Citigroup remained higher than others until September 2009, when all CDS spreads fell below 200 basis points, the prevailing level before the Lehman failure.

The TED and Libor-OIS spreads came down to around 100 basis points in mid-January 2009. The deviation between the two spreads then disappeared. Spreads remained around 100 basis points until the end of April. The two spreads started to decline in May, and fell below 50 basis points in late May. The two spreads became less than 20 by the end of September, clearly suggesting that conditions were again normal as far as liquidity and counterparty risk was concerned. CDS market spreads also indicate that market participants now believe the extreme turmoil in the financial markets is over. However, these assessments should be qualified as the calmness has been attained partly due to ZIRP, all those “facilities,” and other policy measures.

3. International Responses

3.1. Conventional Monetary Policy and Policy Rate Cuts

I next examine the timing of monetary easing among the Fed, the ECB, the BOE, and the BOJ. As explained in earlier sections, only the United States was engaged in aggressive interest rate cuts before Lehman’s failure in September 2008. After the events of September, the Bank of England aggressively cut the interest rate from 5 percent in that month to 0.5 percent in March 2009.

The ECB was more cautious about inflation in 2007. It even raised interest rates from 4 percent to 4.25 percent in July. However, in the following month, the ECB cut the interest rate to 3.75 percent. The decline in ECB interest rates was slower than for the Fed or the BOE and reached 1 percent in May 2009. The more cautious policy stance at the ECB may be due to its self-imposed policy mandate that keeps its reference rate of desirable inflation “below but close to 2 percent,” which contrasts with the Bank of England target of 2 percent with a symmetric tolerance band of 1 percent. The inflation rate in mid-2008 was still running high in Europe, the U.K., and the U.S. because of commodity price increases in the preceding year.

At the beginning of the current global crisis, Japan had the lowest policy interest rate because it had just escaped deflation. As the consumer price index (CPI) inflation rate had become positive, the Bank of Japan cautiously raised its policy rate, the call rate, from 0 percent to 0.25 percent in July 2006, and to 0.5 percent in February 2007. Just when the economy was thought to be out of deflation, the global crisis occurred. The BOJ only started to lower its interest rate after the Lehman collapse, cutting rates in October 2008 by 0.2 percentage point to 0.3 percent, and again by the same amount to 0.1 percent in December of that year. In the December decision, the BOJ also began paying interest

on excess reserves. The interest rate paid on excess reserves was set equal to the policy rate, 0.10 percent. The rate forms the floor in the interbank rate. Therefore this is virtually a zero interest rate policy, but with rates slightly above zero. As of September 2009, the inflation rate (excluding fresh food) is about -2 percent, so that the real interest rate has become positive. Therefore, Japan is again suffering from the zero interest rate bound as a constraint in its fight against deflation. The policy rate cuts by the four major central banks are shown in Figure 5.

So far, my description of the policy interest rate is in nominal terms. However, one should judge whether monetary policy is tight or loose using the *real* interest rate. For the U.S. and Japan this means when prices are declining and nominal rates are at the zero bound. Here, the inflation rate is defined as the percent change in CPI from 12 months earlier.⁸ Figure 6 shows the real interest rates of the four countries.

Figure 6 shows a picture quite different from Figure 5. The real interest rate in the United States and Japan declined sharply from June 2007 to July 2008 due to a sharply increasing inflation rate (in both countries) and aggressive cuts in the nominal interest rate (in the U.S. only). The real interest rates of the United States and Japan in July 2008 were well in the negative territory, with the United States at -3.6 percent and Japan at -1.8 percent. The real interest rates in the U.K. and the European Monetary Union had declined gradually from June 2007 to July 2008, but levels were still around positive 1 percent.

FIGURE 5
Policy Rates of the Fed, ECB, BOJ, and BOE

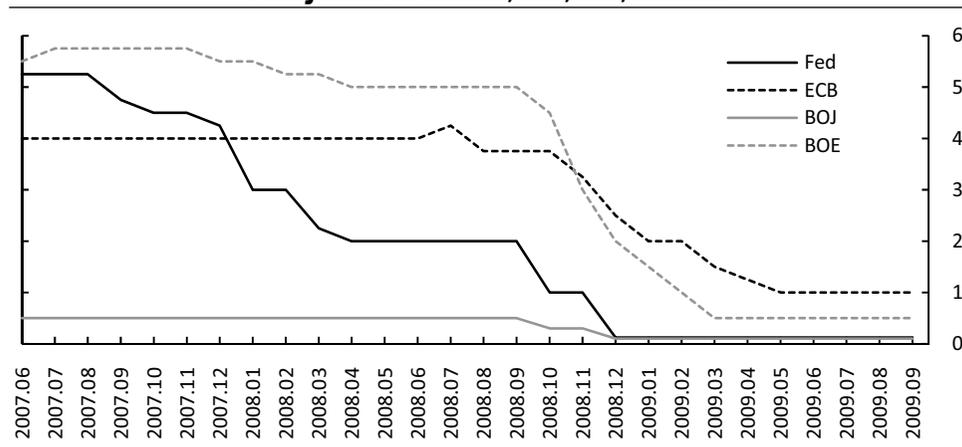
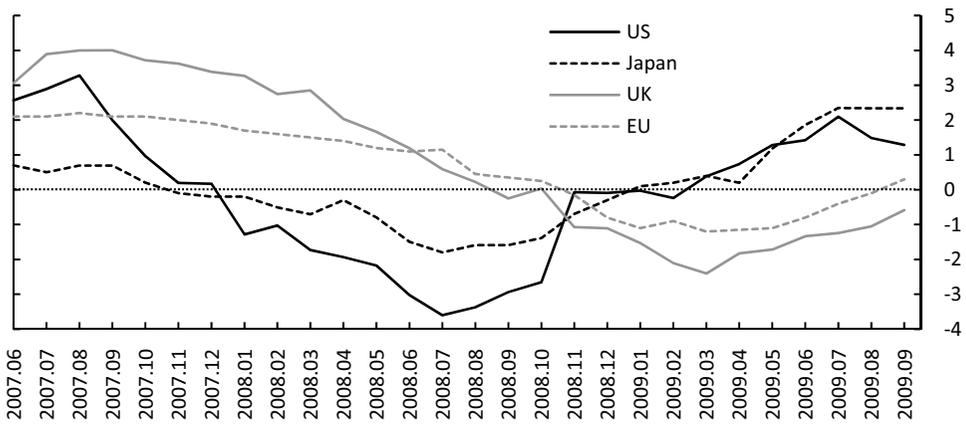


FIGURE 6
Real Interest Rates
 Policy Rate Minus CPI Inflation Rate, Backward 12 Months



The policy stance measured by the real interest rate changed dramatically after July 2008. Despite the Lehman failure and financial chaos, the real interest rate of the U.S. and Japan continued to rise from August 2008 to June 2009. The lowering of the policy rate in the two countries was far too small to offset declining inflation rates. Eventually, both policy rates hit the de facto zero interest rate bound. Conventional monetary policy then ceased to function by the end of 2008 in the two countries.

In the U.K. and euro area, real interest rates continued to decline until March 2009. The real interest rate became -1.2 percent for the euro area and -2.4 percent in the U.K. The monetary stimulus continued to work in the euro area and the United Kingdom. For the U.K., the inflation rate and the policy rate were around 5 percent, much higher than the other three areas in the summer of 2008, so it had substantial room to maneuver. Policy rate cuts were swift enough to mitigate the real and financial downturns in the United States and the United Kingdom. That could have been expected due to the desire to protect the large financial sectors in the two countries. The ECB was much more cautious. The BOJ never had room to lower rates any further.

3.2. (Un)conventional Monetary Policy: Balance Sheet Expansion

When the interest rate approaches zero, a central bank can still expand its balance sheet by providing more liquidity to the market. This can provide liquidity to financial institutions that face funding difficulties and provide increased incentives to banks to lend to corporate and household sectors. Expansion of the

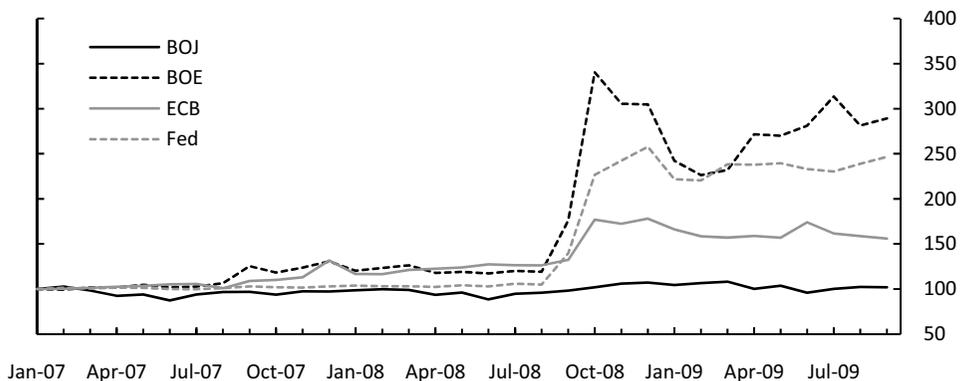
balance sheet itself does not necessarily constitute unconventional monetary policy. The policy becomes unconventional when a central bank broadens its purchases to include assets that are not purchased under normal circumstances.

The first central bank to attempt balance sheet expansion was the Bank of Japan. Japan had fallen into deflation and the BOJ struggled to find ways to stimulate the economy beyond its zero interest rate policy (ZIRP) during the 1999–2006 period.⁹ Specifically, within the ZIRP era, the BOJ targeted its current account balance (essentially the sum of commercial bank required and excess reserves) as a policy target from March 2001 to March 2006.¹⁰ This is known as the period of quantitative easing (QE). As reserves did not earn interest, when the Bank provided sufficient liquidity so that banks would hold excess reserves, the interbank interest rate was expected to fall to zero. So, QE was considered to be a further expansion step beyond the ZIRP.

In this crisis, both the Fed and the BOE aggressively expanded their balance sheets, much more than the BOJ during its QE era. The ECB also expanded its balance sheet, but to a much lesser extent. The Bank of Japan did not expand its balance sheet in any measurable way. An index of the balance sheet sizes of the four central banks, in ratio to the respective size of their balance sheets in January 2007, are shown in Figure 7.

The Fed doubled its balance sheet in the two months following the Lehman failure. The BOE's expansion of its balance sheet, which tripled over the same time period, was even more remarkable. The ECB also added about 50 percent to its euro-area consolidated balance sheet during this period.

FIGURE 7
Balance Sheets of Four Major Central Banks
 January 2007 = 100



The Fed called the action credit easing (CE), rather than quantitative easing, the name used earlier by the Bank of Japan and also by the Bank of England in this crisis. The difference between CE and QE will be examined in the next section.

In the pre-Lehman environment, the Fed was well prepared to combat the burst of the housing bubble and its deflationary impact. Chairman Ben Bernanke and the Federal Reserve staff had studied what happened in Japan and understood their options to avoid deflation.¹¹ Ahearne et al. (2002), Bernanke (2003), and Clouse et al. (2000) all studied and discussed the Japanese experiences and discussed the use of unconventional instruments. Bernanke (2002) expressed confidence in the ability of the United States to avoid deflation after the burst of the information technology bubble, and Bernanke (2003) argued that Japan could find ways to expand its balance sheet even at the zero interest rate, although he did express sympathy concerning the risk of asset deterioration of the central bank. However, he argued that this could be avoided through guarantees from the Ministry of Finance.

Among academics, Krugman (1998) offered the advice of generating expectations of higher-than-usual inflation rates during the phase of deflation so that the expected real interest rate would become even lower. Eggertsson and Woodford (2003) analyzed the issue of optimal monetary policy under the zero bound of the interest rate. They also argued that it is important to communicate the central bank's commitment to its future interest rate path.

Svensson (2001) provided a policy prescription for Japan that uses unsterilized intervention with a depreciated level of the target exchange rate. His "foolproof" way of getting out of deflation is based on promoting exports and importing inflation. However, the difficulty in applying Svensson's proposal to this crisis is obvious. The four major central banks had already adopted virtual ZIRP, so that there was little room to expect depreciation of the exchange rate from following the ZIRP.

So what would the expansion of the balance sheet do? The Bank of Japan during the 2001–06 episode argued that it contributed to flattening the yield curve by convincing the public that the ZIRP would continue a long time (known as the "policy duration effect").¹² In this crisis, the Bank of England argued that the expansion of the balance sheet would contribute to keeping the economy out of deflation.

3.3. Expectations Management

Even at zero interest rates, managing inflation expectations remains an important component of conventional monetary policy. As Krugman (1998) and

Eggertsson and Woodford (2003) emphasized, managing inflation expectations can prevent the forward-looking real interest rate from undesirable increases. For the inflation targeting central bank, e.g., the Bank of England, maintaining the inflation target and communicating the intention of achieving the target in the medium term can still act as an anchor for expectations during a crisis.

The fan chart of the Bank of England, which displays inflation projections, had in the past almost always predicted achievement of its 2 percent target with high probability over a two- to three-year horizon. However, at the height of the current crisis, the inflation reports of November 2008 and February 2009 contained fan charts that implied that achieving the 2 percent target within three years was unlikely. The most likely projection was that inflation would be around 1 percent by end of 2011, as shown in Figure 8A (reproduced from the Bank of England's *Inflation Report*). This posed quite a difficult situation for the central bank. Did the Bank of England abandon inflation targeting, or was it unable to achieve its target?

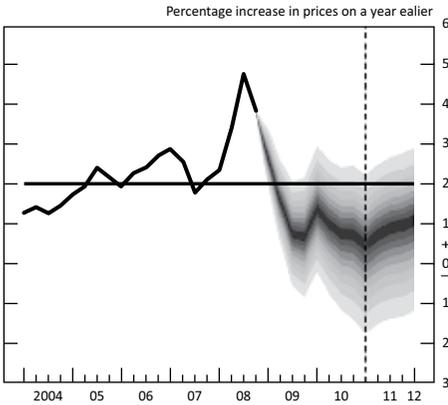
The Bank of England started to purchase high quality securities, including British government gilts in March, and subsequently raised its ceiling on purchases three times.¹³ In its August 2009 inflation report, the fan chart indicated that the 2 percent target would be achieved by mid-2011, based on the assumption that the policy rate would be maintained at 0.5 percent and the bank would purchase an additional £175 billion in assets (Figure 8B). However, the projection based on market expectations still indicated that the BOE would miss the target over the three-year horizon.

The BOE took advantage of its *Inflation Report* to anchor expectations, and its unconventional asset purchases were integrated into its inflation targeting framework. Under inflation targeting, a transition from conventional to unconventional policies could be easily communicated by articulating that without unconventional policy the inflation target would not be achieved. In addition, it would also be easy to rationalize the Bank's exit from unconventional policies by showing that, even without quantitative easing, the inflation target will be achieved.

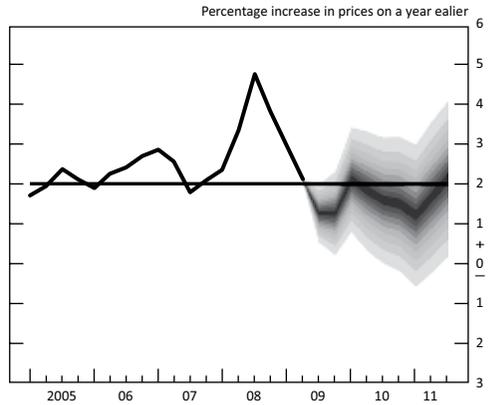
Expectations management posed a similar problem at the Federal Reserve. Although it does not explicitly target inflation, the Fed considers the appropriate inflation rate to be between 1 percent and 2 percent.¹⁴ The Federal Reserve does not publish an inflation report, but it produces a distribution of FOMC members' personal forecasts. Forecasts are shown twice a year at the time of the Monetary Policy Report to Congress (formerly the Humphrey-Hawkins testimony). In its February report (based on polls taken in January), the lower bound of its range of forecasts fell below 1 percent even over a three-year horizon (forecasts

FIGURE 8

**A Bank of England,
CPI Inflation Projection
Based on Market Interest
Rate Expectations**



**B CPI Inflation Projection Based on
Constant Nominal Interest Rates
at 0.5% and £175 Billion Asset
Purchases, August 2009**



Source: Bank of England, *Inflation Report*, February 2009.

for 2011). It had to be more than just a coincidence that in this report “long-run” forecasts were also surveyed, where long-run forecasts are defined as follows: “Longer-run projections represent each participant’s assessment of the rate to which each variable would be expected to *converge under appropriate monetary policy* and in the absence of further shocks to the economy.”¹⁵ This language is very close to those used by central banks under inflation targeting. According to the documents, the long-run projection, the central tendency range for inflation was [1.7, 2.0], while the range of all members was [1.5, 2.0]. The Federal Reserve felt adding these projections was important for managing expectations and communicating to the public. That logic is precisely the reason for having a numerical inflation target. It seems that the Federal Reserve, with its long-run projections, is now a step closer to adopting inflation targeting without declaring so explicitly.

The Bank of Japan publishes the Monetary Policy committee members’ forecasts twice a year. It had its inflation forecast in its April publication. According to the April 2009 forecasts for fiscal year 2010, the central tendency for inflation (trimming the max and the min) is [−1.1, −0.8] and the range of forecasts of all members is [−1.2, −0.4]. The forecasts were updated in October 2009, as follows: The majority viewed that the range of CPI inflation rate (excluding fresh food)

would be $[-0.9, -0.7]$ in 2010, and $[-0.7, -0.4]$ in 2011. It is remarkable to have a forecast of deflation for the next two to three years. There is no extra policy measure, like the QE pursued by the Bank of England. There is also no “long-run forecast,” like that given by the Federal Reserve, to show policymakers’ views on the desirable medium-term inflation rate. The Bank of Japan therefore shows no sign at this point of using expectation management to reduce forward-looking real interest rates.

3.4. Liquidity Support and Asset Purchase

Although the origin of the current crisis was in the United States, the securitized assets that caused these problems were distributed by European investment banks and bought by European investors. In contrast, there were only modest holdings of these assets in Asia.¹⁶ As discussed above, U.S. dollar swap lines were introduced as early as December 2007 with the ECB (\$20 billion) and the Swiss National Bank (\$4 billion). This was the first sign that the crisis had spread from the United States to the rest of the world. The U.S. dollar is the key international currency, at least in financial products and transactions.

Some European banks held large exposures to toxic assets (subprime related securities and other risky securitized assets). Other Western European banks had exposure to Hungary and Latvia, whose economies experienced difficulties from capital outflows. A large multinational banking group, Fortis, had balance sheet difficulties due to losses on its assets, and its Dutch operations had to be injected with capital in September, and then nationalized by the Netherlands government in October of 2008. The French government recapitalized Dexia at the end of September 2008, in cooperation with Belgium and Luxembourg.

In the first half of October, many banks became fragile worldwide and many countries announced comprehensive rescue packages. (See Panetta et al. 2009 for the list.) The concerted action was partly due to coordination under the G-7 on October 10, which established guidelines for assistance to systemically relevant institutions.

During the month of October, the flight to quality intensified, and the U.S. dollar appreciated against the euro as investors regarded it as a safe haven and as U.S. financial institutions accelerated their deleveraging efforts (repatriating dollars back to their U.S. headquarters). The U.S. dollar appreciated against almost all currencies except the Japanese yen. The yen appreciated due to the unwinding of carry trades, repaying outstanding yen-denominated debts incurred to invest in high-yielding currencies, such as the Australian dollar.

Panetta et al. (2009) provides a comprehensive survey of the various policy measures (including capital injections, liability guarantees, asset purchases, and asset guarantees) of 11 countries. They report that a total of €5 trillion has been committed and €2 trillion has been spent in the 11 countries. The outlay of U.K. assistance reached 44 percent of gross domestic product (GDP); that of the Netherlands reached 17 percent of GDP; while those of the U.S. and Japan reached 7.4 percent and 0.1 percent, respectively. Details are shown in Table 1. Panetta et al. (2009) conclude that, based on bank CDS premia, the market had regained stability by the end of May 2009, and they attribute this to the government interventions mentioned above.

The ECB started its liquidity provision in the aftermath of the Lehman failure. Its policy of enhancing credit provision and its effects on the spread are examined in Čihák, Harjes, and Stavrev (2009). Their conclusion is that the ECB expansion continued to operate during the global crisis. Policies included lengthening the maturity of monetary policy operations, providing liquidity at fixed rates, and reducing money market term spreads. They also concluded that the substantial increase in the ECB's balance sheet contributed to a reduction in government bond spreads.

On May 7, 2009, the ECB announced that it would start purchasing euro-denominated covered bonds issued in the euro area. Purchases would start in July, and the target amount would be €60 billion, to be completed by June 2010. The purchases would be directly from primary and secondary markets. High-grade assets (AA or above) are preferred.

3.5. International Monetary Fund

As risk aversion increased, institutional investors pulled their funds out of emerging market economies. Some institutional investors rushed to sell assets in emerging markets to repatriate their assets to their U.S. and European headquarters to raise liquidity—a form of deleveraging. Those countries that relied on capital inflows for real-sector investment were suddenly faced with shortages of U.S. dollar and euro-denominated assets to service their foreign debt obligations. This pattern has been repeated many times in recent history: Mexico in 1994, Asian countries in 1997–1998, Russia in 1998, Brazil in 1999–2000, and Argentina in 2001–2002, to name just the large crises. The International Monetary Fund (IMF) suddenly became busy again and received many requests for assistance.

Borrowers of IMF traditional stand-by arrangement (SBA) loans between September and December of 2008 included Georgia, Hungary, Iceland, and

TABLE 1
Overview of Commitments and Outlays of Rescuing Banks (€ billions)^a

	Capital injection	Debt guarantees ^a	Asset purchase	Asset guarantees ^a	Total	Total % of GDP	Total %, bank sector assets
Australia							
Commitments	—	UNS	—	—	UNS	UNS	UNS
Outlays	—	62	—	—	62	10.4%	4.6%
Canada							
Commitments	—	UNS	—	—	UNS	UNS	UNS
Outlays	—	0	—	—	—	—	—
France							
Commitments	43	320	—	5	368	18.9%	4.8%
Outlays	28	72	—	5	104	5.3%	1.4%
Germany ^b							
Commitments	80	420	UNS	200	700	28.1%	8.9%
Outlays	22	129	0	0	151	6.1%	1.9%
Italy ^c							
Commitments	20	UNS	—	—	UNS	UNS	UNS
Outlays	10	0	—	—	10	0.6%	0.3%
Japan							
Commitments	105	—	8	—	113	2.7%	0.9%
Outlays	3	—	0	—	3	0.1%	0%
Netherlands							
Commitments	37	200	—	28	265	44.6%	11.9%
Outlays	31	40	—	28	99	16.6%	4.4%
Spain							
Commitments	UNS	100	—	—	UNS	UNS	UNS
Outlays	0	31	—	—	31	2.8%	0.9%
Switzerland							
Commitments	4	UNS	27	—	UNS	UNS	UNS
Outlays	4	0	27	—	31	8.7%	1.5%
United Kingdom							
Commitments	54	269	—	523	845	54%	10.8%
Outlays	54	113	—	523	690	44.1%	8.8%
United States ^d							
Commitments	335	1760	115	281	2491	22.3%	25.5%
Outlays	237	271	36	281	825	7.4%	8.4%
Total Commitments ^e	677	3131	150	1036	4994	18.8%	8.3%
Total Outlays	387	719	64	836	2006	7.6%	3.3%

Notes: As of June 10, 2009, unless otherwise specified. UNS = unspecified amount; “—” = no program/action. Banking sector assets (as of the end of 2008) are consolidated data of the following: for Australia, banks, credit unions, building societies and corporations; for Canada, chartered banks; for Japan, depository corporations (banks and collectively managed trusts); for Switzerland, all domestic banks; for the five euro area countries and the U.K., monetary financial institutions; and for the U.S., commercial banks.

a Outlays indicate the value of liabilities/assets actually under government guarantee. Debt guarantee outlays comprise only bonds publicly issued up to May 29, except for Australia, where they indicate average daily outstanding amounts of both deposits and wholesale funding in May 2009; and except for the United States, where they include all outstanding FDIC-guaranteed liabilities as of May 31.

b Part of the €80 billion set aside for recapitalization can be used also for asset purchases.

c The commitment for capital injection indicates the upper bound of the global budget for the measure as approved by the European Commission; outlays include the intended (publicly announced) requests for funds not yet finalized.

d Figures exclude the capital injections to Freddie Mac and Fannie Mae and the \$700 billion TARP commitment to buy illiquid assets (later modified for other purposes); capital injection outlays are net of funds already repaid by the time of writing.

e Unspecified commitments are proxied by actual outlays.

Source: Panetta et al. 2009, table 1.2. <http://www.bis.org/publ/bppdf/bispap48.pdf>

Latvia, Armenia, Belarus, Bosnia, Romania, and Serbia joined the list in 2009. The IMF created a new facility, Flexible Credit Line (FCL) in March 2009 for countries with strong macro fundamentals but that could be hit by liquidity shortages in the near future. No conditionality for drawing the loan from the facility is attached. Mexico, Poland, and Colombia applied and qualified for FCL in April/May 2009.

3.6. The Real Economy and the Exchange Rate

Financial shocks became widespread in various directions: the U.S. real economy deteriorated, as did foreign exchange markets and both advanced and emerging foreign economies.

Consumption and investment had softened since the collapse of the housing bubble in the United States, and the financial troubles further dampened consumer and corporate activities. The GDP growth rate turned negative in the third quarter of 2008 and declined by more than 5 percent in both the fourth quarter of 2008 and the first quarter of 2009—a severe recession. The Lehman failure and the financial turmoil that followed made real activity plummet. High-end consumer durables, such as electronics and automobiles, were particularly hard hit.

The severe recession in the United States led U.S. imports to decline suddenly, and major exporters to the United States suffered. Postponed purchases of high-end consumer electronics and automobiles hit Japan and Germany disproportionately, with German exports declining significantly. Japan experienced unprecedented declines in industrial production and manufactured exports. Japanese economic growth was lowest among the G-7 countries.

Japan experienced sudden large declines in stock prices, appreciation in the yen, and sudden declines in exports in the fourth quarter of 2008 and the first quarter of 2009. The Japanese declines in GDP and industrial production from October 2008 to March 2009 were the largest among major industrial countries. This is puzzling, since Japanese institutions and investors had held little exposure to the problematic securitized assets that started the crisis.

The government tried to stimulate the economy by introducing several fiscal programs. With the policy interest rate already at 0.5 percent, the BOJ could not produce any additional stimulative measures. The balance sheet expansions and excess reserve targeting that was employed from 2001 to 2006 were not revived at this time. Japan experienced a -3 percent quarter-to-quarter growth rate over two consecutive quarters. Japanese banks, which had little exposure to toxic assets, started to feel pressure in the first quarter of 2009, as stock prices continued to decline and the real domestic economy declined as

well. Some of them recapitalized themselves, diluting the value of holdings by existing shareholders. However, they were not in sufficiently poor condition to request government capital injections or other forms of assistance.

The large shock spilled over to foreign exchange markets. The U.S. dollar appreciated against almost all currencies including the euro, the British pound, and commodity-based currencies. It was unusual that the currency of the country where the crisis originated appreciated during the crisis. This is explained by the fact that many troubled institutions needed U.S. dollars to settle their dollar-denominated contracts and to repatriate their assets to shore up domestic headquarter balance sheets. The only currency that appreciated against the U.S. dollar was the Japanese yen. This was explained by two forces: the unwinding of carry trades and reductions in losses by Japanese retail investors in high-yielding currencies that overwhelmed the repatriation of U.S. financial institutions.

4. Assessment of the Key Policy Responses

4.1. Quantitative Easing vs. Credit Easing

The similarities and differences between quantitative easing (QE), adopted by the Bank of Japan from 2001 to 2006, and the credit easing (CE) policy pursued by the Federal Reserve have been explained by Bernanke (2009).¹⁷ Let me paraphrase his points (all quoted statements in the following several paragraphs are his). Both QE and CE expand the central bank's balance sheet. However, the difference is which side of the central bank's balance sheet is emphasized. The pure form of QE emphasizes the liability side, while the focus of CE is the composition of central bank's assets.

In March 2001, the BOJ replaced the call rate as the policy target with the amount of its current accounts, essentially the excess reserves of financial institutions. The asset side, that is the composition of loans and securities, was then "incidental." The Federal Reserve's CE "focuses on the mix of loans and securities that it holds and on how this composition of assets affects credit conditions for households and businesses." The difference, as Bernanke explained, stems from the difference in financial and economic conditions of Japan in 2001–06 and the U.S. in 2008: "credit spreads are much wider and credit markets more dysfunctional in the United States today than was the case during the Japanese experiment with quantitative easing." The stated policy objective of the Fed's CE is "reducing those spreads and improving the functioning of private credit markets more generally."

When QE was adopted by the Bank of Japan in March 2001, the transmission channels from expanding the central bank balance sheet to stimulate economic activity were not controversial. First, flooding the market with liquidity stabilizes the banking system by erasing the fear that a bank may fail due to a lack of liquidity (as opposed to insolvency). Second, QE may reduce long rates if it contributes to a reduction in short-term rates that will prevail in the future. Long rates are more relevant to stimulating investment activities. The expectation of future ZIRP is also strengthened by clarification of a bank's "exit condition," the characteristics under which the central bank will begin to remove stimulus. This channel is called the "policy duration effect." Third, QE may encourage financial institutions to accept more risks by lending to less creditworthy customers or by purchasing riskier securities such as equities and foreign-currency-denominated securities. These would raise stock prices and depreciate the yen, as well as help small- and medium-sized enterprises (SMEs) survive, encourage venture capital extensions, and make it easier to restructure nonperforming loans. This channel can be called the bank lending channel. Fourth, risk-taking behavior among institutional investors and retail customers may increase due to looser bank lending policies. Again, equities and foreign-currency-denominated securities are likely choices. Thus, QE was a commitment strategy that created expectations of sustained ZIRP going forward. This policy might also have encouraged pursuit of the "carry trade" and led to yen depreciation.

Arguing for this last channel, Svensson (2001) advocated a "foolproof" way of stimulating the economy under ZIRP by conducting targeted depreciation of the currency backed by unlimited unsterilized intervention. Although Japan engaged in massive intervention from January 2003 to March 2004, in parallel with expansion of the Bank of Japan balance sheet, both the Ministry of Finance and the Bank of Japan denied that they were following Svensson's advice: Deputy Governor Kazumasa Iwata once claimed that the simultaneity of the government's intervention and QE were purely a coincidence.

What are the assessments of the effectiveness of various QE transmission channels? There is near consensus that it contributed to financial stability. Beyond financial stability, many agree that the BOJ QE program had a "policy duration" effect and contributed to the flattening of the yield curve.¹⁸ There is some evidence of yen depreciation through the carry trade, but it would be difficult to assess an incremental effect of QE beyond the ZIRP. Most controversial is the bank lending channel. There is little evidence, empirical or anecdotal, that banks lent more because of QE. Banks were worried about their liquidity positions and their capital ratios in 2002–03.¹⁹

In the credit easing policy, the focus is to restore a dysfunctional bank credit market and to restore the market mechanism in the securities market. This can be better analyzed in the framework of a credit channel of monetary policy. The credit channel, as surveyed in Bernanke, Gertler, and Gilchrist (1999), emphasizes bank lending and firms' usage of the funds in profitable projects. The credit channel links credit quality, bank health, and firms' available resources, and explains how business cycles can be driven by bank credit availability. If the current global crisis is an extreme form of a business downturn, rather than the result of some structural breaks, part of the difficulties must have followed the process described by the credit channel model. Indeed, the large movement of various market interest rate spreads, such as the TED spread and the Libor-OIS spread, can be interpreted as a credit problem in the banking sector that affects bank lending.

One of the stated objectives of credit easing is to restore normal spreads in the credit market. How monetary policy responds to increased credit spreads and whether monetary policy can influence these spreads is a topic of recent investigation.²⁰

Bernanke (2009) argues that it is not possible to set a single number, like the Bank of Japan did, for the size of the balance sheet. In the regime of credit easing, the desirable amount of asset purchases is more driven by demand. He admits that this poses a communication challenge. In response he emphasizes that the central bank should be transparent about its credit easing strategy.

I have four observations about and interpretations of the difference between QE and CE. First, since the effectiveness of the BOJ QE in the 2001–06 episode is somewhat controversial, this might have been a reason for Chairman Bernanke to choose a different name for the Fed. However, Governor Mervyn King of the Bank of England designated his policy as quantitative easing.

Second, the reduction in mid- and long-term rates had a positive effect on the economy. A similar effect could also be achieved by creating expectations that the ZIRP would be maintained even after the standard policy rule prescribed a rate rise. This could be managed through communication and need not involve expanding the central bank's balance sheet.

Third, Japan suffered acute difficulties in financial and capital markets, similar to the U.S. markets' post-Lehman months, in November 1997 when a major bank and one large and one medium-sized securities firm all failed. The Japanese banks suffered from the "Japan premium," a widened spread for Japanese banks in the dollar interbank markets. There was a widespread credit crunch. Since Japan had and still has a more bank-based financial system

than the United States, this credit crunch had a major impact on the economy. Purchasing various securities, similar to CE, would have had little impact.

Fourth, although Chairman Bernanke dismissed the importance of the asset side considerations of the Bank of Japan's QE policy, the policy did expand the scope of assets admissible as collateral, including corporate bonds and commercial paper. The Bank of Japan also purchased more than ¥2 trillion worth of equities from commercial banks but stressed that this action was not a part of monetary policy, but was intended to address systemic stability.²¹

Shiratsuka (2009) argues that circumstances, including the crisis origin and the way spillovers occurred, were quite different in Japan in 2001–06 than in the United States in 2007–09. A simple comparison of CE and QE policies is therefore difficult. He argues, however, that the BOJ already had employed various unconventional measures, such as purchases of CP and government bonds, which were repeated by the Fed in this crisis.

4.2. Governance and Transparency

Unconventional monetary policy also posed challenges to central banks, the Federal Reserve in particular. After the Lehman failure, several important decisions were made at the Fed, including the creation of facilities to provide financial institutions with liquidity. These unconventional policies were technically not under the auspices of the FOMC, which includes the governors and the regional bank presidents. The unconventional monetary policy measures were instead adopted by the governors of the Federal Reserve Board under Section 13(3).

The Federal Reserve Act says: “In unusual and exigent circumstances, the Board of Governors of the Federal Reserve System, by the affirmative vote of not less than five members, may authorize any Federal Reserve bank, during such periods as the said board may determine, at rates established in accordance with the provisions of section 14, subdivision (d), of this Act, to discount for any individual, partnership, or corporation, notes, drafts, and bills of exchange when such notes, drafts, and bills of exchange are endorsed or otherwise secured to the satisfaction of the Federal Reserve bank.”²²

As a result, as monetary policy moved from conventional to unconventional policy, power shifted from the presidents of the regional banks to the governors in Washington, D.C. In light of the need for a quick response, this may have been necessary and desirable. However, it posed some governance and transparency questions. For example, no minutes were released concerning the Section 13(3) decisions.

In the Bank of Japan and the Bank of England, the discussions and decisions of unconventional measures were made by the same body that determines monetary policy. Therefore unconventional policies were as transparent as conventional measures.²³

5. Lender of Last Resort and Too-Big-to-Fail

5.1. What Should Have Been Done between March and September 2008

The success of crisis management in dealing with the Bear Stearns failure in March 2008 became a medium-term curse. After Bear Stearns was rescued with assistance from the Federal Reserve, market calm was quickly restored, although spread levels did not go back down to rates that prevailed before the Bear Stearns fall. U.S. and European financial institutions were already deleveraging to shrink their balance sheets.

The Bear Stearns failure had two important effects on market sentiment. First, many market participants and observers realized that investment banks were in serious financial condition. Second, the rescue assured the public that the Treasury and the Fed were prepared to take extraordinary actions to prevent the demise of financial institutions. Counterparties would be protected and no financial meltdowns would be avoided. The relatively small reactions of spreads demonstrates this latter effect.

The bailout generated moral hazard among investors and banks by assuring them risks were limited because the government would rescue a failed institution. In particular, many market participants and observers believed that “too-big-to-fail” policies would apply to investment banks that were larger than Bear Stearns. The bailout also generated complacency among regulators that a future crisis could be averted if problems arose. Some observers criticized the lenient terms for shareholders, but officials defended the bailout by saying that it was the only option since time was pressed.

The Bear Stearns bailout was defensible. However, because it was the first large sudden failure, efforts to achieve regulatory reform after the bailout were insufficient. There could have been calls for a resolution mechanism that would be tougher on the next failing financial institutions. Careful policy analysts, looking at CDS spreads, would have known that there was a good chance that another large institution could fail, raising the need for such a resolution mechanism.

At the Federal Reserve, more efforts were given to the implementation of facilities to provide more liquidity by expanding the set of qualifying institutions and assets admissible as collateral. Before September 2008, most adverse

problems were concentrated in subprime markets and securities that were based on subprime mortgage paper. They were created, sold, and primarily held by institutions in the United States and Europe. Policy responses were mostly restricted to conventional policies, such as the reduction in interest rates in the United States. Several unconventional policy responses were employed in the United States: the creation of the TAF in December 2007; the rescue operation of Bear Stearns and creation of the TSLF and PDCF in March 2008; and the explicit government guarantee of GSEs.

5.2. Shouldn't Lehman Brothers Have Been Saved?

With all these indications, the Lehman Brothers collapse was a watershed. Clearly, conditions that followed the collapse were undesirable. More bluntly, letting Lehman Brothers file for Chapter 11 was a mistake. However, many observers differ on what should have been done and what could have been done. Below I summarize some of the arguments critical of the policy pursued by the Treasury and the Federal Reserve, as well as arguments in defense of their policies.

Naive criticism (by a lender-of-last-resort believer) might go as follows: Given the financial turmoil that was caused by the collapse of Lehman Brothers, it should have been saved by a Bear Stearns-like rescue. In short, sufficient government capital injections to avoid a failure should have been provided. “No sweetener” was too abrupt a policy change, given that markets expected a bailout. The ultimate cost to taxpayers of the financial meltdown that occurred in the wake of Lehman’s failure turned out to be much higher than the amount of assistance that would have been required.

Defense of Treasury actions would note that there are three differences between the Bear Stearns case and the Lehman Brothers case. First, some derivative positions were unwound on Sunday, so that systemic risk was expected to be minimized. Second, the deterioration in Bear Stearns’s liquidity position took place suddenly, so it lacked adequate time to cope with the change in financial environment and regulators were caught off guard. As such, it was reasonable in that case to extend loss guarantees. Third, after the rescue merger of Bear Stearns, two new facilities, the TSLF and the PDCF, were introduced, so that a mechanism existed for Lehman to raise liquidity. Fourth, financial assistance to Bear Stearns had created a sense that rescues would be assisted by government support. A line had to be drawn somewhere to avoid increased moral hazard.

Against this line of defense, further criticism would go as follows: It may be true that Lehman Brothers management was at fault, but management

failure should not be the criterion for deciding whether a systemically important institution should be rescued. Moral hazard might be evident because the Bear Stearns rescue created a notion that any investment bank larger than Bear Stearns would be rescued. So counterparty risk was not heightened, as shown in earlier sections. If the Treasury and Fed intended to “draw a line,” it should have come immediately after the rescue of Bear Stearns, emphasizing it had been an exceptional case and would not be repeated. Instead, a policy shift toward preventing moral hazard seems to have arisen only after criticism of the Bear Stearns rescue. When the Treasury entered negotiations for the acquisition of Lehman Brothers just days before the weekend of September 13, the potential suitors must have expected that similar government assistance would be added to a Lehman rescue deal. By refusing to provide this assistance, the Treasury triggered a financial panic. Ironically, once panic began, the Treasury and the Fed provided “lifeboats” to many institutions, including AIG, Citigroup, and Bank of America.

Even if Lehman Brothers was allowed to fail, Chapter 11 was the worst framework for closing a financial institution. Under Chapter 11, the bankruptcy court freezes assets, while the institution is protected from creditors. All claims on the institution needed to be categorized and sorted out prior to disbursement. This temporary freeze on liability payments, particularly short-term liabilities in swap agreements, derivatives, collateral, and primary brokerage contracts (basically customers’ assets in care of the securities firm), it raised the possibility of a financial meltdown. Many of the financial difficulties experienced by other investment banks, institutional investors, and hedge funds were rooted in this asset freeze and protection from creditors.

There is another international dimension to this failure. Immediately after Lehman’s filing of Chapter 11 in the United States, its subsidiaries filed similar bankruptcy/rehabilitation plans in Japan and the U.K. Accordingly, financial regulators in those countries ordered that Lehman subsidiaries’ assets to be frozen within each country’s borders, fearing that assets would be siphoned from each country to the United States. Bankruptcy laws in the three countries have different details, and it became difficult for a subsidiary to resolve its organization within each jurisdiction. Japanese assets that belonged to customers in swap arrangements with New York or London faced difficulties in unwinding those obligations. Even a year later, many assets are still frozen and lawyers in London, New York, and Tokyo are trying to sort out how to settle claims.

In bankruptcy law, proprietary trading and trading accounts for customers are separated, and the latter is fully protected in bankrupt securities firms.

It took months to return those assets to customers. Even a delay of a few days may be too late for some of the institutional investors that faced redemptions and withdrawals of funds from their retail customers.

Considering all these difficulties, it would have been much better if the government nationalized Lehman Brothers and kept honoring short-term liabilities, unwinding swap arrangements, and returning assets of customers in consignment within days if not hours. Long-term debts and bonds should have been dealt with separately, and shareholders' values could have been limited to remaining values in the company, if any.

Defenders of the U.S. government action would say that there was no legal framework for the government to take over a financial institution like that. However, the fact that a majority share of AIG was acquired by the government very quickly, *de facto* nationalization, shows that it seems possible for the government to take over a (near-)insolvent financial institution if the government is determined to do so. More fundamentally, Section 13(3) can be invoked to create the necessary facilities, just like it was for AIG.

5.3. Should AIG Have Been Saved?

In contrast to Lehman Brothers, the AIG rescue—first with an \$85 billion loan from the Federal Reserve and later with an additional capital injection—was carried out smoothly. As shown in an earlier section, the CDS premium for AIG was much higher than Lehman Brothers on the Friday before the crisis weekend. Why was AIG saved and not Lehman Brothers? The source of the AIG problem was the CDS contracts that AIG provided, and it was believed that if AIG defaulted on those CDS contracts, counterparties would suffer massive losses.

Was this much worse systemic risk than allowing Lehman Brothers to fail? CDS contracts do not carry immediate cash flow problems analogous to the overnight interbank market. CDSs are not traded in centralized markets, but over the counter. The problems that would follow CDS contract defaults were not well understood. So, on the cautious side, the \$85 billion loan on September 16 may be justified.

When the loan was restructured later in November 2009, with the creation of the Maiden Lane III facility, the CDS contracts were paid in full. The so-called SIGTARP report, from the Office of the Special Inspector General for the Troubled Asset Relief Program (2009), questioned the need to pay contracts in full to protect the counterparties. There was also widespread criticism of the AIG executive bonuses in the spring of 2009.

5.4. Bank Restructuring: Conventional Wisdom and Practices

A rich literature exists on how to manage and exit a banking crisis.²⁴ Best practices have been learned from the experiences of the U.S. S&L crisis in the 1980s, the Nordic banking crisis in the early 1990s, the Asian financial crisis of 1997–98, and the Japanese banking crisis in 1997–2003, to name a few.

When a bank is short on liquidity, providing additional liquidity by accepting a wider range of assets as collateral is a useful first step. When counterparty risk increases, such liquidity provision by the central bank is not uncommon. In the extreme case, providing liquidity becomes a lender-of-last-resort operation. An important point here is that the central bank has to be sure that shortage is due to illiquidity, not a shortage of capital. Liquidity crises can be helped by liquidity provision, but insolvency (a negative capital position) cannot. During a crisis, it is very difficult to differentiate the two. Liquidity provision has been used many times in many countries, sometimes successfully, but more often resulting in insolvency. In the current global crisis, many “facilities” created by the Fed fall into the category of liquidity provision. The ECB, the BOE, and the BOJ also expanded asset purchases from the market and from commercial banks directly, helping to provide liquidity to banks, albeit at smaller magnitudes.

When a crisis is due to deterioration in asset quality, a different solution has to be sought. If nonperforming loans and valuation losses become excessive, the government may have to inject capital, either by purchasing subordinated debts or by purchasing new issues of bank common shares. Capital injections were tried twice for major banks during the Japanese banking crisis of 1997–98, and in the current global crisis in many countries.²⁵ The problem with capital injection is that governments tend to be shy about taking management control. Because the government does not take control, banks tend not to make drastic reforms. If the government offers funds tied to stringent restrictions, no bank applies for the funds.²⁶ So, the government tends to force several major banks—regardless of their capital positions—to accept injections. This was the case in March 1998 in Japan and in October 2008 in the United States. However, if a stringent condition is imposed (such as a cap on executive bonuses), banks will try to repay injected capital quickly, whether they still need it or not. This happened in the United States during the current crisis.

Capital injection may also have the unintended side effect that banks receiving injections may not undertake serious reform efforts, such as writing off nonperforming loans or divesting of bad assets, unless they are required to at the time of the capital injection. This was the case in Japan from 1999 to 2002, when

complacency led to the erosion of capital positions. The United States also failed to convince banks to take advantage of TARP because banks did not want to sell assets at what they considered “fire sale” prices. Without due diligence, either asset examinations or stress tests, the government is likely to end up buying bad assets at banks’ offer prices, which undoubtedly are inflated. This is the fundamental problem of hasty capital injections without due diligence and the threat of nationalization.

Blanket guarantees of deposits are often necessary to avoid a bank run. Japan introduced a blanket guarantee as early as 1995, while the serious crisis did not erupt until 1997. Even during the protracted banking crisis, there was no bank run in Japan. The United Kingdom hesitated to provide a blanket guarantee when the fragility of Northern Rock became known in the fall of 2007. The existing ceiling for guarantees was low, and a bank run occurred against Northern Rock, resulting in nationalization in February 2008. This was a costly episode since it eroded confidence in Britain’s financial regulators. During the Asian crisis, Indonesia closed 16 banks without full guarantees of deposits, which caused bank runs and capital flight.²⁷ During the current crisis, Sweden increased the ceiling of deposit guarantees to SEK500,000 on October 6, 2008, and Switzerland did the same up to CHF100,000 on November 5. On October 5, the German government guaranteed all private bank deposits. On September 30, deposits in six large banks in Ireland were guaranteed by the government. This was an enhancement from an increase in the deposit insurance ceiling to €100,000 only 10 days earlier.

In addition to deposits, other liabilities of banks can be guaranteed by the government if and when counterparty risk becomes unreasonably high. In order to maintain the interbank market and to avoid systemic risk, the government may choose to guarantee these liabilities. In the current crisis, the German government and SoFFin (the financial stabilization fund) extended guarantees to several large institutions.

When a financial institution is insolvent or near insolvency, in many cases the government will prefer to take it over and restructure it, rather than allowing it to be liquidated. Suddenly shutting down large financial institutions (or entering into bankruptcy proceedings) increases the risk of systemic risk and a financial meltdown. This was what happened in the case of Lehman’s filing for Chapter 11. Temporary nationalization (or a publicly arranged orderly resolution) makes it possible to resolve an institution without causing stress to short-term creditors and derivative counterparties, and while shareholders and management can still be held responsible. Hesitation on the part of the government is understandable, because nationalization may be widely criticized.

Critics might argue that nationalization, even if it is temporary, would destroy confidence in the free market. They may also argue that the government is not competent to run a large complex bank. There may also be conflicts of interest if the government or public corporations are borrowers from the bank. However, nationalization brings opportunities to pursue drastic reforms, engage in quick sales of noncore assets, reduce wages and legacy costs, and separate distressed assets to a bad bank. Nationalization and separating bad assets worked during the S&L crisis of the United States, the Japanese banking crisis from 1997 to 2003, and the Asian financial crisis (Korea, Indonesia, and Thailand).

It is well recognized that separating distressed assets—nonperforming loans in the Japanese context and toxic assets in the U.S. context—is key in reviving the health of troubled banks. However, it is difficult to convince banks to sell their distressed assets against their will unless the government has the power to threaten nationalization. Sometimes, not just the threat, but actual nationalization is needed to arrive at a good bank–bad bank solution.²⁸ This was shown to be true during the S&L crisis in the 1980s, the Nordic crisis of the early 1990s, and in the Indonesian, Thai, and Korean crisis in 1997–98.²⁹

The failure to use TARP money in the United States for its original purpose was attributable to the government's inability to force banks to sell toxic assets. Valuation is inherently difficult when markets have dried up. The gap between sellers' desired prices and those that would have met the buyers' responsibilities to the taxpayers could not have been bridged. If banking fragility arises again in the United States, the perceived hesitation of its government to nationalize banks makes it difficult to force the separation of banks and their toxic assets.

5.5. Summary

My major assessments of the policy responses are as follows:

- Credit easing, as well as conventional policy, by the Fed has been very successful in avoiding the worst possible situation—a meltdown of the financial markets—in the wake of Lehman Brothers' failure.
- Various unconventional measures employed by European financial authorities were effective in providing liquidity and averting large-scale financial problems. Some of the early nationalization and liability guarantees maintained systemic stability.
- Although unconventional policies had high costs, during the crisis they played a large role in avoiding financial disaster.
- Letting Lehman Brothers file for Chapter 11 was a mistake. Instead, the six months between March 2008 and September 2008 should have been

used not only for “firefighting,” but also for institutional overhaul in anticipation of the insolvency of some large, complex financial institutions.

- The terms of the resolution of AIG, paying full value of CDSs to counterparties, has been questioned.
- Inflation targeting is an effective tool for expectations management and communication, even during the phase of ZIRP.

6. Remaining Challenges

As argued in the end of Section 2, the financial markets and institutions regained normalcy in terms of risk spreads and CDS premia. However, this may still be dependent on continuing conventional and unconventional monetary policies. How to exit from ZIRP, CE/QE, and all other guarantees and injected capital is obviously a difficult challenge that will be faced in the coming months. However, it would be prudent to err on the side of late exit given what the market has experienced since September 2008. Moreover, deflation may be more of a risk than inflation. Critics may point out that the last episode of keeping the interest rate low in the aftermath of the bursting of the tech bubble might have sown the seeds for the housing bubble (e.g., Taylor 2009). And they conclude that exit must not be delayed. However, at this moment there is no sign of the formation of another bubble due to ZIRP. The worry is misguided. Of course, as a long-run issue, it is important to examine whether and how monetary policy should respond to asset prices.

One of the main reasons for the subprime crisis in the United States was its antiquated regulatory framework—fragmented, duplicated, and with cracks. Investment banks were not effectively regulated by the Securities and Exchange Commission, and multiple regulators invited regulatory arbitrage. Currently, there is a proposal to give more power to the Federal Reserve to supervise systemically important financial institutions. The issue of whether an independent supervisor, such as the Financial Services Authority (FSA), is most effective in regulation and supervision, or whether responsibility is best held by the central bank has been debated in policy circles. The United Kingdom, Japan, Australia, and Korea, among others, chose a model of an independent FSA, while several continental European countries have a hybrid of federal regulator and national central bank.

When normalcy in the financial market is restored and the supervision framework is straightened out, the fundamental question of how to avoid “too-big-to-fail” policy while maintaining systemic stability has to be debated. In order to avoid too big to fail, the government must be able to nationalize large, complex, internationally active financial institutions for orderly resolution.

However, if the government-led resolution frameworks for Europe, the United States, and Asia are not coordinated, resolution becomes difficult.

Now that the G-20 is a permanent forum for discussing financial architecture, leadership in G-20 is needed to steer discussions into a direction of relevance. Engaging important emerging market economies is important, but 20 may be too large a number for effective discussions.

The IMF is again being criticized that it may be overlooking signs of vulnerability among emerging markets that are now under its programs—Iceland, Hungary, Belarus, and Latvia, to name a few. Could it ever be possible to create an effective early warning model? The call for early warning was heard in the aftermath of the Mexican crisis of 1994, again after the Asian crisis, and this time. If every crisis is different, it is almost impossible to predict a crisis. On the other hand, too much short-term debt in comparison to foreign reserves seems to be a robust indicator for vulnerability. This was recognized by Asian countries, and they have piled up foreign reserves since 2000. It seems their accumulating foreign reserves, however costly in terms of fiscal operations, has proven worthwhile in the avoidance of crisis in East Asia during the current global crisis.

The G-20 and the IMF should shift their focus to establishing a global resolution mechanism for large, complex, internationally active financial institutions, in order to avoid moral hazard while maintaining systemic stability. This is the most important lesson from Lehman's filing for Chapter 11, and the most important lesson for global financial supervision and regulation in the future.

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NOTES

1 Taylor (2009) argues that the financial market turbulence was primarily attributable to counterparty risk, rather than illiquidity, since the Libor-OIS spread highly correlates with the Libor-repo spread, which measures counterparty risk more directly. Here, the TED spread is used to make the same argument.

2 In the aftermath of the banking crisis of November 1997 in Japan, the so-called Japan premium increased sharply. Western banks demanded higher interest rates on Japanese banks who wanted to borrow U.S. dollars. See Ito and Harada (2004, 2005) for the Japanese experiences of the banking crisis from 1997-2003.

3 Both Libor and the OIS rates are influenced by expectations about future interest rate movements but spreads difference out movements in interest rate expectations.

4 Many conversations with market participants confirm that few expected a Lehman failure on the Friday before the negotiation weekend. McDonald and Robinson (2009) also describe similar sentiments inside the company.

5 Accounts of the last hours of the negotiation have been reported by well-informed journalists. See Elliott and Treanor (2009) and Sorkin (2009).

6 For the decision under Section 13(3), only five governors of the Federal Reserve Board are needed to make decisions. Presidents of regional Federal Reserve Banks do not participate in the discussion or voting.

7 This may be a reaction to the fact that maintaining the (average) policy rate at the target level had become increasingly difficult due to the heterogeneity of market participants.

8 Of course, the correct inflation rate may be the forward-looking expected inflation rate. However, timely comparable observations of the expected inflation rate are difficult to obtain. The exact price index for policy purposes may also be different from the headline CPI inflation rate. For example, the United States uses the personal consumption expenditures (PCE) inflation rate, and Japan uses the CPI excluding fresh food (but including energy prices). However, again for comparability, I use headline CPI inflation for the four countries.

9 The BOJ briefly moved into positive interest rate territory between August 2000 and March 2001.

10 In March 2006, the policy target was switched from the current account balance at the BOJ to the call rate, which was set at 0 percent. The 0 percent call rate target was maintained until July 2006.

11 See Bernanke (1983) on the Great Depression.

12 See Oda and Ueda (2007), Okina and Shiratsuka (2004), and Ueda (2005) for descriptions and examinations of the policy duration effect.

13 The BOE increased its ceiling of purchase from £75 billion in March 2009 to £125 in May, to £175 in August, and to £200 in November. The balance stood at £158.4 billion on October 1, 2009.

14 Chairman Bernanke once referred to this range as a “comfort zone.”

15 From a footnote of the table of the projection, with emphasis added by the author; see Board of Governors (2009), p. 43.

16 There were only two Japanese financial institutions that reported any sizable exposures to these problematic assets, and the size of their holdings was small compared to their total size of the assets. There were a few incidents, such as the case of “Lehman mini-bonds” marketed to retail customers in Hong Kong and Singapore.

17 “Our approach—which could be described as ‘credit easing’—resembles quantitative easing in one respect: It involves an expansion of the central bank’s balance sheet. However, in a pure QE regime, the focus of policy is the quantity of bank reserves, which are liabilities of the central bank; the composition of loans and securities on the asset side of the central bank’s balance sheet is incidental. Indeed, although the Bank of Japan’s policy approach during the QE period was quite multifaceted, the overall stance of its policy was gauged primarily in terms of its target for bank reserves. In contrast, the Federal Reserve’s credit easing approach focuses on the mix of loans and securities that it holds and on how this composition of assets affects credit conditions for households and businesses.” Bernanke (2009).

18 See Ito (2004) for controversies in Japan over the adoption of QE, the non-adoption of inflation targeting, and the effectiveness of QE. See Oda and Ueda (2007) for policy duration effects.

19 The core capital of major banks was steadily eroded from 1999, when capital injection took place, to 2002, and they found that a large proportion of their Tier I capital was replaced by “tax deferred assets.” The new FSA minister Takenaka in October 2002 threatened banks with nationalization and forced them to raise capital. He was reported to have said that “no bank is too big to fail.”

20 Taylor (2008) and Cúrdia and Woodford (2009) investigated whether a central bank should respond to the market credit spreads. By modifying the conventional Taylor rule to include the credit spread, Taylor showed that the Fed action of rapid easing in the current crisis can be better explained. This was named the spread-adjusted Taylor rule. Sudo and Teranishi (2008) and Teranishi (2009) showed that under some circumstances, the spread-adjusted Taylor rule is an optimal monetary policy rule. In particular, Teranishi (2009) showed that the spread-adjusted Taylor rule is consistent with optimal monetary policy under heterogeneous loan interest rate contracts in both discretionary and commitment strategies, and that a commitment policy is effective in narrowing the credit spread when the central bank hits the zero lower bound constraint.

21 See Ito (2004, p. 239) for detailed accounts of the Bank of Japan policy.

22 Federal Reserve Act, Section 13(3).

23 The ECB does not issue minutes of monetary policy discussions or discussions about unconventional measures.

24 For example, see Caprio, et al. (1998), Hausmann and Rojas-Suárez (1996), Ito and Hashimoto (2007), and Reinhart and Rogoff (2008).

25 See Cargill, Hutchison, and Ito (2000) for the experiences of the Japanese banks.

26 Banks also shy away from acquiring funds with stringent restrictions because of a “stigma issue.” They fear the market will think the banks that accepted the funds were in worse financial shape.

27 See Ito (2007) for a critical review of the “prior condition” for the IMF program for Indonesia on October 31, 1997.

28 Schäfer and Zimmermann (2009) argue that “bad banks and nationalization are not alternatives but rather two sides of the same coin.”

29 See Ito and Hashimoto (2007).

COMMENTARY
**Fire, Flood, and Lifeboats:
Policy Responses to the Global Crisis of 2007–09**

Frederic S. Mishkin

The story of the recent financial crisis that Taka Ito tells in his paper is one that I mostly agree with and so my role as a discussant will be to add some nuances to the story he tells. There are two issues I would like to address. First is whether Taka puts too much emphasis on the Lehman Brothers collapse in his discussion of the evolution of the financial crisis. Second is his assessment of the policy response.

**The Role of the Lehman Brothers Bankruptcy
in the Financial Meltdown**

Taka emphasizes the Lehman Brothers bankruptcy on September 15, 2008, as the key event that tipped the financial system into a deep crisis when it completely seized up, with devastating effects on the economy. His is the common view, but I think it leaves out two other key elements that are extremely important to understanding the resulting severity of the financial crisis: the AIG collapse and the initial reaction of the U.S. government to obtaining bailout funds to deal with the crisis.

The first element is the AIG collapse on September 16, which was indeed triggered by the Lehman bankruptcy. The collapse of AIG revealed that the rot in the financial system was far deeper than the problems created by delinquencies in the subprime mortgage market. Up until the AIG collapse, the view in the markets was that the problems in the financial system were primarily due to lax lending standards in the subprime mortgage market that were leading to large losses on securities that were backed by subprime mortgages as these mortgages defaulted. Because the subprime market was only a small percentage of total capital markets, it looked like the problems in the subprime market, although serious, could be contained.

After the Bear Stearns bailout, it was common knowledge that Lehman was very exposed to losses on subprime mortgage securities and that there was a distinct possibility that Lehman might go bankrupt. As a result, the market

was more prepared for a possible Lehman bankruptcy. AIG was, in contrast, a much bigger surprise to the market. It was not until September of 2008 that there was any inkling that AIG had made such big bets in the credit default swap (CDS) market. When Lehman failed and AIG required a massive rescue by both the Federal Reserve and the U.S. Treasury, it became clear that huge carry trades were the norm, not the exception, in the financial system. That is, financial firms were booking huge profits (in AIG's case premiums on the CDSs) as long as financial markets remained healthy, but if tail risks materialized, the losses would be astronomical. The collapse of AIG therefore revealed how risky the financial system had become and that any further systemic shocks to the financial system could result in a complete breakdown.

The initial attempt to obtain government bailout funds to deal with the crisis was another element of the crisis that deserves more attention. When thinking about the costs of a financial crisis, it is important to recognize that the loss of confidence is a key driving force of financial panics. In the wake of Lehman and AIG, when the Treasury first went to Congress to ask for \$700 billion for the Troubled Asset Relief Program (TARP), it presented them with an extraordinary three-page proposal with many elements that were clearly unacceptable. Not only was it ridiculously brief, suggesting that the Treasury was insufficiently prepared to cope with the increased virulence of the financial crisis, but it had provisions that the Treasury's disbursement of funds would not be subject to any Congressional oversight, nor could the Treasury's actions be subject to court review and lawsuits. This proposal was rightfully considered to be inconsistent with democratic principles, and it severely eroded confidence in the Treasury's ability to cope with the crisis. Then when the TARP bill came up for a vote in Congress, it was voted down on September 29 and, most shockingly, it was President Bush's own party, the Republicans, that opposed the Administration's TARP bill. This vote indicated the weakness of the lame-duck Administration's ability to deal with the crisis. Then when the bill was passed, four days later on October 3, it was laden with special interest "Christmas presents," with one of the most outrageous examples being an excise tax exemption for producers and exporters of certain wooden arrows for children.

To say the least, all these shenanigans did not inspire confidence in the U.S. government's ability to cope with the crisis. The lack of confidence and outright fear in the financial markets was then manifest in the week following the passage of the TARP bill with the week beginning on October 6 showing the worst weekly decline in U.S. history. Credit spreads went through the roof over the next three weeks, with the Treasury bill to Eurodollar (TED) spread going to over 500 basis points, the highest value in its history to that time. Because fear

is what drives financial crises, the collapse of AIG and the U.S. government response to the crisis in late September and early October should be seen as events that are every bit as important as the Lehman Brothers collapse.

Why is adding these elements to the story important? Because it bears on whether it was a mistake for the U.S. government to let Lehman slide into bankruptcy. Although I agree with Taka that, in hindsight, letting Lehman go into bankruptcy was a serious mistake because the aftermath was a full-scale financial crisis. However, *ex ante*, it is not as clear. It is not obvious that a Lehman bankruptcy would have had such disastrous effects on the financial system if AIG had not engaged in its risky activities in the CDS market or if the U.S. government had shown that it was up to the task of containing the crisis. In that case, letting Lehman go bankrupt may have made sense because the alternative of a Lehman bailout would increase future moral hazard risk-taking in the financial markets.

The situation did not get better later in the fall of 2008 and the spring of 2009. The way the Treasury administered the TARP funds was, to put it mildly, highly problematic. The Treasury rightfully concluded quickly that buying troubled assets would not contain the crisis and so moved to using the TARP funds to inject capital into the banking system. However, the disbursement of these funds was grossly mismanaged. Because Treasury Secretary Paulson insisted that healthy as well as unhealthy banks should be encouraged (sometimes coerced) to take TARP funds, the funds were disbursed with very few restrictions on their use. This led to recipients of TARP funds paying out a substantial percentage to the stakeholders in the recipient firms. Something on the order of half of the funds was paid out in dividends to shareholders, while employees continued to receive large bonuses. Particularly egregious is that financial firms with huge debt overhangs were allowed to reduce their capital base by paying out dividends. This is, of course, exactly what the management should do if it is acting in the interest of the shareholders, and indeed this is what we teach our MBA students is part of managers' fiduciary responsibility to maximize shareholder value. However, these payouts were clearly not in the public interest because the whole point of the TARP funds was to beef up banks' capital so that they would be less likely to go under and so they would continue to make loans. Having half the money go out the door to shareholders and not into higher capital was a misuse of these funds and indicated that the government response to the crisis was misguided.

The other problem with the administration of the TARP funds was that it poisoned the well for the allocation of additional funds to get the financial system on a sounder footing, or to prevent an even worse crisis if more Lehman

Brothers and AIGs came out of the closet. The public was hopping mad about how the TARP funds were used to bail out “Wall Street” and provide payments to shareholders and bonuses to fat-cat bankers. Not surprisingly, when the new Obama Administration came in, it became abundantly clear that the Administration was not going to ask for additional funds to shore up the financial system, nor would it have been able to get those funds if needed.

By March of 2009, the situation got downright terrifying and the credit spreads hit their peaks. The fear was not unjustified. If another Lehman Brothers had occurred at that time, the financial system would have imploded further and it is likely that a depression would have ensued. Luckily this did not happen, and the stress tests proposed by the U.S. Treasury revealed that the banks were not in as bad shape as some thought, and so the financial system began to recover.

A conclusion that I draw from this episode is that the lack of the U.S. government’s ability to cope effectively with the crisis was a key reason why the crisis ended up being so severe. I would also add—although I am biased because I was a Federal Reserve insider who actively supported aggressive action by the Fed to contain the crisis—that the brave actions by Chairman Bernanke helped save the day and prevented a much more dire outcome. As Paul Volcker put it, the Federal Reserve went to the “very edge of its legal authority” to contain the crisis. I never viewed this as a criticism of the Fed because Volcker was just stating a fact. I believe that the Fed’s actions were successful in promoting the recovery in the financial system that we see today. This does not mean that they are not controversial. There will be serious consequences from these actions because they will increase moral hazard incentives to take on additional risk in the future unless these perverse incentives are restricted by appropriate regulation and supervision of the financial system. In addition, these actions have spurred criticisms of the Fed that are leading to the most serious attacks on the Federal Reserve’s independence in its history. Nonetheless, these actions helped avert a depression, and given the tradeoffs, I strongly believe that the Fed did the right thing.

Assessment of the Policy Response

I agree with Taka on his characterization of the difference between quantitative easing (QE) and credit easing (CE). Quantitative easing, which is what the Bank of Japan pursued in the late 1990s and early 2000s, involves an expansion of the liabilities side of bank balance sheets. Credit easing, on the other hand, which is what the Federal Reserve has been engaging in during this crisis, involves expanding the asset side of bank balance sheets.

I would put a slightly different slant on this distinction. Quantitative easing is a monetary action to expand bank balance sheets that has traditional expansionary effects by increasing money supply growth and raising expectations of future money supply growth along the lines that Auerbach and Obstfeld (2005) have articulated. In contrast, credit easing is focused on repairing credit markets so they can function normally again. Credit easing does involve an expansion of liquidity, but in contrast to quantitative easing, it is not focused on expanding the money supply, but rather on lowering credit spreads and making credit more readily available to jump-start the economy.

I also agree with Taka that the measures taken by the Federal Reserve were necessary and have helped stabilize financial markets and the economy. On the other hand, I think that Taka needs to address critics of the Federal Reserve actions, such as John Taylor (2009) to bolster his case.

Taka also discusses the role of inflation targeting in dealing with a financial crisis. He discusses the Bank of England's difficulties in meeting its inflation target. In the November 2008 and February 2009 *Inflation Reports*, the Bank of England indicated that it would not achieve its 2 percent inflation target even over the coming three years. Taka then asks whether the Bank of England was abandoning inflation targeting or was incompetent at achieving its target?

I believe that the answers to the two questions are no. The shock from the financial crisis was so large and unforeseen that missing the inflation target would have been the result even if monetary policy had been optimal on an ex ante basis. However, Taka's questions raise several issues about the conduct of inflation targeting when an economy is hit by a massive financial shock of the type we have recently experienced.

Some critics of inflation targeting have argued that this recent episode casts doubts on the effectiveness of inflation targeting as a monetary policy strategy. I strongly disagree. The lesson that should be learned from the recent crisis is that inflation targeting needs to be very flexible. A criticism of the conduct of some inflation targeting regimes that I brought up in the past (Mishkin 2005) is that some regimes, particularly the Bank of England, have given the impression that they were always trying to hit an inflation target at a set horizon, two years in the case of the Bank of England. However, optimal monetary policy would never set a fixed horizon for achieving an inflation target because, as Svensson (1997) has shown, when there is a concern about output fluctuations, as there should be, and the inflation rate is shocked sufficiently away from its long-run target, the path for the medium-term inflation target horizon needs to be modified. The recent financial crisis was exactly such a shock and it was sufficiently large that the horizon for hitting the inflation target would need to be

lengthened substantially. In my discussion of the possibility that the horizon would have to be modified in Mishkin (2005), I discussed the case of an inflation overshoot as occurred in Brazil in 2002 and 2003 and how the Brazilian central bank handled this well by lengthening the horizon for its inflation target. This argument is just as valid for an undershoot of the inflation target that comes from a contractionary shock like the one we have experienced recently. The possibility of negative shocks to the financial system support increased flexibility for inflation targeting regimes.

But can inflation targeting help a central bank deal with a financial crisis? The answer is yes. Financial crises are contractionary and so actions to stabilize inflation are also ones that help stabilize economic activity. Furthermore the expectation that action will be taken to keep inflation from falling during a financial crisis makes monetary policy more effective in coping with the crisis. By preventing inflation expectations from falling, inflation targeting helps keep real interest rates from rising, which helps stabilize both financial markets and economic activity.

In addition, as I have argued in Mishkin (2008), preemptive actions when a financial disruption occurs are crucial to preventing more serious negative outcomes as a result of financial shocks. However, these preemptive actions would be counterproductive if they caused an increase in inflation expectations and the underlying rate of inflation; in other words, the flexibility to act preemptively against a financial disruption presumes that inflation expectations are well anchored and unlikely to rise during a period of temporary monetary easing. Inflation targeting can be extremely helpful in anchoring inflation expectations and therefore can be very helpful in enabling the central bank to effectively deal with a financial crisis.

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GENERAL DISCUSSION
Fire, Flood, and Lifeboats:
Policy Responses to the Global Crisis of 2007–09

Chair: Kevin M. Warsh

Mr. Warsh: We talked a lot about the centrality of Lehman Brothers to the financial panic and ensuing weakness in the economy. I think Rick had a broader view, that it was more than Lehman, and talked about the role of other entities like AIG. I wonder if each of you could speak to the centrality of the failures of Fannie Mae and Freddie Mac, which preceded Lehman Brothers and give us your own sense as to how important that weakness was. Parenthetically, there was about \$5 trillion of outstanding Fannie and Freddie debt, and the government tried to assure holders that those holdings were in effect backed by the government.

Mr. Hale: Taka, I just want to make a suggestion to you that in interpreting the Lehman failure, it is important to look at the politics of the U.S. Congress on the issue of rescuing banks. The equity capital of the U.S. banking industry 18 months ago was \$1.3 trillion. As we discussed yesterday, the total write-offs over the last year and a half amounted to \$1.1 trillion, almost 90 percent of bank capital. In the first half of 2008, banks did raise \$400 billion with equity sales. This includes banks that failed; Wachovia, City National, Lehman, Fannie Mae, and Washington Mutual together raised \$50 billion dollars just in May and June of 2008. But the capital raised was too little to compensate for the losses that occurred. If we hadn't had the Lehman failure and the panic that followed, it's unlikely Congress would have approved the Troubled Asset Relief Program (TARP). The fact is we had to have Lehman fail in order to get Congress to approve the TARP money. In the absence of Lehman's failure, the problem might have taken a different form and taken longer but could have been even more serious and more shocking.

Mr. Frenkel: Several quick comments. First, I think it is fair to say, and only people in the Fed can confirm this, that there was insufficient knowledge about the degree of interconnectedness of markets and about the damage that would

occur. If there wasn't that lack of knowledge, I suggest the crisis probably would have been much less severe.

I also want to address the question of the role of government, which I think is a very central issue as we look forward. The fact that congressional anger potentially may constrain monetary policy is a serious danger. The anger of Congress should not be ignored, but the independence of the Fed should make it invulnerable to that anger. And one way to go about it is to make sure that there is a very sharp distinction between the fiscal policies that have to do with public money and the Federal Reserve, which really should not engage in things that have consequences for taxpayers.

One last remark, which has to do with governance. At the present time, the government and the Fed find themselves owning private companies. Very little has been discussed, in the public at least, about how the conduct of corporate board meetings and the like is being implemented. I can tell you it's a very challenging matter when the owners, the lawyers, and creditors meet, even in normal times. Here the Israeli experience of the 1980s is insightful. We had a bank-share crisis in Israel and the government, in a sense, found itself owning the entire banking system. Since then it has been reprivatized, but on the day the government took over the banks, a law was passed that forbade the government from intervening, having a board member, or interfering in any way with management of the banks. Thus there was a sharp distinction between ownership and management. This is a very key point that we need to worry about now because the government will not exit from corporate ownership very quickly.

Mr. Warsh: Let's gather two more questions and then give Rick and Taka a chance to respond.

Mr. Feldman: I have a two-part question. First, could the panelists comment on the Balkanized regulatory structure in the United States and what should be done about it? One of the things Japan got very right was unifying the regulatory structure under a single entity. It would be nice if perhaps Sato-san could also comment on this issue. Second, following up on the issue of congressional behavior, what sort of redesign of the incentive structure for Congress would be beneficial in bringing about the things that Jacob just mentioned? This is something that Japan also did right, though it is not well understood. In the early or mid-1990s there was a restructuring of the district voting system that actually did have, in my view, quite a strong impact on bringing more accountability for both fiscal and other structural reform. So, what kind of incentive structure changes are necessary in the legislative process, and are there any other lessons from Asia to help us redesign it here in the United States?

Mr. Obstfeld: I think Taka is absolutely right about the need for a resolution structure and that it would have helped in the crisis. One would hope that the existence of such a credible structure with the right features would act as a deterrent to bad behavior by financial institutions, though it's doubtful that it would be enough. And so, one wonders going forward about instituting other means of persuasion that might avoid getting to the point where a resolution process is needed because once you get to that point damage has already been done. In that connection, I think the Lehman experience after Bear Stearns is quite instructive. Everybody knew Lehman was weak, and apparently the Fed communicated to Lehman the need to raise more capital, but Lehman failed to do so. One tool the Fed had available was its lending facilities and, apparently, in an example of the law of unintended consequences, Lehman was able to get around that by drawing on dollar facilities that the Fed had extended to Europe for some of its liquidity needs. And so, unintentionally the Fed set up a way for Lehman to actually continue its bad behavior, which led to the crisis. So, this comes back to Rob Feldman's point about the fragmented nature of information in the U.S. regulatory structure. This is why AIG came as such a shock, and it was also apparent in the way that lender of last resort facilities were put together in a sort of ad hoc way during the crisis. These facilities solved some problems but led to others.

Mr. Warsh: Taka, perhaps you go first, and then Rick.

Mr. Ito: Regarding Fannie and Freddie, it was known and recognized that their debts had implicit guarantees, as was evident in interest rate spreads. Much of the debt was bought by foreign governments, held as foreign reserves, and even as late as March 2008, Congress told Fannie and Freddie to lower capital so that they could lend more. This is more than forbearance. Congress is telling them to lend, which means that they have a guarantee from Congress. So I think it was just natural that those implicit guarantees were turned into explicit guarantees. And it was a good thing, because if Fannie and Freddie were allowed to fail, most likely the dollar would have crashed because the Asian countries and Middle East countries held a lot of agency debt. It was not in the headlines, but there were a lot of negotiations between these countries and the U.S. Treasury concerning those agency bonds. So, the crash of the dollar was avoided because Fannie and Freddie were saved.

David Hale implied that Lehman's failure was necessary to get a new tool, TARP money, to fight the bigger fire. Japan, intentionally or unintentionally, did the same thing; they allowed the Hokkaido Takushoku Bank to fail in 1997. In a sense, that shock made it possible to acquire more funds to rescue the rest

of the banking system. I originally thought that it was a good thing to have allowed Hokkaido Takushoku Bank to fail, but I have revised my view. I think the government and the central bank have to avoid ex ante what they think will generate only a minicrisis. You need to communicate and persuade the public of the necessity of injecting a lot of money to save the system, to maintain systemic stability.

I think I will defer Jacob's question to Rick. Robbie Feldman mentioned the regulatory framework and that Japan got it right in 1998 when they removed the defunct supervisory function from the Ministry of Finance and created an independent supervisory agency, the integrated Financial Services Agency (FSA). It has worked, I think, over the years. In this crisis, the Japanese financial system has coped much better with the crisis than it did before, probably thanks to the FSA. Mr. Sato may tell us more about it later today.

I think that Maury's question is also in line with my thinking, and I think it's very important to think about the resolution mechanism. I think that Barry (Eichengreen) will have a much more concrete proposal in the next session.

Mr. Mishkin: Let me first deal with Kevin's issue about Fannie and Freddie. Fannie and Freddie was clearly an accident waiting to happen, as was well known among economists. I don't know how many editions of my textbook mentioned this. It had a box saying, "It's going to blow up, it's going to cost the taxpayer a lot of money." It wasn't that I was especially savvy; every other textbook in my field would say something like this. So this was not a surprise. Of course, it got even worse when Congress in the early 1990s allowed Fannie and Freddie to expand their portfolios. As an aside, the *Wall Street Journal* view that this crisis was caused by Fannie and Freddie is, to me, just off-base. It was not the driving force behind the crisis. It has cost the taxpayers a lot of money and it is a big deal. But this episode is a classic financial crisis where you have financial innovation, unfortunately at a bad time. You had a financial innovation where they didn't get the business model right, and this has happened over and over again throughout financial history. Also unfortunately it occurred at a bad time because there was all this liquidity sloshing around. This is what Maury talked about—all these global imbalances actually helped add fuel to the fire—although I don't think it was the primary cause. It was something that just made this much worse. That's really what caused this crisis, and thinking that it's all because of Fannie and Freddie is just not correct.

Jacob talked about the issue of knowledge of interconnectedness. I think he is absolutely right. In fact, that was the point I was making about AIG, that there was not a full understanding of exactly how serious this problem was going

to be, and how deep the rot was in the financial system. And that's the nature of doing supervision. You don't always have enough information. You're not prescient. You don't have a crystal ball. The other thing that Jacob pointed out, which I think is absolutely right, but I think we need to be a little careful about, is that it is very dangerous for central banks to be involved in fiscal actions because it very much compromises their independence. However, in the midst of a crisis there is a blur between what's a fiscal action and what's monetary policy action. And so, I have been very supportive of what the Fed has been doing, both when I was inside the Fed and afterwards, in terms of some of the extraordinary actions the Fed has taken. But what worries me is that the Fed has to get out of this kind of activity in the long run, and I have not yet heard discussion of how that would be achieved. I'm particularly concerned about mortgage-backed securities; to have the Fed permanently involved in housing finance, which is thoroughly politicized, is very dangerous. So, this is a big challenge in terms of the exit strategy for the Federal Reserve. It was appropriate to get into the markets to deal with this crisis, but you don't want to stay in on a permanent basis. That's one of the most important challenges.

Regarding the regulatory structure, I've actually stated my views very strongly that there needs to be a single systemic regulator. Doing it by committee is not a great idea. Anybody who has worked in Washington, other capitols, or even the IMF knows that there's always bureaucratic infighting, and you have to have somebody in charge. That doesn't mean that a committee of regulators wouldn't be helpful to provide some oversight: somebody's got to be there to do the job. But as I've expressed in op-eds, the central bank is the institution best suited to be in charge.

And finally, on the issue of resolution authority, I couldn't agree with Maury and Taka more on this. It is an absolute crime that we are sitting now, a year after Lehman, and we don't have a resolution authority in place. It is staggering to me. It is an indication of the problems we have with Congress, because the Administration has proposed this. And what, to me, is remarkable about this is that a lot of Congress is saying, we hate the bankers. They've been bad. They're getting paid too much money and so forth. Having a resolution authority is the key thing that you need in order to get good behavior. Think about what went on here. After Lehman Brothers went under, if the government says to a systemically important institution that it should do something to get more capital, the institution could say, you know what, you've got a choice: You can send me into bankruptcy and get another Lehman Brothers. Think about what that's going to be like. Or you give me the money, or let me do whatever crazy things I want to do. So, it's not just an issue of being more efficient when the crisis occurs and

when the institution goes under. It's actually critical in terms of having the stick to enforce good behavior. That's an extremely important point, and I think it's implicit in what Taka said.

Mr. Warsh: Thanks Rick. Taka is going to make a quick final remark.

Mr. Ito: Just a side remark about Fannie and Freddie who provided implicit guarantees for their debt. Ten years ago, in the midst of the Asian crisis, the Thais, Indonesians, Koreans, and Japanese were told that implicit guarantees were the worst form of financial regulation. We were told this 10 years ago by Americans. So why did the U.S. provide these guarantees in its system?

Mr. Mishkin: Well, one response is that economists said this is outrageous. We weren't listened to. That's democracy.

PANEL DISCUSSION

EXPERIENCES WITH THE CRISIS

The Global Financial Crisis: Impact on Asia and Policy Challenges Ahead

Heng Swee Keat

The global financial crisis had hit Asian economies with unexpected speed and force. Equally, the recent recovery in Asia was faster and stronger than expected. The crisis throws up important features of the economic linkages between Asia and the world, and within Asia. This paper will touch on three issues: first, why the impact on Asia was so deep, and the rebound so swift; second, Asia's immediate challenges in managing the recovery; and third, the longer-term structural challenges.

Impact of Global Financial Crisis on Asia

The unexpected speed and force of the global financial crisis affected Asian economies through both the trade and financial channels, reflecting the region's deep economic integration with the rest of the world. This effectively put to rest earlier notions that Asia had become "decoupled" from developments in the U.S. From peak to trough, Asian exports tumbled by over 30 percent, average sovereign credit default swap (CDS) spreads increased more than threefold for five Asian economies, and emerging Asia stock prices fell by more than 60 percent.¹ Exchange rates also came under pressure in a number of countries in the region. Asian economies, excluding China and Japan, contracted by an average of about 6.2 percent from peak to trough in the current downturn.² This is not far from the 8.3 percent gross domestic product (GDP) contraction during the Asian financial crisis, although Asia was not at the center of the present crisis.³

Explaining the Collapse in Asian Exports

The recent and unprecedented collapse in exports in Asia has three notable features. First, the fall in exports across Asia, from Japan to Indonesia beginning from July 2008 to the trough around February 2009, was highly synchronized.

Author's note: *I would like to thank Edward Robinson and members of the Economic Policy Department of the Monetary Authority of Singapore for their assistance in the preparation of this paper.*

Second, the export contraction was swift and sharp—exports tumbled by about 35 percent from peak to trough (July 2008 to February 2009). This was far sharper than the 18 percent drop during the 2001 information technology (IT) downturn, as well as the 16 percent fall during the Asian financial crisis, when Asia was at the epicenter of the crisis. Third, intra-Asian exports contracted by even more than shipments to the advanced economies. Intra-Asian exports fell by 48 percent peak to trough, against a 29 percent decline in exports to the U.S. and 15 nations of the European Union (EU-15) over the same period.

These features suggest the presence of a common external demand shock, rather than country-specific factors, at play. Indeed, our empirical work shows that business cycles in the key economies in Asia have been increasingly driven by common rather than idiosyncratic shocks. Based on a data set of 10 Asian economies excluding Japan, we find that most countries in the sample experienced a decline in the variability of the idiosyncratic component relative to that of the common component in the post-crisis period (2000–2008) compared to the period up to the Asian crisis (1980–1999).⁴ Further, a separate econometric study by the Monetary Authority of Singapore (MAS) shows that the income effect, as proxied by (the decline in) Organisation for Economic Co-operation and Development (OECD) GDP, largely explained the bulk of the recent collapse in Asian exports. Our estimates suggest that about 85 percent of the fall in Asian exports on average over 2008:Q4 to 2009:Q1 may be attributable to the decline in OECD GDP.⁵

The common shock was propagated across Asia with a full force, and indeed, magnified, because of the structure of economic linkages and the recent shifts in behavior pertaining to firms' inventory management.

Structurally, the proliferation of cross-border production networks in the region has increased its susceptibility to common shocks. Intra-Asian trade is dominated by trade in intermediate goods. In particular, electronics accounts for about 70 percent of intra-Asian trade in parts and components within machinery and transport equipment, compared to slightly over 30 percent in North American Free Trade Agreement (NAFTA) countries and Europe.⁶ Exports of machinery and transport equipment account for about half of total exports in Asia. As trade in intermediate goods cross national borders multiple times, a fall in end demand in the G-3 can have a magnified impact on the region's trade flows. This helps to explain the relatively steeper decline in intra-Asian exports in the recent downturn.

In addition, global IT firms seem to have made significant changes in their inventory management. At the depths of the crisis, in the second half of 2008, they made deep cuts in output that exceeded the contraction in end demand,

and drew down inventories sharply. The inventory adjustments appear to be uneven across the supply chain—global component manufacturers who are furthest upstream in the IT production chain experienced the sharpest cutbacks in production and inventory drawdowns.⁷ When the fall in final demand was not as dire as expected, the upstream segment also rebounded more sharply as the restocking needs were higher. This partly explains the sharp rebound in the exports of some Asian countries.

The behavioral change probably reflects the lessons learned following the 2001 IT downturn. As an aside, the tighter inventory management in the IT sector, and the way different segments of the value chain adjusted, make the interpretation of high frequency data and the policy responses for the short term more difficult. It may thus be useful to study how inventory management differs across sectors.

Some Resilience to External Shocks

Although exports had been uniformly compressed across Asia, the final impact on GDP varied greatly, depending on a number of factors such as the size of the economy, the degree of trade openness, and the capacity for countercyclical policies. The larger Asian economies of China, India, and Indonesia have avoided a recession, due in large part to the resilience of their sizeable domestic demand. In comparison, the smaller, more open economies in the Association of South-east Asian Nations (ASEAN) and the newly industrialized economies (NIEs) were more badly hit, with many suffering their worst output contractions in the postwar period.

While Asian output and exports were hit hard, their monetary and financial systems were largely resilient. The financial shocks from the advanced economies were felt in Asia through a variety of channels, including the drying up of trade credit and cross-border capital flows, the pullback by global banks, heightened risk aversion, and a sharp fall in asset values. But apart from the initial stresses that affected all markets, there were no severe financial dislocations—interest rates and exchange rates have remained stable in most countries.

Asia withstood the financial shocks well because there were few inherent sources of vulnerabilities. For example, credit excesses and currency mismatches that had prevailed during the Asian crisis, and which now plague a number of Central and Eastern European economies, were largely absent. Households and corporations entered this crisis with generally stronger balance sheets, which helped to bolster confidence. This favorable outcome reflects the host of reform measures in the economic and financial systems following the Asian financial crisis—dependence on foreign borrowing was cut back, official

reserves rebuilt, prudential supervision of the financial sector tightened, banks recapitalized, nonperforming loans lowered, and corporate leverage reduced.⁸

Stronger Than Expected Rebound in Asia

While the economic contraction was sharp, the recent recovery has been stronger than in the past. One quarter after the trough in the present cycle, Asia's GDP rebounded by 9.4 percent on a quarter-on-quarter seasonally adjusted annualized basis (in 2009:Q2), significantly stronger than the 4.3 percent rise after the Asian crisis (in 1998:Q4). The improvement was across the board in all expenditure categories, with particular resilience in private consumption and investment spending. Household spending has held up better this time round as the rise in unemployment has been more moderate. Asian exports have also recovered, lifted in part by a sharp increase in shipments to China—Asia's exports to China (up 37 percent since touching a trough in January 2009) have grown more rapidly than China's own exports (up 12 percent since its trough in February).⁹ Inventory restocking—particularly among upstream producers who had drawn down their inventories to very low levels—appears to be driving the recent upturn in the global IT market, setting the stage for the bounce in 2009:Q2.¹⁰

A major factor supporting the present recovery has been the timely roll-out of appropriate fiscal and monetary stimulus measures. Governments rolled out a massive US\$700 billion worth of stimulus measures in Asia over the past year,¹¹ in stark contrast to the contractionary fiscal policies during the Asian crisis. Monetary policy responses were swift, with many Asian central banks cutting interest rates in rapid succession. Again, this was unlike 1997–98, when they were forced to sharply raise interest rates to support their currencies and reduce capital flight. The decisive macroeconomic measures have helped to restore confidence, support domestic demand, and avert massive layoffs in the labor market. A better appreciation of the needed policy responses and increased room for policy maneuvers, as well as a global recognition of the scale of the problem, has led to a more timely and appropriate policy reaction this time around.

Managing the Recovery: The Challenges

With the worst of the crisis behind us, the policy focus in Asia is now geared towards managing the cyclical recovery. In the short term, there is a need to ensure that the macroeconomic policy settings remain appropriate to ensure sustainability of the economic recovery, i.e., the stimulus measures should not be removed prematurely. Although economic conditions have picked up more recently, a sustained global recovery is not a given.

While the easy liquidity conditions in Asia ought to be maintained, policy-makers will need to remain vigilant to domestic credit expansion, as well as to the potentially destabilizing surges in capital flows in search of higher-yielding assets and the attendant risk of asset price inflation. In effect, the execution of an “exit strategy” in Asia in the context of rising capital flows could pose some challenges in the short term. Fluctuations in global commodity prices could also introduce volatility to consumer price index (CPI) inflation, given the greater weight attached to basic necessities in the consumption baskets of emerging economies.

Asian central banks will need to remain focused on anchoring inflationary expectations and ensuring medium-term price stability. We need to adopt a pragmatic approach in response to these developments. For example, excessive capital inflows at times may need to be met with appropriate sterilized interventions. Monetary policy is a blunt tool to tackle asset price inflation pressures, but a combination of prudential and administrative measures to prevent excess liquidity from fueling asset price bubbles could be employed in a complementary way. The most appropriate response will, of course, vary across countries.

Considerations beyond the Crisis: Structural Changes Needed

Over the next several years, Asia would likely have to accept a lower rate of growth. The external demand that has provided a key impetus for growth may be subdued, as advanced economies would likely grow at a rate below potential, held back by significant balance sheet weaknesses. Asia has to rely more on domestic demand, but in the short term, few economies can do so meaningfully without placing stresses on macroeconomic and financial stability. Most Asian economies are not yet at a stage where domestic demand can take over as the primary source of growth. The experiences of Japan and Germany suggest that reducing a nation’s export dependence involves major structural changes which evolve over an extended period of time.

While the world clearly benefited from the “productivity dividend” arising from the entry of China and other large emerging market economies into the global economy, their further integration into the global economy in the years ahead will also pose significant challenges. This “supply shock” will induce changes in the patterns of trade, investment, and production. The new competitive dynamics mean that structural adjustments by all parties are necessary. But these adjustments will be difficult against a backdrop of differences in demographics, saving and consumption habits, and exchange rate regimes and institutional arrangements, among others.

Continuing Structural Reform in Asia

The global financial crisis is an important reminder to all countries that structural reforms in the real economy are inevitable. Many economies in Asia did well in pursuing institutional, banking, and corporate sector reforms following the Asian crisis. In the aftermath of the global financial crisis, Asia needs to continue with structural reforms. Four areas merit attention.

First, Asian nations must enhance investment rules and investors' protection to promote investment in physical capital, including infrastructure. Infrastructure remains underdeveloped in many Asian economies, presenting significant bottlenecks to growth. The Asian Development Bank, for instance, recently estimated that Asia needs to spend about US\$8 trillion on transport, power, and communications infrastructure over the next 10 years if it is to emerge as an integrated and competitive region. To attract long-term investments in these areas, a combination of public and private funds is necessary. Further, the decline in investment in some parts of Asia has been severe compared to that in other regions over the past one to two decades and relative to Asia's economic fundamentals and export growth.¹² Especially since the Asian crisis, the growth of gross capital formation in Asia, excluding China and India, has slowed to some 4.7 percent per annum (1999–2008), less than half the growth rate of 10.5 percent per annum pre-crisis (1990–96). Accordingly, the investment-to-GDP ratio in many Asian economies had fallen sharply and has remained at a subdued level. Hence, accelerating corporate and public capital spending in the region, especially outside of China, will be necessary for Asia to sustain its growth and to help redress some of the imbalances in the global economy.

Second, enhance the quality of human capital and education standards in Asia. In particular, there is significant potential for catch-up in the area of higher education and training.¹³ Continued investment in human capital would enhance labor productivity and long-term growth. This is urgent both for countries that are facing an aging population and those seeking to harness the dividend of a youthful population.

Third, enhance regional trade and financial integration.¹⁴ As mentioned earlier, intra-Asian exports are dominated by intermediate inputs for producing final goods that are sold largely to the rest of the world. As per capita purchasing power rises, Asian consumers will generate more demand for intra-Asian goods and services.¹⁵ Asia needs to raise the proportion of final goods in intraregional trade, as well as to exploit further opportunities in services trade. The reorientation of the cross-border production network towards serving the needs of the region will provide a more balanced and sustainable growth path for Asia.

There is also a need to accelerate the pace of financial deepening and integration within Asia. A well-functioning domestic financial system that efficiently allocates capital to productive uses is necessary for sustainable economic growth. In addition, efficient cross-border flows, especially within the region, will allow Asian countries at different stages of development to realize their growth potential. Developing a deep and integrated financial system in the region is a key building block in supporting structural adjustments in the region.

Fourth, greater currency flexibility is also important to facilitate longer-term structural adjustments and to correct global imbalances. However, we need to be circumspect about the role that currency flexibility can play in correcting such imbalances. As Paul Volcker observed many years ago, increased currency flexibility “cannot be a substitute for more fundamental policies to restore competitiveness, to enhance productivity and savings, and to maintain stability.”¹⁶ Currency flexibility needs to be part and parcel of a comprehensive package of structural reform for all countries involved. The sequencing has to take into account institutional and structural capacities. As these are strengthened, the necessary adjustments in the real exchange rate can then be accommodated. The secular rise in the real exchange rate, at an appropriate pace over the medium term, needs to reflect the underlying productivity and income growth in the economies concerned.

These changes will not take place overnight. Current account imbalances have appeared with some regularity in the world economy, irrespective of exchange rate arrangements. Such imbalances reflect underlying saving and investment decisions of private agents, which in turn hinge on slow-moving drivers such as demographics, sociocultural inclinations, and the state of domestic financial and welfare systems. These have to be factored into the consideration on the speed and sequencing of policy actions. Nevertheless, difficult though these changes may be, it is important that we pursue them.

Sum-Up

To sum up, Asia has an important role to play in the post-crisis world, and it is useful for the region to stay engaged in such global discussions. While there are considerable challenges and stresses in the near term, we must resist the temptation for quick fixes that do not address the underlying concerns. I believe Asia must continue to focus on strengthening its economic fundamentals—only then can it contribute meaningfully towards a more robust and resilient global economy.

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NOTES

1 The (unweighted) average sovereign CDS spreads for five Asian economies (Korea, Indonesia, Malaysia, the Philippines, and Thailand) rose from 163 basis points in June 2008 to a high of 770 basis points in late October 2008. The MSCI Emerging Asia Index fell from 513.8 at the start of January 2008 to a low of 187.7 in late October 2008.

2 Asian economies refer to the economies of the NIE-3 (newly industrialized economies of Hong Kong, South Korea, and Taiwan) and the ASEAN-5 (Association of Southeast Asian Nations including Indonesia, Malaysia, the Philippines, Singapore, and Thailand).

3 The extent of the adjustment in the level of peak-to-trough GDP (2008:Q3 to 2009:Q1) varied quite a bit, nonetheless, for each of the countries concerned, ranging from 1.2 percent (Indonesia) to -10.1 percent (Taiwan), reflecting considerable fundamental differences among economies in the region.

4 The ratio of idiosyncratic relative to common fluctuations averaged 0.8 for the Asian countries over the period 2000–2008. This compares with a ratio of 1.2 in the pre-crisis period. Thus, the size (as measured by the standard deviation) of common fluctuations has become larger. The increased sensitivity to a common shock could reflect the proliferation of cross-border production networks in the region, such that an external shock is manifested as increased volatility of the output gap for each country (see Chew and Tan 2009).

5 We examine the impact of global demand on the real export performance of nine Asian economies (excluding Japan) using a fixed-effects panel data model over the period 1998:Q1 to 2009:Q1. We find that a 1 percentage point increase in OECD GDP growth produces an average increase of 5.5 percentage points in Asia's real goods exports on a quarter-on-quarter, seasonally adjusted basis. See Monetary Authority of Singapore 2009.

6 This underscores the high degree of specialization and interdependence among producers in East Asia in the electronics industry. These results are for the Asia-10 economies, namely Japan, China, the NIE-3 and the ASEAN-5. See Monetary Authority of Singapore 2009.

7 The drawdown of inventories at the major semiconductor foundries, for instance, was found to be significantly greater than the fall in global chip sales over the period 2008:Q2 to 2009:Q1.

8 The Asian corporate sector has deleveraged significantly since the Asian financial crisis, with the debt-to-equity ratio (market capitalization weighted average) falling from a peak of 400 percent in 1997 to about 75 percent in 2007. See IMF 2009. In the most affected economies, the ratio of nonperforming loans to total loans fell from the high teens at the peak of the crisis to relatively low single digits in 2007. See World Bank 2009.

9 Asian exports exclude China, Japan, and India. This suggests that the recent revival in Asia's shipments to China could have been driven more by the rise in domestic demand in China than by demand from China's export processing industries.

10 For instance, in Singapore, the output in the upstream components segment contracted more sharply than the downstream end-product segment between 2008:Q4 and 2009:Q1, and subsequently rebounded more strongly in 2009:Q2. This underlines the more pronounced production catch-up and inventory restocking effect that upstream firms experienced in 2009:Q2.

11 The bulk of the US\$700 billion of stimulus measures in Asia (excluding Japan) was accounted for by China (US\$586 billion announced in November 2008, or 12 percent of China's GDP). Other countries include Korea (US\$53 billion, or 6.8 percent of GDP), Malaysia (US\$18 billion, 10 percent of GDP), Singapore (US\$14 billion, 8 percent of GDP), and Indonesia (US\$6 billion, 1.3 percent of GDP).

12 See IMF 2006. The IMF suggests that the investment environment can be enhanced by lowering perceived macroeconomic risks through prudent monetary and fiscal policies, structural improvements including trade liberalization, deregulation, and improvements to infrastructure, as well as deepening and broadening financial systems.

13 Rankings on higher education and training vary greatly in Asia. While some of the more advanced Asian economies are above the 90th percentile, many others are clustered at the 50th to 60th percentiles, suggesting the scope for further improvements. See World Economic Forum 2009.

14 Intraregional trade in Asia (including Japan and China) stood at about 47 percent in 2008, well below the close to 60 percent share for the EU-15 countries.

15 See Goldman Sachs 2009. Across a sample of large emerging Asian economies (China, India, Korea, Indonesia, the Philippines, and Vietnam), the middle class currently constitutes only about 14 percent of the population. By 2050, the ratio is projected to rise to 76 percent. Goldman Sachs defines "middle class" as individuals whose annual incomes are between \$6,000 and \$30,000 in purchasing power parity terms.

16 See Volcker and Gyohten 1992.

Global Financial Crisis and the Korean Economy

Kyungsoo Kim

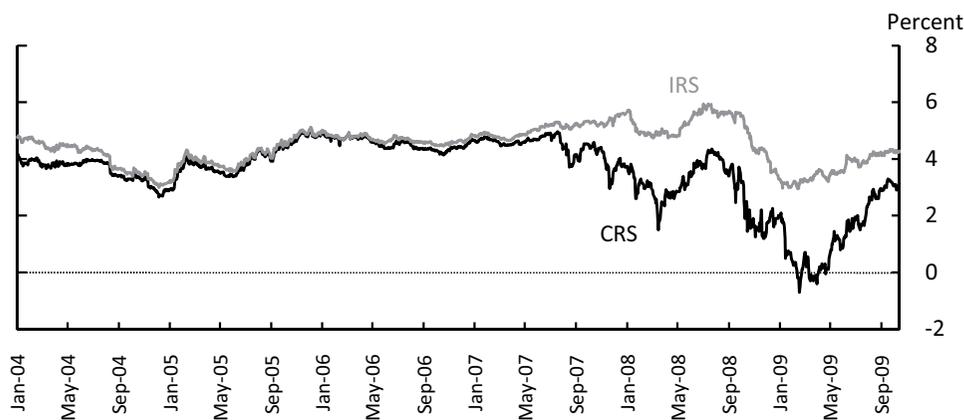
Korea has been one of the Asian nations most severely hit by the global financial crisis. At first glance, Korea appeared better placed to weather the shock thanks to its substantial cushion of official reserves, its improved policy framework, and its very limited exposure to toxic assets originating in Western banks. However, given the region's large trade volume and its financial integration with the rest of the world, investors' views on the Korean economy deteriorated as global deleveraging intensified and world growth slowed markedly. This affected the foreign exchange markets as foreigners began to repatriate their funds out of Korean financial markets. As of the end of November 2008, the Korean won had depreciated by over 25.4 percent in dollar terms since the collapse of Lehman Brothers in September, the largest fall among major Asian countries excluding Turkey. The stock price collapsed by 27.2 percent during the same period.

In fact, as Figure 1 shows, even before the collapse of Lehman Brothers Korean foreign exchange market conditions had already deteriorated. The figure shows daily three-year interest rate swaps (IRS) and currency rate swaps (CRS). Differences in market floating rates such as IRS and CRS rates potentially create profitable arbitrage opportunities if risks are limited to exchange rate risk.¹ However, they also reflect other risks, including counterparty credit risk, liquidity risk, and funding risk. These risks started to rise sharply in early August 2007 when BNP Paribas suspended its fund withdrawals, and in November 2007 and March 2008 when news related to the subprime mortgage problems surprised the market.

Due to the evaporation of global liquidity, foreign currency borrowing conditions for Korean banks severely deteriorated. The credit default swap (CDS) (five-year) premiums on Foreign Exchange Stabilization Fund (FESF) bonds showed marked upward trends (from 9.14, 135 basis points to 11.30, 368 basis points) and CRS rates fell relentlessly. In order to ease the foreign liquidity squeeze, the Bank of Korea (BOK) supplied a total of 26.6 billion dollars in

Author's note: *The views expressed here are those of the author, and do not necessarily reflect those of the Bank of Korea or the Bank of Korea's policy.*

FIGURE 1
Korean Foreign Exchange Market Conditions
 3-year interest rate swaps (IRS) and currency rate swaps (CRS)



foreign currency liquidity through its Competitive Auction Swap Facility using its official foreign reserves, and through its Competitive Auction Loan Facility using the proceeds of its currency swaps with the U.S. Federal Reserve. On October 19, the Korean government also guaranteed its banking sector's external debt until the end of June 2009.

To strengthen its defense against global illiquidity, the BOK established a US\$30 billion swap arrangement with the Federal Reserve on October 30, 2008. On December 12, the BOK entered into a 180 billion yuan/38 trillion won swap arrangement with the People's Bank of China (PBC), and at the same time agreed with the Bank of Japan (BOJ) on expanding the ceiling of existing won/yen swap arrangements from the equivalent of 3 billion U.S. dollars to 20 billion dollars. In spite of such efforts, deleveraging continued, and the CRS rate often fell into negative territory in February, March, and April 2009. Figure 1 clearly shows that the foreign exchange liquidity conditions have not fully recovered yet. Domestic credit spreads on corporate and bank bonds have also widened rapidly with the illiquidity in the domestic money market. This phenomenon, often termed "double drain," was unprecedented for Korea.

The Bank of Korea has responded with aggressive interest rate cuts to alleviate the credit crunch. It cut the "BOK base rate" on six occasions, by 3.25 percent overall. It also provided a total of 27.8 trillion won in market liquidity—by conducting open market operations, increasing the ceiling of its aggregate credit ceiling loan program, making banks a one-off payment of interest on

their required reserves, and contributing to the Bond Market Stabilization and Bank Recapitalization Funds. In addition, 12 securities companies were added to the list of eligible counterparties for RP operations, and bonds from banks and other institutions were added to the list of collateral eligible for open market operations.

In addition to the global crisis, the Korean economy suffered from the oil price hikes that occurred during the first half of 2008. From the second half of 2008, both the Korean export and domestic sectors began to feel the impact of the decline in international demand, and the fourth quarter annual GDP growth rate fell to -5.1 percent.² In January 2009, the International Monetary Fund (IMF) revised its forecast for Korean GDP growth from a positive 2 percent to a 4 percent contraction. This was among its largest downward revisions for emerging market economies.

The rise in external debt has been a main cause for concern among foreign investors, even though the most recent increase in debt, that acquired since 2006, has differed in structure from that in the period prior to the onset of the East Asian crisis. A major share of the increase in debt has been bridge financing by domestic banks. These banks engaged in forward contracts with exporters and asset management companies, and balanced their positions through borrowing. Furthermore, bad loan problems analogous to those that contributed to the Asian financial crisis did not exist.

The external debt of the banking sector drew particular attention.³ For the whole economy, the mismatch between the external assets and debts did not widen, but strong asymmetry existed in the private sector as foreign assets were concentrated in the monetary authority, and foreign debts were concentrated in the banking sector (Table 1). This left severe mismatches in the banking sector.

TABLE 1
External Debts and Assets
(period end, \$US billions)

	2005	2006	2007	2008:Q2	2008	2009:Q1
External Debt	187.9	260.1	382.2	419.8	381.3	369.3
(short-term)	(65.9)	(113.7)	(160.3)	(176.2)	(151.1)	(148.1)
Banks	83.4	136.5	194.0	210.5	171.7	161.9
(short-term)	(51.3)	(96.1)	(134.0)	(146.7)	(113.0)	(103.8)
External Asset	308.6	366.7	417.7	422.5	348.2	345.5
(short-term)	(212.4)	(242.8)	(266.3)	(261.8)	(279.6)	(278.8)
Banks	53.0	63.2	76.4	84.5	83.0	77.3
(short-term)	(39.0)	(39.9)	(45.5)	(51.9)	(52.4)	(47.2)

Source: ECOS, Bank of Korea.

The riskiness of the banking sector may not be coincidental. Figure 2 plots the rate of growth of the banking sector's external debt percentages and the short-term external assets to short-term external debt ratios during 1995:Q1–2008:Q4. There is a negative relationship between these two variables, which indicates that when banks accumulate external debt, they tend to rely more on short-term debt. Thus, when banks accumulate external debts, both the risks of currency mismatch and of maturity mismatches tend to increase.

Before the global crisis, the banking sector pushed up leverage in Korea, while after the Lehman collapse, it suffered most from Korean deleveraging. This can be clearly seen from Tables 2 and 3. They present the flows of foreign liquidity funds in the pre-crisis and crisis periods, respectively. During 2006:Q1–2008:Q3 of the 168 billion dollars flowing into Korea, 137.4 billion dollars were funded by the banking sector, 68.3 billion dollars were domestically absorbed, and the rest were recycled through overseas equity investment, foreign direct investment, remuneration of foreign equity investment, etc. During this period, the monetary authorities were net sellers of foreign liquidity.

Table 3 indicates the sudden stop and reversal of capital flows during the global financial crisis. Between 2008:Q4 and 2009:Q1, 42.8 billion dollars in assets were taken out of Korea. This deleveraging was concentrated in the banking sector, as it was not able to roll over its short-term debt. Even though the Korean government guaranteed banking sector debts, lenders withdrew 59 billion dollars while the banking sector recovered 9 billion dollars. The monetary authorities sold 25.2 billion dollars of reserves.

TABLE 2
Uses and Sources of Foreign Exchange Liquidity
(2006:Q1 to 2008:Q3, \$US billions)

Uses		Sources	
External Asset		External Debt	
General Government	5.0	General Government	15.8
Banks	33.2	Banks	137.4
Other Sector	15.3	Other Sector	63.0
Monetary Authorities	14.8	Monetary Authorities	21.5
Overseas Equity Investment	68.2	Foreign Equity Investment	-78.2
Overseas FDI	34.5	Foreign FDI	6.1
Financial Derivatives	-0.6	Other	5.1
Other Investment	6.2	Current Account	-2.7
Other Capital Account	-7.0		
Error and Omissions	-1.5		
Total	168.0	Total	168.0

Source: Computed from Bank of Korea *Monthly Bulletin*.

TABLE 3
Uses and Sources of Foreign Exchange Liquidity
 (2008:Q4 to 2009:Q1, \$US billions)

Uses		Sources	
External Asset		External Debt	
General Government	-9.1	General Government	-5.2
Banks	-8.9	Banks	-58.9
Other Sector	-4.0	Other Sector	2.7
Monetary Authorities	-25.2	Monetary Authorities	5.3
Overseas Equity Investment	-8.2	Foreign Equity Investment	-4.0
Overseas FDI	3.2	Foreign FDI	1.4
Financial Derivatives	13.9	Other	-0.1
Other Investment	-1.4	Current Account	16.1
Other Capital Account	-2.1		
Error and Omissions	-1.3		
Total	-42.8	Total	-42.8

Source: Computed from Bank of Korea *Monthly Bulletin*.

As described above, Korea's experiences during this crisis can be summarized in terms of *the capital inflows problem*. Procyclicality generated by capital flows has been a major cause of vulnerability for small open economies as they can cause boom-bust cycles (e.g., Kaminsky et al., 2005). Excessive foreign capital inflows lead to current account deficits and can cause asset bubbles and increase vulnerability to external credit tightening, which often result in sudden stops and reversals of financial flows. Since the East Asian crisis, the Korean economy has progressed towards closer integration with global financial markets. Its liberalized capital market has invited foreign capital inflows—but this has also enabled foreign investors to unwind their positions at the earliest signs of trouble.

The procyclicality of the banking sector borrowing can be confirmed in Figure 3. It plots the growth rates of foreign assets and debt calculated from the banking sector balance sheet during 1995:Q3 to 2009:Q1. Dots tend to be on the 45-degree line, which implies that once the banking sector as a whole increases its foreign debt its balance sheet expands in lockstep, and vice versa. Through financial intermediation the growth of foreign debts is translated into growth of foreign assets, which push up domestic demand through various channels.

How important is the procyclicality of capital flows originated in the banking sector? Table 4 lists measures of procyclicality of various components of net capital inflows to Korea. Surely, capital flows driven by the banks are the most problematic.

FIGURE 2
**Korean Banking
 Sector Risk**

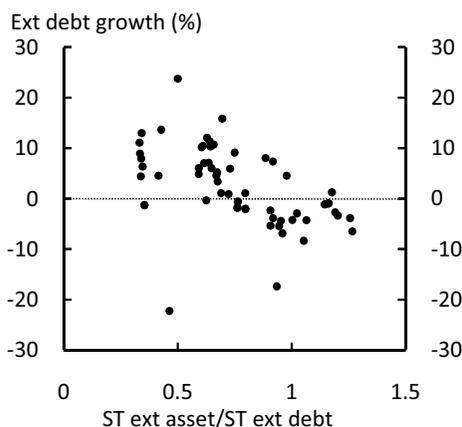


FIGURE 3
**Procyclicality of
 Korean Banking Sector**

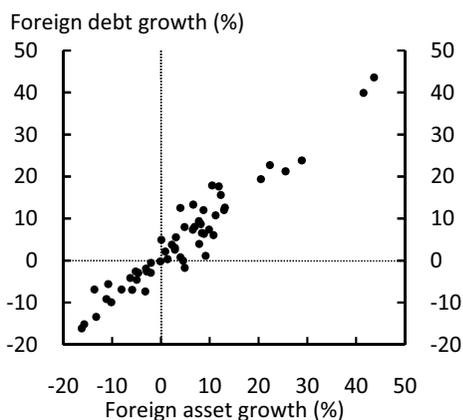


TABLE 4
Procyclicality of Capital Flows: Korea

	1995-97	2000-08	2000-05	2006-08
Net Capital Inflows	0.64	0.47	0.12	0.94
FDI	-0.53	0.04	0.13	-0.31
Equity	0.40	0.18	0.18	0.03
Bond	0.18	0.24	-0.13	0.70
Others	0.71	0.33	0.06	0.87
(Bank)	(0.64)	(0.41)	(0.00)	(0.92)

Note: Procyclicality is measured as the coefficient of correlation with quarterly real GDP growth rate in percent against previous year.

Korea's recent experience offers important policy implications. Capital account liberalization in small open economies increases vulnerability to sudden large-scale withdrawals of foreign capital, and that is exactly what we have witnessed during the recent crisis. It should be noted that this problem has even occurred in countries with strong financial regulation and transparent financial systems such as Korea.

It has been argued that financial globalization makes it possible to enjoy collateral benefits such as domestic financial sector development, institutional improvements, better macroeconomic policies, etc. These collateral benefits have been said to result in higher growth for the globalizing countries, generally via gains in allocative efficiency. The recent crisis has demonstrated, however, that financial globalization can lead to collateral damage in emerging

market economies as well. Therefore, better management of financial openness in emerging market countries is the key issue (Committee on the Global Financial System 2009 and Choi and Kim 2010).

One could defend oneself from such collateral damage by sufficient reserve accumulation. But here the question arises: How sufficient is sufficient? According to the Greenspan-Guidotti-Fischer rule, short-term borrowing abroad by the private sector should be absorbed as foreign reserves by the monetary authorities. However, the rule might invite moral hazard: While profits from borrowing are privatized, hedging of the associated risk is socialized (Rodrik 2006). Consequently, the private sector would like to rely on short-term borrowing even more and the monetary authorities must accumulate even greater reserves. Furthermore, the moral hazard problem exacerbates the overall level of capital inflows.

Direct regulation on capital flows may be another viable option. However, there is little evidence that capital controls are effective in achieving their macroeconomic objectives for longer than limited periods. The best solution, in my opinion, is to establish an incentive mechanism that can harmonize the individual player's optimizing activity in a way not to cause a deterioration of the system soundness, that is, by internalizing the cost of short-term external borrowings.

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NOTES

1 There are many other different ways to capitalize on potential arbitrage profits and, as a matter of fact, derivatives have been an important channel for capital inflows to Korea (Kim and Song 2009).

2 In response to the crisis, the Korean government conducted an aggressive expansionary fiscal policy. According to the IMF and the OECD, the ratio of stimulus package to GDP in 2009 was 3.4 percent and 4.22 percent respectively. These numbers are much greater than the G-20 and OECD averages.

3 The banking sector is composed of domestic banks and foreign bank branches.

Global Financial Crisis: Japan's Experience and Policy Response

Takafumi Sato

I happen to have served Japan's financial regulatory authority for more than 10 years until I stepped down as head of the authority last July. This means that I experienced both the current global financial crisis and Japan's last banking crisis in the late 1990s. I had the privilege of dealing with a big financial crisis, not only once but twice. Somewhat cynically, I sometimes consider, "What a lucky person I am!"

The scale of the current crisis has often been characterized as "once-in-a-century" or "the most severe since the Great Depression." Because I had such harsh experience, however, my feeling is that the current stress is instead a "second-in-a-decade" event.

Using this perspective, today I would like to explain the effects of the current global crisis on Japan's financial sector and the authorities' policy response. I will first describe the differences between the last crisis and the current turbulence in Japan in terms of their nature and magnitude. Second, I will touch upon the possible reasons why Japan's financial system has been less affected than the United States and Europe this time. Then I will move on to describe the measures taken in Japan in response to the current financial stress, which differ somewhat from those in the United States and Europe. Finally, I would like to raise a point regarding the manner in which the world's regulators should advance their reform agenda.

Comparing the Current Stress in Japan with the Last Crisis

There are divergent views as to how the effects of the current financial stress in Japan compare with the country's last banking crisis in the 1990s. Some argue that the magnitude of the last crisis was larger, as many financial firms failed and the economy remained sluggish over an extended period. However, others say that the current crisis is more severe as Japan's GDP and share prices have declined sharply.

These divergent views probably reflect the fact that the current stress differs significantly from the difficulties we faced in the 1990s. I would concentrate

on following four main sources of differences between the events. The first two are encouraging, but the latter two leave us pessimistic.

- First, the market turbulence in Japan this time was triggered by an exogenous shock, whereas the root causes of the last crisis were located within the country. The current financial stress in Japan stems mainly from the collapse of the housing and securitization markets in the United States, among others. In contrast, the crisis in the 1990s was the result of an endogenous shock, since Japanese financial firms had been deeply involved in the creation of the bubble in the domestic property market. As a result, their exposure to problem loans was much greater in the 1990s.
- Second, the regulatory framework and financial safety net have been improved significantly in Japan. In the early 1990s, we lacked both sufficiently effective frameworks for disclosure or provisioning with respect to nonperforming loans and sufficiently robust schemes for deposit protection and resolution of failed banks. The lack of these frameworks induced banks to postpone the disposal of their nonperforming loans, and led the authorities to avoid timely bank resolution in fear of its side effects. Based on the bitter experience that this lack of a reliable framework prolonged both financial distress and the economic slump, we have improved disclosure requirements, clarified the rules on write-downs and provisioning, put in place a prompt corrective action scheme, and established an early warning system that enables the supervisors to conduct intense monitoring of banks before they become undercapitalized. The deposit insurance and bank resolution schemes have also been strengthened, and a robust framework to deal with systemic risk has been put into place.
- Third, the impact of the market turmoil in one country spilled over quickly to other countries this time, including Japan. Since securitized products are traded on international markets, the current crisis has a strong cross-border character. Risks were scattered to a wide range of investors through the use of what is called the “originate-to-distribute” business model, and losses were dispersed globally. The global turmoil also hit Japan’s financial sector through a sharp decline of share prices worldwide. In comparison, the effect of Japan’s banking crisis in the 1990s was largely contained within its borders.
- The fourth point of difference is that the current market turmoil has resulted in what is likely to become the deepest global recession since the Second World War. In the late 1990s, the world economy sustained positive growth, in spite of Japan’s banking crisis, the Asian crisis, and the turbulence of the global markets that followed. However, in the *World*

Economic Outlook published earlier this month, the International Monetary Fund forecasts the world's real GDP growth for 2009 as -1.1 percent. The global recession has led to a serious weakening of Japan's real economy through severe contraction of its external demand. Japan's GDP recorded a negative growth of -12.4 percent on an annualized basis in the first quarter of 2009, and is projected to record an annual growth of -5.4 percent in 2009. The current global recession thus revealed vividly that Japan's economy is heavily dependent on its export sector.

Why Was Japan's Financial System Less Severely Hit This Time?

As I have just explained, Japan was not immune from the current global financial crisis. The financial system was severely affected by the high volatility of financial markets, including the sharp decline in the prices of equity shares held by banks. Meanwhile, the deterioration of the real economy affected banks' profitability in the form of increased credit costs, albeit on a limited scale.

Nevertheless, one can fairly say that Japan's financial system itself remains relatively sound compared with those in the United States and Europe. This recognition derives from the fact that the losses Japan's financial banking sector incurred from complex securitized products have been limited; as of the end of June 2009, the cumulative realized losses since April 2007 are about US\$25 billion, and the valuation losses are about US\$5 billion. These figures are one digit smaller than those of the American and European financial sectors. The exposure of Japan's financial sector to opaque toxic assets is also significantly smaller. This implies that future additional losses from these assets will be limited as well.

Why was Japan's financial system less exposed to the market turmoil and less severely affected in the current global crisis? There are some possible reasons for this relative soundness.

- First, it has been alleged that the soundness is simply a result of the fact that Japan's financial firms were not strongly innovation-oriented, and therefore not as exposed to the exotic financial instruments that experienced the greatest declines in value.
- Second, it is probably attributable to historical coincidence that Japanese financial firms were concentrating on improving their financial soundness rather than enhancing their profitability in the last several years. When the originate-to-distribute business model became widespread, it happened that Japan's financial firms were at the final stage of resolving their nonperforming loan problems.
- Third and finally, some observers point out that the risk management practices of Japan's financial firms were improving during the pre-crisis

period. Firms became more cautious than before about investing in financial products with uncertainty in their underlying assets or associated risks. Early implementation of the Basel II framework in Japan has also contributed to improving financial practices.

I think there is some truth in every anecdote but, being a former financial regulator, I am naturally most attracted to the third possible reason.

Stabilization Measures Taken in Japan

Let me now move on to describe the short-term stabilization measures taken in Japan in response to the current market turmoil. As I mentioned earlier, the features of these measures seem to differ considerably between Japan on the one hand, and the United States and Europe on the other.

The U.S. and European authorities have taken a number of extraordinary actions to stabilize their financial systems. They include large-scale capital injections with public funds, temporary bank nationalizations, and government bank debt guarantees, as well as massive liquidity provisioning by central banks. Meanwhile, few of these extreme actions have been taken in Japan in response to the current turmoil.

This difference reflects the fact that the shock Japan has suffered in the current turmoil is exogenous. In other words, Japan's financial system suffered from external injury, not from a disease of internal organs. Therefore, most of the short-term policies in Japan are aimed at preventing the external injury from turning into a serious internal disease. More specifically, the measures we took can be classified into three types.

- The first type is the measures to *preserve the soundness of the financial sector*. For instance:
 - We conducted stress tests with financial firms on a regular basis to ensure the maintenance of financial sector soundness.
 - We also did our best to identify the potential spillover effects of overseas events, such as the collapse of Lehman Brothers and the public intervention into AIG (American International Group) as quickly as possible.
 - Based on these efforts, we expressed our concerns to financial firms that could be significantly affected by these external shocks, and urged them to take remedial actions as necessary.
- The second type of measures is aimed at *maintaining the functioning of the financial markets*. For example:

- We banned naked short selling of shares and enhanced disclosure on short selling. The objective of these measures was not to keep a specific level of share prices, but to avoid extreme price volatility and to support the pricing function of the markets.
- Also, in response to the market turmoil that followed the Lehman collapse, we at the Financial Services Agency coordinated with the Bank of Japan and relevant government agencies with respect to government or central bank purchases of qualified commercial papers and bonds in an effort to provide liquidity.
- The third type of measures is focused on *sustaining bank lending* in order to support activities in the real economy. They include:
 - Providing capital injections, which can be used by banks voluntarily to maintain a sufficient capital base and sustain their lending.
 - Intensive supervisory review of banks' lending practices to ensure that their financial intermediary functions work properly.

The Right Balance between Crisis Management and Reform

In parallel with these short-term measures, the world's financial regulators are advancing medium-term reforms to strengthen financial regulation. Discussions are under way globally regarding the capital adequacy of banks, procyclicality in the financial system, market integrity and transparency, and international cooperation among regulators. Here, I would like to emphasize that the right balance needs to be struck in implementing short-term stabilization measures and medium-term regulatory reforms.

On the one hand, crisis management measures should not remain in place over a prolonged period, as some of them include exceptional actions with large-scale public support. Leaving these in place too long could cause moral hazard in the marketplace or distort the system in the longer run. On the other hand, too hasty implementation of medium-term measures could rather exacerbate the situation and impede economic recovery. This is the reason why the Pittsburgh G-20 Statement has made it clear that the rules to improve bank capital "will be phased in as financial conditions improve and economic recovery is assured."

The implementation of regulatory reform needs to be well timed and carefully sequenced. Financial regulators should be reminded that tightening regulation is not a goal in itself; it is rather a means to ensure that the financial system plays its indispensable role of supporting the broader economy.

GENERAL DISCUSSION

Panel on Experiences with the Crisis

Chair: Kevin M. Warsh

Mr. Warsh: I think one common thread among markets throughout the recent financial panic and the emerging recovery has been a change in the value of asset prices. So if I looked at the stock market performance for Asian countries from their March 9 [2009] lows until present [October 2009], the stock markets are up an average of about 95 percent. Now, they're still off their highs that preceded the crisis, but it's a remarkable move. Certainly the U.S. has also seen a remarkable increase in asset values, and my moderator prerogative question would be, how important is this increase in asset values to your perspectives on the return to more normal economic conditions? I'll make that the first question, but perhaps we can open it up here to a first group of questions.

Mr. Kashyap: I've got a question for Sato-san. Now that you're no longer an official, I don't know whether you can answer this question, but I found it inconsistent with good risk management practices that the Japanese institution that had committed to buy Morgan Stanley went ahead with that transaction at the pre-agreed price. I understand for policy coordination reasons it was incredibly valuable, but I think shareholders got ripped off and they should have renegotiated more. I'm wondering why the FSA (Financial Services Agency) stood by and, I'm sure, probably encouraged that transaction. But given the price at which that transaction was concluded, I never understood how it was consistent with the fiduciary duty that management has to shareholders, because the minute it was consummated there was a huge, huge loss. I think a U.S. institution would have walked away, and I don't know if the U.S. government could have compelled them to go ahead. I'd like to hear what you can say about that.

Mr. Warsh: Questions in the back?

Mr. Bery: This is to some extent similar to the question I asked Andrew Crockett yesterday. There was this great reflection after 1997 about the source of the Asia crisis and the responses to the crisis that led to a series of initiatives we haven't really talked about—the Asian bond market initiative and bilateral swap lines in the region, for example. The fact that these initiatives have

not been mentioned at all, does that mean that agenda has been unsuccessful? Put more broadly, coming back to the point that Anne Krueger made yesterday, we're dealing with a highly successful bunch of countries in Asia which have now been badly affected by crisis twice in a decade. What does this do to the appetite for financial innovation? Certainly taking an Indian perspective, I think most Indian policymakers—Rakesh Mohan is here, he can contradict me—would basically say that if this is the price of being integrated, maybe we need to shop elsewhere. So, is there any kind of revulsion or reaction politically against financial integration? I mention that because Swee Keat talked about financial integration as being one of the things on the agenda. So what's the political climate on this issue when, as Sato-san indicates, in living memory you've had to go through two of these crises?

Mr. Warsh: Let's gather one more question in this round. Rakesh?

Mr. Mohan: Mr. Kim you described the huge increase in Korean banks' external short-term debt. Did the regulatory authorities not have a view about whether something bad or not good was happening during that time and whether some regulatory action should have been taken? Was there discussion about this or did it just happen without the regulator knowing what was going on?

Mr. Warsh: Perhaps we can get some quick answers to this round of questions.

Mr. Heng: I'll address the question about financial integration in the region. I think it is important for Asia to continue to pursue more integration, but there are a number of preconditions that you need. First and foremost is that the national authorities need to develop their own markets first, because only when you have a fairly deep internal market can integration proceed. In that regard you see efforts across different countries, certainly the bigger ones. China and India have been developing their financial markets as have the ASEAN countries. Now, there are also more regional efforts in bond market development and those efforts are ongoing. More recently there has been the Chiang Mai initiative to multilaterally pool reserves. But these are part of a broader effort that will take time and will evolve as real economy integration takes place. Real economy integration has become deeper through a series of trade agreements—within ASEAN, and ASEAN-China, ASEAN-Japan, ASEAN-Korea, ASEAN-India, ASEAN-Australia and New Zealand. All these agreements will bring the real economies in the region closer together.

The problem, as I pointed out, is that this has led to an extremely efficient cross-border network of production and trade in intermediate products, but

not so much in final goods for intra-Asian consumption, which I think is what's needed going forward. But the development of the real sector and development of the capital markets and the banking sector will grow in tandem. It's not going to be a fast process—you need to take a longer-term view to look at progress, because if you take a short-term view, there isn't much that seems to be happening. But as efforts continue, I'm quite confident that we will see progress over a number of years.

Mr. Kim: When you compare the 1997 East Asian crisis to the current global financial crisis, in the 1997 crisis the problems started on the asset side of the banking sector balance sheet with nonperforming loans, but in this crisis the problems have accumulated on the liability side with debt problems. I would like to say that banks are doing their best now; but although they are very rational, their behavior has had negative side effects on the rest of the economy. So, you need to change the behavior of the banks. Simple rules and regulations or controls won't work, because there are many ways to circumvent them. In other words, you should find a solution to the problem of distorted incentive mechanisms in the rules and regulations, to lead banks to internalize these negative externalities caused by their own activities.

I also want to point out that there is another reason for the accumulation of short-term debt that can be called a winner's curse. In the shipping industry, for example, there were huge foreign exchange revenues that the firms wanted to hedge. The banks secured their positions with bridge financing. But that created a negative externality for the rest of the economy.

Mr. Sato: As regards the Mitsubishi UFJ Financial Group move to invest in Morgan Stanley, usually Japan FSA's basic position is to respect the decision of the financial entity itself and its own business judgment. Of course, if it seems to be an irrational investment, we would certainly examine it from the viewpoint of its effect on bank financial soundness. But I think, in truth, this investment was carried out on a fairly independent basis, making the best use of U.S. asset evaluators, law firms, and so on. So, we welcome such moves if they are based on rational and forward-looking considerations that enhance bank profitability and maintain financial soundness.

As regards innovation in the last few years, I feel that the word "innovation" can be rather ambiguous in meaning. For a typical competent aggressive investment banker, innovation could be a clever tool to evade rules-based regulation in a lawful and profit maximizing manner, while from the viewpoint of the regulator, such as the FSA, financial innovation may take the form of a new technology which enables more efficient and broad-based financial intermediation. For

example, securitization, if it is used properly, could enable the banking sector to lend more to small and medium-size enterprises that would not have been lent to with ordinary lending practices. Innovation also allows the banking sector to provide new types of financial products with different risk and return profiles. This sort of innovation would be socially desirable. We can't stop innovation by regulation, but we should pay attention to the real effects of innovation, such as whether it is wrongly used simply to maximize short-term profits.

In the case of the originate-to-distribute business model, financial market players thought that they could eliminate the risks on the assets they bought by selling them immediately. This kind of moral hazard induced them to avoid real due diligence, which is indispensable in financial transactions. So, we have to be careful.

And with regard to financial integration, this is not something that we regulators can stop by policy. We have to live with financial integration and with innovation as well. So, as Sir Andrew Crockett noted, we have to live in a market-based world. In that environment, we must give our best efforts to bring about the best allocation of resources and the best provision of financial services from the social point of view.

Mr. Warsh: Thanks, Taka. Let's go back to round two of questions. We'll survey the group yet again. Start with Peter.

Mr. Hooper: A strong conclusion from the preceding discussion was the importance of developing effective resolution mechanisms. Could you comment briefly on how resolution has evolved since the previous crisis and how that may have affected the outcome this time?

Ms. Curran: You each have a unique perspective on the coordination between your country's regulatory authority and the monetary authority. I'm wondering if you could share your perspectives on the effectiveness of that coordination during the crisis and any lessons that you're bringing forward.

Mr. Kohns: A question to Mr. Sato. When you explain the differences between the past crisis and the current crisis, you stressed a lot that the current crisis is more of an exogenous shock. My question is that, given the size of this exogenous shock, one can imagine that the endogenous reaction of the banking sector to the shock is going to build up in the coming months. In particular, I can imagine that the share of nonperforming loans is likely to increase. What is your perspective on future bank lending and future burdens on bank balance sheets? Could this be an impediment to a stronger recovery as the credit supply is increasingly restricted when loans start to become nonperforming?

Specifically, could you elaborate a bit on the outlook and future burdens on the banking sector in Japan?

Mr. Warsh: Let's go to the front and then we'll take one more question in the back and see if we can't get those answered by the panel.

Mr. Ito: Question to Mr. Kim. You mentioned the many regional arrangements growing in Asia, but when you were pressed for dollar liquidity Korea went to the Federal Reserve for a swap line. I understand you didn't go to the IMF because of your experience 10 years ago. But you could have drawn on the Bank of Japan swap, or utilized the CMI (Chiang Mai Initiative) arrangements. I don't think that a bilateral swap with the BOJ would have triggered the IMF linkage clause. So while there were some other opportunities available to obtain funding, you chose to go to the Federal Reserve. What was the reason for that?

Mr. Warsh: I think we have room for one more question in this round. David.

Mr. Hale: Actually I have two questions for Mr. Kim. Would you ever consider having a currency swap with China someday, which now has massive foreign exchange reserves? Mr. Heng Swee Keat, just a question on the issue of asset markets. Many fund managers believe that we're now headed into a period of asset bubbles in East Asia. The most explicit example of this would be Hong Kong, which has a very direct monetary link to the United States through its currency board. Their monetary base has gone up 145 percent in the last year, the stock market's boomed, and there's been a huge increase in the last few months in property values. Do you fear the same could now happen to Singapore and Malaysia and other countries in the region because of the low interest rates here, capital outflows, and the desire of Asian central banks to restrain exchange rate appreciation by accumulating further large increases in their foreign exchange reserves?

Mr. Warsh: All right, that completes the questions for this round. Who among the panelists wants to go first? Swee Keat, should we start with you again? Maybe you can speak to the asset price question that David raised. So, to what extent are the asset price increases that we see in Singapore and across the region being taken into account in the conduct of policy, and to what extent is that either a headwind or a risk as you think about policy going forward?

Mr. Heng: I will address both questions. One is our experience with coordination during the crisis. In the case of the MAS (Monetary Authority of Singapore), we're quite unique because we're both a central bank and the regulator of banking, insurance, and capital markets. I think putting everything under one

roof has its hazards, but during the crisis we found it to be extremely useful for a number of reasons. One was that it gave us a fairly good view of what was happening everywhere and an understanding of the interlinkages across different sectors of the financial markets. Before Lehman collapsed, we had intensified our monitoring. When the collapse happened the stresses were extreme, but we were able to coordinate policies across different functions. Even though Lehman had only a small operation in Singapore, there were large effects across different sectors. And when AIG got into trouble, when Fortis Bank was in trouble, and so on, we found that our very extensive relationships with both central banks as well as regulators across the globe were extremely helpful. We were in contact with other regulators and central banks constantly, particularly since Asian markets open first each day. I think it worked well, and right now, in terms of the discussion about macroprudential supervision, we have an internal financial stability group that pools information from various sources and we meet regularly to monitor what is happening across the different markets and how different developments interact with each other. There were many things that surprised us in the course of doing that, such as how the interaction across sectors was so extensive.

On the issue of the rebound in asset markets in the region, regulators and central banks in the region are paying a lot of attention because liquidity conditions are extremely accommodative. We need to watch how conditions develop. In our case, because we are also a regulator, we have additional tools and don't think that we should use monetary policy in a blunt way because monetary policy has to respond to current and future real economic conditions. We need to keep a very clear focus on using monetary policy to anchor inflation expectations and to make sure that we don't use it for more than it can deliver. We also have a range of macroprudential tools and we have used them. In fact, just three weeks ago, we ended a scheme which allowed banks to absorb the interest on property loans. The use of macroprudential tools is not unique to Singapore. For example, across Asia loan-to-value ratios for mortgages have been lowered. These are simple tools to limit leverage so that it does not damage the banking system. We will have to continue to watch developments very carefully and be prepared with a range of responses.

Mr. Warsh: Thank you. Kyungsoo, similar questions to you on policy coordination and asset prices, and also on your use of swap lines.

Mr. Kim: There is coordination between the Korean FSS (Financial Supervisory Service), the Ministry of Finance, and the Bank of Korea. We do have coordination on a regular and also irregular basis and very recently imposed

debt-to-income limits when the authorities became concerned about asset price bubbles, especially in the real estate market. And in order to limit bank balance sheet problems, the government announced it will impose, revise, and update rules and regulations which will take effect very soon. Meanwhile, it was difficult to consider a swap line with the IMF due to strong concerns that receiving financial support from the IMF might have an adverse effect on the market credibility of the Korean economy.

Mr. Sato: In regards to Japan's bank resolution mechanism, I think there have been some clear elements of improvement since the late 1990s. One improvement is that the central purpose of bank resolution is now to preserve the stability of the financial system itself, not to protect individual banks, their managers, or their shareholders. This notion is well shared nowadays between government departments including the central bank. So this is progress.

The second improvement is that objective standards for triggering the beginning of the resolution mechanism have been made clearer. We introduced American-type prompt corrective action procedures based on a bank's capital ratio. As the capital ratio goes down, we give warnings to the bank to take remedial actions, but if this can't be carried out successfully, then it goes into insolvency. With this clear standard, now we hesitate less to go into bank resolution, and this helps avoid situations in the past where we tended to forebear resolution for fear of side effects. The manner of resolution is now clearly stipulated as well. We can send a government-designated new manager to a problem bank immediately and shift the overall capabilities to that new manager. With regard to the use of public money, we had a very harsh experience in the 1990s and this is a very touchy issue politically. We introduced a framework in which, when there is no real threat to the stability of the financial system as a whole and when it is simply an idiosyncratic phenomenon without much systemic significance, then problem banks go into ordinary resolution in which the shareholders and depositors have to share the burden of losses. So, these kinds of overall guidelines are much clearer than before; that's progress.

In regards to the future prospects of Japanese banks, it is true that the current stress represents a kind of exogenous shock for Japanese banks. But their exposure to toxic assets has been rather limited, so their losses on these assets should be limited as well. Now, the risks for Japanese banks are twofold. One is rising credit costs due to the deterioration in the real economy. But so far the rise in credit costs has not been so strong, and it has been managed by banks with ordinary revenue. However, if the world economy doesn't pick up quickly, then Japan's real economy could continue to stagnate and would be reflected in

higher credit costs for Japanese banks. Another risk stems from Japanese banks' rather large exposure to equity price changes. We have a framework introduced several years ago in which Japanese banks have to include their holdings of equity shares within their Tier 1 capital. Now equities are roughly 50 percent of their Tier 1 capital, but the banks incurred substantial losses from the sharp decline in share prices worldwide recently. So the Japanese FSA is encouraging them to improve the risk management of their shareholdings. If they want to maintain the present level of shareholdings, then they should try to increase their capital. And if they do not intend to raise additional capital, then they should reduce their shareholdings. These kinds of discussions are ongoing. I personally don't like outright regulation. So, for the time being we will let Japanese banks make their own decisions.

Mr. Warsh: Thank you, Taka. Swee Keat, the final comment on swaps.

Mr. Heng: Let me make a quick clarification on Singapore's swap facility with the Federal Reserve. The swap with the Fed is a central bank to central bank arrangement, and we can use these funds only to help banks ease funding liquidity in U.S. dollar markets. Singapore has entered into a swap agreement with the U.S. Federal Reserve because we are a very major U.S. dollar funding center. We did that as a purely precautionary measure. We see that the action taken by the Fed with the ECB, the Bank of Japan, and others was very important in restoring stability and confidence in U.S. dollar funding. But we cannot use it for government expenditures. In contrast, the swap line with the IMF and the bilateral swap agreement can be used to manage balance of payment problems. So, these are completely different creatures.

Mr. Warsh: Thank you very much, Swee Keat, Kyungsoo, Taka. I think it's been a very useful panel.

The Financial Crisis and Global Policy Reforms

Barry Eichengreen

1. Introduction

Given the profusion of papers on the financial crisis, the decision to write another requires some justification. I have accepted the commission for this one because it is designed to address an aspect of the problem that remains understudied, namely the design and coordination of global policy reforms. Scads have been written on reforming national financial markets. But the reach of financial markets and institutions is global. Although lip service has been paid to the need for global coordination of those national policies, progress remains halting. Whether in fact there will be a response justifying the label “global policy reforms” remains an open question.

My analysis is in two parts, corresponding to the two main explanations for the crisis. The first explanation sees the crisis as rooted in inadequate regulation and distorted incentives in financial markets. The second sees it as the result of a global savings glut that fueled an unsustainable credit boom in the United States. The debate between these two viewpoints—not so much their validity as the weight to be attached to them—will be played out in the history books. For present purposes I do not attempt to rank their importance.¹ I simply assume the validity of both explanations and, by implication, their compatibility. In each case I draw first the lessons of the crisis and then the implications for policy.

2. National Financial Markets and Global Policy Reforms

The first explanation for the crisis focuses on distorted incentives in financial markets and the failure of regulators to contain their effects. Deregulation, as symbolized by the Gramm-Leach-Bliley Act in the U.S. and the Single Market Act in Europe, allowed financial institutions to take on additional risk. The resulting intensification of competition encouraged them to do so in response to the pressure to survive. Risk-taking was fueled by the knowledge that big banks were important for financial stability—that they stood to receive official assistance in the event of difficulties. Compensation schemes for investment managers, whose bonuses depended on current performance irrespective of the future profitability or even viability of the firm, encouraged strategies that maximized

short-term returns at the expense of long-term stability. The originate-to-distribute model of securitization allowed firms to neglect the long-term performance of the securities they issued since the originating entity had no skin in the game. Rating agencies, lacking reliable models of delinquency probabilities on subprime mortgages in a down market, failed to warn of the risks. As advisors on structuring securitizations as well as issuers of ratings, they faced conflicts of interest.

Regulators, meanwhile, lacked the resources to keep up with the regulated. They bought into the argument that the banks' internal models provided reliable forecasts of value at risk and that improved ability to diversify, repack-age, and otherwise manage risk justified ever-lower capital ratios as necessary to minimize the costs of financial intermediation. The fragmented structure of regulation within and across countries meant that no single regulator possessed a comprehensive picture of the regulated. The fragmentation of regulation also created scope for regulatory arbitrage—for bank and nonbank financial firms to shift risky activities both to more permissive jurisdictions and off-balance-sheet, where capital charges could be evaded.²

2.1. Policy Implications

From this diagnosis flows a prescription. First, regulators should require banks to hold more capital. By giving bank shareholders something to lose, capital is a disincentive for excessive risk-taking. It is also a buffer against risks to the balance sheet. Well-capitalized banks are less likely to be driven into insolvency by shocks. They are less likely to lose the public confidence that is critical for the willingness of other market participants to do business with them. They will be better placed to expand their balance sheets when investment opportunities arise.

Against this backdrop it is striking that Tier 1 capital (banks' core capital as defined in the Basel Capital Accord) has been trending steadily downward in the advanced economies in recent decades, reflecting the belief that lower capital requirements reduce the cost of financial services and that banks can safely manage their affairs from a narrow capital base. The result is that Tier 1 capital in the United States has effectively gone negative in every recent recession. The traditional response of regulatory forbearance to allow the banks to earn their way out of this hole becomes less feasible in an era of mark-to-market accounting. Much higher Tier 1 capital requirements are the obvious answer.

At the same time they adjust capital requirements upward, regulators can usefully revise them along a number of additional dimensions. Capital requirements should apply to the consolidated position of the institution whether

investments are held on or off balance sheet.³ Required capital ratios should be predicated on realistic holding periods.⁴ They should reflect not just the volatility of banks' investments but also the volatility of their funding. They should reflect the risk posed by failure of the individual institution to the stability of the financial system; from this flows the conclusion that more capital should be required of big banks and connected banks. Required capital ratios should have a countercyclical influence; they should rise when a bank's balance sheet is expanding, rather than falling because its internal model signals less value at risk or the rating agencies upgrade the securities in its portfolio.

Second, there is the need for a resolution regime for systemically significant nondepository institutions (both banks and nonbanks) to create a third way between government assistance and uncontrolled bankruptcy. A commitment not to extend a bailout will be time-inconsistent in the absence of a resolution regime. Auto companies can keep selling cars even while under bankruptcy protection.⁵ But standard bankruptcy procedures are not feasible for financial institutions which require people to believe in their solvency in order to keep funding them. In addition to the confidence problem there is the fact that putting a financial institution through bankruptcy can place derivatives contracts in limbo, resulting in a domino effect destabilizing other institutions as claims are suspended and collateral is frozen.⁶

The very fact that the United States has the Federal Deposit Insurance Corporation (FDIC) as an alternative to bankruptcy for banks is an indication that the country needs an equivalent resolution mechanism for bank holding companies. But while we have the FDIC for banks like the old Citibank, we do not have the equivalent for bank holding companies like Citigroup. Bank holding companies in the United States are regular corporations and are therefore subject to regular bankruptcy procedures that lack preemptive provisions.⁷ The U.K. similarly has a special resolution regime for deposit banks as of 2009 but not for merchant banks and other nonbank financial institutions. So long as this remains the case, moral hazard will be a problem, and potentially a serious one.⁸

A resolution regime for these entities would have the following features.⁹ The regulator would be empowered to appoint an administrator. The administrator's powers would include firing the management and board and suspending the voting and other decision rights of the shareholders and unsecured creditors. The administrator could ring-fence specific activities (securities clearing, settlement and custodian activities) and instruments (derivative securities, etc.). He could transfer deposits to another bank, sell assets, and mandate debt-for-equity swaps, and finally break up the institution or order its liquidation.

Third, supervisors must be provided with the information they need to make informed assessments of risks to stability. This means not starving regulatory agencies of the resources required for information gathering.¹⁰ It means imposing reporting requirements on hedge funds and other nonbank financial institutions of potential systemic significance, requiring them to provide information relevant to the regulator's micro- and macroprudential tasks.¹¹

Fourth, regulators should address problems in markets for derivative securities. They should seek to better align the economic interests of originators and investors by requiring the originator of any securitized asset to retain a meaningful portion of the equity or first-loss tranche. This will give the originator a stake in the subsequent performance of the issue. The Treasury blueprint for reforming the U.S. financial system proposes that the originator should be required to hold 5 percent of each issue.¹² It can be argued that 5 percent is not enough—that the originator's skin should be thicker. The Committee on Capital Markets Regulation argues the other way: it warns that such measures may result in greater concentration of risk for financial institutions.¹³ But, if so, then they should be accompanied by higher capital requirements. This may make originating such securities more costly, but such is the price of a stable financial system.

Further, regulators should move over-the-counter derivatives transactions into a clearinghouse where there exists a central counterparty. The central counterparty is the single buyer and seller to every other party. It collects margins on every trade and places them in a reserve fund to protect against losses if other parties default. Traders only have to worry about the creditworthiness of this one counterparty. If any single trader goes under, this is unlikely to create the kind of domino effect that resulted from the failure of Lehman Brothers. The central counterparties of some derivative securities (such as interest rate swaps) are already cleared by LCH.Clearnet Group Ltd. Credit default swaps (CDSs) based on indices have been cleared by Intercontinental Exchange's central counterparty service since March 2009. The authorities in the U.S. and Europe have announced the intention of further expanding their use of central counterparties for clearing over-the-counter derivative products. Better still would be to move transactions onto an organized exchange whose members commit their capital jointly and separately to guarantee transactions.¹⁴

Fifth, the compensation practices should be reformed to better align the interests of key decisionmakers and shareholders. Officials are reluctant to interfere in these intimate private sector matters, preferring to leave compensation decisions to the consenting adults involved. But experience suggests that corporate boards do not always have the independence and outside directors do

not have the information needed to make decisions to appropriately incentivize those they oversee. Bonuses linked to the performance of the trading desk, division, or firm in the most recent year can encourage practices that inflate current returns at the expense of the long-term viability of the firm. A compromise would be to leave decisions regarding overall compensation to the firm but require that bonuses be linked to medium- rather than short-term performance and mandate that they be clawed back in the event of subsequent problems.¹⁵

Sixth and finally, there should be an agency responsible for macroprudential supervision—for the stability of the financial system as opposed to just its constituent parts.¹⁶ In the U.S., the Barack Obama Administration would create a Financial Services Oversight Council chaired by the Treasury (and with its own permanent professional staff) to identify potential risks to systemic stability and give the Fed regulatory power over individual systemically important financial institutions. In the U.K., the Gordon Brown Government proposed vesting the Financial Services Authority, the U.K.'s unified regulator, with this responsibility. The European Union (EU) would create a European Systemic Risk Council made up of individual European central banks and regulators and chaired by the president of the European Central Bank (ECB).¹⁷ Other countries have yet to fully specify how they would organize macroprudential supervision.

2.2. Challenges at the National Level

Implementing these principles at the national level is not straightforward. To start, moving to higher capital requirements creates a transition problem. Assuming that there is no appetite for a taxpayer gift to the banks, it implies a long period of subdued lending as banks limit the growth of the denominator of the capital-to-assets ratio. Then there are practical issues of how to reform other dimensions of capital adequacy requirements. While it may be straightforward to index capital adequacy to the size of a financial institution, size really is of concern only insofar as it has implications for systemic stability. Size in and of itself is a poor proxy for the threat to systemic stability posed by the failure of a particular institution; the variables of interest are systemic importance or connectedness. And it is not clear that regulators know how to measure these things.¹⁸

Indexing capital ratios to the cycle may similarly be less than straightforward. Should these be indexed to the growth of GDP or the growth of bank lending? There may be agreement that internal models and commercial credit ratings are weak bases on which to assess the riskiness of a bank's investments for purposes of capital adequacy, but it is not clear what to replace them with.

The current fashion is to supplement existing measures with a simple leverage ratio (the ratio of capital to unweighted assets). But the latter ignores entirely the correlations between the returns on different assets. It thus implies very different degrees of self-protection for different financial institutions.¹⁹

A special resolution regime will send a clear signal to banks' unsecured creditors that they too are at risk in the event of insolvency—that their claims will be wiped out if the institution is dismantled and that their claims will be liquidated or converted from debt to equity if it is restructured and allowed to continue. But this will make it more difficult for banks to access debt finance precisely when capital is scarce.²⁰ Then there is the question of to what entities exactly the special resolution regime should apply: insurance companies, hedge funds, finance companies, and credit unions as well as banks, for example?²¹ Finally there is the question of who in a fragmented regulatory system activates the special resolution regime. The Insurance Commissioner of the State of New York regulated AIG's investment activities, the Pennsylvania Insurance Department its property and casualty businesses, and the Delaware Insurance Department its life insurance business. Which would be responsible for determining that the company had failed to meet the threshold conditions for financial solvency?²²

To ensure adequate information on hedge-fund operations, U.S. regulators are moving toward a system where all hedge funds register with the authorities. Under the Treasury's July 15, 2009, proposal, hedge funds, private equity funds, and venture firms with more than \$30 million in assets would be required to register with the Securities and Exchange Commission (SEC) and to report assets, leverage, off-balance-sheet holdings, and other investments on a confidential basis.²³ The SEC would possess power of examination and the right to share this information with other regulators. But the form and content of these "periodic" reports remains to be specified. And the speed with which hedge funds trade raises questions about the timeliness of the information. Information on last week's hedge fund portfolio is at best only marginally more informative than no information at all.²⁴

Neither is requiring underwriters to retain a portion of any security they issue as straightforward as it may seem. Financial engineers would be quick to identify other securities that are correlated with the issue in question and short them as a way of hedging out the position and its implications for behavior. Long positions in other investments whose returns are negatively correlated with the issue could be used to the same end. It is hard to imagine that requiring the originator to hold onto a fraction of the issue would have much impact on behavior when the entire portfolio was taken into account.

And even ignoring the scope for hedging, it is not clear that requiring a bank to hold on to 5 percent of the issue, as proposed by the Obama Administration, would have much impact on its underwriting activities. Investment banks in fact had been forced to warehouse more than 5 percent of the subprime-related securities issued in the late stages of the housing boom, and this did not deter them from originating them as fast as they could. Requiring the underwriter to retain a larger share of the issue might have more substantial effects, but this could result in dangerous portfolio concentrations.²⁵ And even then, to the extent that underwriting and investment decisions take place in different arms of the financial group, it is not obvious that the exposure of those responsible for the latter will impact the behavior of the former.

Forcing transactions in derivative securities through a clearinghouse or exchange would have costs in terms of instrument diversity, since only a limited number of securities subject to a critical mass of transactions would be feasible for centralized clearing and exchange-based trading. Offering customized contracts for insuring against idiosyncratic risks would become more costly. The central counterparty would also, by definition, be a locus of systemic risk. In the United States, clearinghouses are regulated by the Federal Reserve and the Commodity Futures Trading Commission. For stability purposes they will have to be regulated closely. The question then becomes how to plan for a government rescue of the clearinghouse without distorting the incentives of its operators.

Finally there are questions about the effectiveness of macroprudential oversight. Recall how under the Obama Administration's proposal macroprudential supervision would be the responsibility of a Financial Services Oversight Council chaired by the Treasury while macroprudential regulation of systemically important institutions would be undertaken by the Fed.²⁶ Making macroprudential supervision the responsibility of a council of regulators is a recipe for endless bickering over the existence of risks, the definition of bubbles, and the assignment of responsibilities. When setting guidelines and identifying risks is the responsibility of one entity but enforcing regulations and otherwise intervening in the operations of systemically important institutions is the responsibility of another, can we be confident of adequate coordination?

The alternative of placing both functions within a single institution eliminates this coordination problem but creates other difficulties. Making the central bank the sole macroprudential supervisor and regulator may create a conflict with its price-stability objective and expose it to unwelcome political scrutiny. But assigning those responsibilities to an independent supervisor may limit information flows to and from the central bank and complicate the lender-

of-last-resort function.²⁷ It is not clear that there is a single optimal solution to this assignment problem or even a clear second best.²⁸

2.3. Challenges at the Global Level

In a world in which human and financial capital are mobile, few of these reforms are likely to be feasible and effective without international cooperation.

This has long been recognized in the case of capital adequacy, given the incentive for individual jurisdictions to impose less-demanding requirements in order to attract business. The Basel process was designed to address this problem, but its track record is less than reassuring. The negotiation of Basel II, now shown to have been deeply deficient, occupied the better part of a decade. Given the recent demonstration of the costs of financial instability, it is clear that we cannot wait another decade for Basel III.

What has been done? The Basel Committee has agreed to increase trading book capital requirements to reflect liquidity as well as default risk. It has pledged to submit proposals by the end of 2009 for countercyclical buffers and provisioning over the cycle. The Financial Stability Board has produced recommendations designed to reduce reliance on cyclical value-at-risk-based capital estimates and to supplement risk-based capital requirements with a leverage ratio. The question is whether these limited steps will be enough.

For capital adequacy there at least exists an established process. Negotiating rules for executive compensation will be harder insofar as there is no established international venue. The Financial Stability Board has agreed on principles for the governance of compensation systems, but the mere existence of principles does not guarantee that anything will be done.²⁹ Implementation is by national authorities who will be concerned with brain drain and institutional flight.

One approach would be to proceed under existing corporate governance conventions. Compensation rules are properly the domain of corporate boards and compensation committees. The Organisation for Economic Co-operation and Development (OECD) has promulgated principles for sound corporate governance and consulted with its members and civil society on the role of governance failures in the financial crisis. Unfortunately, aside from monitoring the compliance or otherwise of members, it has no way of enforcing its recommendations.

Similarly, in a world where bank holding companies operate globally, an effective resolution regime cannot be organized at the national level. Host supervisors and creditors may discover that all of a group's liquidity is in another jurisdiction, available first to creditors there. In turn this can alter the

incentives for home regulators to be forthcoming in their interactions with host supervisors.

In the case of nonfinancial firms there has been some progress at harmonizing these arrangements. The International Association of Restructuring, Insolvency & Bankruptcy Professionals (INSOL International), Committee J of the International Bar Association, and the United Nations Commission on International Trade Law (UNCITRAL) all have commissioned working papers, organized meetings, and created working groups to encourage informal cooperation, foster the recognition of foreign insolvency proceedings, and promote model legislation. But the harmonization of special resolution arrangements for financial institutions has lagged.

Only in the EU has there been agreement on the adoption of a uniform insolvency law for banks. The Commission's Directive on the reorganization and winding-up of credit institutions introduced a single entity regime in 2001.³⁰ But even there, difficulties remain. Recall Fortis, the Dutch-Belgian-Luxembourg financial services company hit by the subprime crisis. In the interest of maintaining existing synergies, the Belgian authorities agreed to put up 50 percent of the rescue fund, the Dutch authorities 40 percent, and the Luxembourg authorities 10 percent. But these efforts at cross-border fiscal burden sharing lasted all of a week, after which they collapsed over disputes between the contributors. Rather than saving the baby, the three national authorities chose to dismember it. The Dutch government took 100 percent of the Dutch operations, the Belgian authorities 100 percent of the Belgian operations, and the Luxembourg authorities 100 percent of the Luxembourg operations. So much for synergies. And not even this was straightforward. In June 2009 Fortis Bank Netherlands (owned by the Dutch State) and Fortis Holdings (a Belgian-listed company) ended up in court, litigating which rump unit was responsible for paying preference shareholders.³¹

Turning to securities markets, there is the fact that over-the-counter transactions can migrate. Banning them in one jurisdiction may only cause them to move to another. Even heavier capital requirements for institutions with positions in credit default and interest rate swaps may be ineffective when not all jurisdictions cooperate in applying them. The solution presumably is to incorporate such measures into the revised Basel Capital Accord, though this has yet to be done.

Then there are the questions of where to locate clearinghouses and how to avoid unnecessary proliferation.³² In addition to the two clearinghouses set up in the United States in 2009, five more have been established or proposed in Europe, and it will not be long before more follow in Asia. Netting positive and

negative exposures is difficult if some CDS positions of an individual derivatives dealer are cleared through one clearinghouse while others are cleared through a different clearinghouse.³³ In addition, clearinghouses may be tempted to relax collateral standards and reduce guarantee fund contributions in order to attract business, in which case their stability will be at risk.

One solution is to work on netting across clearinghouses. But this would require strong standardization of contracts and collateral terms—stronger standardization than in current proposals. Another solution would be to agree on the location of one or a small handful of clearinghouses. But not only is this politically difficult, it puts regulation of that global clearinghouse in the hands of a particular set of national authorities who may or may not follow policies congenial to the others.³⁴

Then there is the question of what to do about the rating agencies. In July 2009 the Obama Administration proposed new legislation under which rating agencies would have to register with the SEC and document their internal controls, due diligence, and rating methodologies. The proposed legislation would also prohibit rating agencies from advising clients whose securities they also rate. The EU has agreed to create a college of supervisors for each rating agency and committed to adopting legislation for a single European supervisor for rating agencies by July 2010. That supervisor will presumably demand action limiting conflicts of interest and otherwise ensuring minimally acceptable practices. But even if the EU moves to a single supervisor, the international community will inevitably be left to rely on a college of supervisors, given resistance at the global level to establishing a single supervisor. Whether U.S., European, Asian, Latin American, and other officials can work together to ensure that the rating agencies adopt sound methodologies and avoid conflicts of interest, while at the same time reducing the dependence of the regulatory regime on the ratings they issue, remains to be seen.³⁵

Finally there is the question of how to conduct macroprudential supervision at the international level. Financial institutions and markets are international; so too, therefore, must be the macroprudential response. Here again, Europe epitomizes the challenges, given the deep integration of its financial markets. The Commission has endorsed the recommendations of the de Larosiere Group to establish a European Systemic Risk Council (ESRC) for macroprudential supervision to identify risks, sound warnings, and issue guidelines for corrective action.³⁶ The ESRC will function under the Governing Council of the European System of Central Banks, chaired by the president of the ECB, with the representatives of all 27 EU central banks present along with the presidents of three supervisory bodies: the European Banking Authority, the European

Insurance and Occupational Pensions Authority, and the European Securities and Markets Authority.³⁷

But the ESRC will have no responsibility for regulation, financial supervision, or monetary and fiscal policies, the three key pillars of macroprudential supervision. It will have no ability to change actual policies in these areas, only the ability to communicate its findings to the competent national authorities. As the de Larosiere Report emphasized, binding mechanisms are needed to ensure that the macroprudential findings of these bodies are followed by microprudential supervisors. It is proposed that the ESRC or its constituents could request the Commission to adopt a decision that there has been a “manifest breach” of Community law and thereby require a national supervisory authority to take a specific action in order to come into compliance. In this way the ESRC and the Commission together would have the power to compel corrective action on the part of national authorities—assuming of course that national authorities assign them this power.

What is difficult at the European level is even more difficult globally. The approach that emerged from the G-20 process would put the newly expanded and reconstituted Financial Stability Board in the pilot’s seat, with the IMF as copilot. The FSB will set guidelines for and support the establishment of supervisory colleges for systemically important firms, collaborate with the IMF on early warning exercises, and undertake strategic reviews of the policy work of international standard-setting bodies. It will do so by establishing Standing Committees on Vulnerabilities Assessment, on Regulatory and Supervisory Cooperation, and on Standards Implementation and by expanding its secretariat. As I read it, the idea is that the IMF would report its findings on financial stability risks to the FSB. The FSB would then identify “enhancements” to regulatory frameworks to mitigate risks and communicate these to the relevant national authorities. But it would not have enforcement powers.

Then again, creating a global macroprudential supervisor with enforcement powers may not be as infeasible as commonly believed. Imagine creating a World Financial Organization (WFO) analogous to the already existing World Trade Organization (WTO).³⁸ In the same way that the WTO establishes principles for trade policy (nondiscrimination, reciprocity, transparency, binding and enforceable commitments) without specifying outcomes, the WFO would establish principles for prudential supervision (capital and liquidity requirements, limits on portfolio concentrations and connected lending, and adequacy of risk measurement systems and internal controls) without prescribing the structure of regulation in detail.³⁹ The WFO would define obligations for its members; the latter would be obliged to meet international standards for supervision and

regulation of their financial markets and institutions. Membership would be obligatory for all countries seeking freedom of access to foreign markets for domestically chartered financial institutions. The WFO would appoint independent panels of experts to determine whether countries were in compliance with their obligations. Importantly, it would authorize sanctions against countries that failed to comply. Other members would be within their rights to restrict the ability of banks and nonbank financial institutions chartered in the offending country to do business in their markets. This would provide a real incentive to comply.

It will be objected that national governments will never let an international organization dictate their regulatory policies. The rebuttal is that the WFO would not dictate. The specifics of implementation would be left to the individual country. Members would be able to tailor supervision and regulation to the particulars of their financial markets. But those regulatory specifics would have to comply with the broad principles set down in the WFO charter and associated obligations.

We already do the equivalent for trade. Dispute settlement panels already determine whether, *inter alia*, U.S. tariffs on timber imports from Canada are in compliance with the U.S. WTO obligations. If not, we have the choice of whether to change those laws or face sanctions and retaliation. If the U.S. and other countries accept this in the case of trade, why should they not accept it for finance?

3. Global Imbalances and Global Policy Reforms

The other view of the crisis focuses on global imbalances. The run-up in asset prices and associated financial excesses in this view derived from the combination of accommodative policy in the United States and large capital inflows from emerging Asia and petroleum-producing countries. China's current account surplus rose from less than 2 percent of GDP early in the decade to a whopping 11 percent in 2007. Under other circumstances such large surpluses resulting in foreign-asset accumulation would have led to real exchange rate appreciation through some combination of nominal appreciation and inflation. But China sterilized the asset accumulation, squirreling it in international reserves held largely in U.S. Treasury and agency securities. Moreover, while China's reserves grew rapidly it was not alone; India, South Korea, and Taiwan, among others, also saw very sharp increases in reserves. Oil-exporting countries also ran large current account surpluses and accumulated considerable quantities of reserves after 2000. Russia's reserves rose from negligible levels at the beginning of the decade to nearly \$150 billion at the end of 2007. More generally, there

were large petrodollar flows from the Persian Gulf states, Russia, Nigeria, and Venezuela toward the United States and other advanced country markets.

While China, the rest of emerging Asia, and the oil exporters all had rising national savings after the turn of the century, their national investment rates also rose. But those increases were inadequate to absorb the growing pool of savings. Investment rates in China were in fact extraordinarily high by international standards, and it is not clear that the country could have deepened its capital stock even more rapidly without significant inefficiencies.⁴⁰ Other emerging Asia countries had maintained higher gross investment rates and kept their aggregate current accounts broadly in balance prior to the financial crisis of 1997–98, but some of this investment had been inefficient: it reflected directed-credit policies of governments resisting the inevitable deceleration from the high-growth period and empire building by highly leveraged family-owned conglomerates. These problems were corrected, at least in part, following the crisis. Investment rates in emerging Asia excluding China recovered from their post-crisis lows after the turn of the century but never rescaled the inefficiently high levels of 1993–96. The oil exporters saw modest increases in their investment rates in 2000 and 2006–07, but not on the scale needed to absorb their rapidly deepening pool of saving.⁴¹

All this money had to go somewhere, and much of it flowed to the United States. One estimate (Warnock and Warnock 2006) suggests that U.S. Treasury rates were 100 basis points lower than they would have been in the absence of foreign inflows. The Fed raised short-term rates from 1 to 5.25 percent between mid-2004 and mid-2006, but the yield on 10-year Treasuries actually fell over the period.⁴² This was Chairman Alan Greenspan’s “bond market conundrum,” which his successor and others ascribed to the so-called “global savings glut.” Low real interest rates on 10-year Treasuries pushed capital into other assets. The consequent higher home and stock market valuations had positive wealth effects on spending. Measured household savings in the U.S. fell from approximately 10 percent of disposable income in the first half of the 1980s and 7 percent in the early 1990s to close to zero in 2005–07.⁴³

Spending was further encouraged by U.S. monetary and fiscal policies. While the Fed raised short-term interest rates in 2004–06, it started from exceptionally low levels, reflecting the low rates put in place in response to 9/11 and the 2002–03 deflation scare. It hesitated to normalize too fast for fear of choking off the expansion. The federal funds rate was consistently below Taylor rule levels between 2002 and 2007.⁴⁴ Fiscal policy operated in the same direction. The most reliable way of preventing overheating and discouraging capital inflows is of course by tightening fiscal policy.⁴⁵ And, after a long period of

deficits, net borrowing by the U.S. public sector had actually gone negative in 1998–2000.⁴⁶ But public-sector borrowing resumed in late 2001 with the recession and the George W. Bush Administration tax cuts. Public-sector net borrowing in fact exceeded net borrowing by households in most quarters between the beginning of 2002 and the end of 2007.

The effect of all of this was that the U.S. current account deficit reached 6 percent of GDP in 2006.⁴⁷ Slightly more convoluted is the link to the particular constellation of financial weaknesses that culminated in the crisis. The story as typically told goes like this.⁴⁸ Low yields on 10-year Treasuries encouraged money to flow into higher-yielding assets backed by, *inter alia*, residential mortgages. Mortgage originations as a share of total mortgage debt outstanding thus rose from 6 percent in 1985–2000 to 10 percent in 2001–06. To meet the demand for mortgage-backed securities, lending standards for residential mortgages were relaxed. Agency problems between mortgage brokers who originated the loans, financial institutions who packaged and distributed them, and investors who purchased them allowed this problem to go uncorrected.⁴⁹ The income streams associated with those mortgages were then sliced, diced, repackaged, and insured to render them compatible with the covenants and capital requirements of institutional investors.

A variety of feedbacks amplified these dynamics. Lower lending standards and easy mortgage finance pushed housing prices even higher, which encouraged further reductions in standards by lenders impressed by the increase in the value of real estate collateral. The increase in mortgage activity encouraged entry by brokers and squeezed margins, further aggravating agency problems at origination. Higher asset prices encouraged larger flows into U.S. financial markets from domestic and foreign investors convinced that past performance was a guide to future returns. Higher asset prices also meant more revenues for state and local governments that depend on capital gains and property taxes, respectively, for much of their income; these ramped up their spending accordingly. All these were typical responses to a surge of capital inflows. The only difference from earlier capital flow bonanzas was that this time the country on the receiving end was the United States.

Starting in 2007 these same feedbacks shifted into reverse. Private foreign demand for additional U.S. portfolio investments disappeared in the early part of 2007. The result was a weaker dollar and tighter U.S. financial conditions. U.S. housing prices, having reached historically high levels, had already been in decline since the summer of 2006, causing delinquencies, starting in the sub-prime segment of the market, to rise sharply.⁵⁰ This created problems for debt securities backed by claims on pools of mortgages and, in turn, for institutions

like American Home Mortgage Investment Corporation, BNP Paribas, and Countrywide Credit heavily involved with them. They had to sell other assets in order to square their books, raise liquidity, and meet shareholder redemptions. The more highly leveraged the institution, the more extensive the resulting fire sales. Because the U.S. economy as a whole and its financial sector in particular had become more leveraged during the expansion, deleveraging now was dramatic. Banks, under balance sheet stress and seeing the value of collateral eroding, raised lending standards, putting further downward pressure on housing prices.⁵¹ Private foreign investors who had previously bought U.S. financial assets with wild abandon now withdrew from the market. The story of the crisis can be told more colorfully and in more detail. But from the point of view of our second explanation emphasizing global imbalances, this was the essence of the matter.

3.1. Policy Implications

From this diagnosis again flows a prescription for policy responses. As in the first half of the paper, I highlight six.

First, monetary policy makers must worry about imbalances even in the absence of inflation. The first half of the present decade was notable for the absence of overt inflation in the United States. But even if low interest rates did not spur commodity price inflation, they fed asset price inflation through the various channels enumerated above. They encouraged the financial excesses that set the stage for the crisis. It follows from their commitment to the maintenance of macroeconomic stability that monetary policy makers should lean against unsustainable asset as well as commodity price developments. Regulation alone, no matter how comprehensively reformed, cannot be relied on to prevent unsustainable asset market conditions or to fully contain their consequences. The textbook view of inflation targeting in which asset market developments matter only insofar as they convey information about prospective future commodity price inflation should be abandoned or at least modified to admit an independent role for asset market conditions.

Second, policymakers in the U.S. and elsewhere should attend to the procyclical bias in fiscal policy. The budget deficit and net borrowing by the public sector were allowed to explode in 2003–06 precisely when the U.S. economy was growing strongly and the current account deficit was widening. These were years when the economy did not need a shot in the arm from deficit spending. Fiscal policy makers would have done better to keep their powder dry. Better still would have been to have taken the same advice that they regularly doled out to emerging markets—that tightening fiscal policy is the best way of

moderating the impact of large capital inflows and, indeed, of moderating those inflows themselves.

Third, a large current account deficit cannot be regarded as benign even by a country like the United States that borrows in its own currency. Foreign finance for the current account can dry up abruptly. The U.S. has not felt the full effects this time, foreign central banks having stepped in to replace much of the foreign private investment that evaporated, but it may not be so lucky next time.⁵² A current account deficit that cannot be financed will necessarily be compressed; unlike other deficits, it cannot then be financed at home. Such compression in turn requires a change in relative prices, including in the exchange rate, which can catch investors wrong-footed. It can also precipitate a recession if it takes time to shift resources between the production of nontraded and traded goods. The same arguments leading to the conclusion that monetary and fiscal policy makers cannot afford to disregard asset market developments similarly suggest that they cannot afford to disregard the current account.

Fourth, countries equally cannot regard large current account surpluses with equanimity. If someone else's current account deficit puts financial stability at risk, so too by implication does your surplus, since the former is not possible without the latter. Countries where domestic saving exceeds domestic investment by a large margin have tools with which to boost spending, from increasing public spending directly to easing credit terms for household and corporate spending.

Fifth, relative prices must adjust to accommodate these changes in the pattern of demand. Insofar as the residents of each country exhibit home bias in consumption, the relative price of home goods will have to rise in the surplus country and fall in the deficit country. Ruling out deflation—which policymakers in the deficit country will work hard to avoid—this adjustment will have to occur through some combination of inflation and currency appreciation in the surplus country. For well-known reasons, currency appreciation is the preferable alternative.

Sixth, reserve accumulation will have to be less insofar as surplus countries encourage domestic absorption and see their real exchange rates appreciate in response. Such countries will have to seek other ways of insuring themselves against shocks.

It is worth asking how history would have differed had these recommendations been adopted at the beginning of the decade. U.S. monetary and fiscal policies would have been tighter.⁵³ Chinese and more generally Asian fiscal policies would have been looser. Global imbalances would have been less. Less accommodating monetary policy and less capital inflow would have dampened

financial excesses in the United States.⁵⁴ The combination of less demand stimulus in the United States and more demand stimulus abroad would have left global demand unchanged to a first approximation. To the extent that there were worries about overheating in China and elsewhere, foreign stimulus might not have been increased sufficiently to offset the reduction in demand stimulus in the United States, and the global economy would have grown more slowly. Recall however that global growth in 2005–06 was the fastest in more than 30 years. Slightly slower growth would have been an acceptable price to pay for warding off the most serious financial crisis in generations.

3.2. Challenges at the National Level

Challenges again arise when we attempt to move from principle to practice. It is easy to say that inflation targeting should be modified to admit a role for asset market conditions but harder to know exactly how to modify it. For example, it is easy to assert with benefit of hindsight that monetary policy should have been tightened faster in 2004–06 in response to the rise in housing prices and widening of the current account deficit, but it is more difficult to say by how much. By exactly how much do asset prices and the current account have to move before they justify a monetary policy response over and above that warranted by their implications for expected future inflation and the output gap? The presumption in the debate over whether central banks should target asset market conditions may have tipped away from the Jackson Hole view in favor of the Bank for International Settlements (BIS) view, but earlier questions about the BIS view—starting with how central banks know when asset prices pose a significant threat to stability—have not gone away. If the effect of asset prices on the economy is complex, nonlinear, and contingent, then the monetary policy response to asset price fluctuations will have to be complex, nonlinear, and contingent.⁵⁵ Attempts to routinize monetary policy in the form of a post-Taylor rule are unlikely to succeed.

Similarly, inadequate fiscal restraint in good times is an old problem with no simple solution. Institutional reforms can help, but effective reform will depend on circumstances. In general, fiscal rules that limit deficit spending (but also limit fiscal flexibility) work best where ideological differences between political parties are relatively pronounced, while fiscal procedures that delegate decisionmaking to, *inter alia*, the executive work best where ideological polarization is relatively limited.⁵⁶ In a presidential system like that of the United States, it may be necessary to have both supportive rules and procedures. Given the electoral returns to pork barrel spending it is important to have powerful party leaders and a strong committee system to exercise agenda-setting powers and

discipline members of Congress. At the same time, when the balance of power between the legislative and executive branches is relatively even—also the U.S. case—*ex ante* agreements (balanced budget rules, multiyear fiscal targets) can be critical for fiscal discipline. But reform to give party whips and committee chairs even more power would be strongly resisted. And the unhappy record of the Gramm-Rudman-Hollings balanced budget legislation and its successors does not reassure one about the prospects for binding fiscal rules.

Countries with large current account surpluses may similarly encounter difficulties when attempting to narrow them in short order. In China, significant reductions in household saving rates will require a stronger social safety net, something that cannot be built overnight. Government saving and investment can be adjusted more quickly, but here too there are limits. For example, doubts have been voiced about the efficiency and productivity of the additional investment spending undertaken by China's local governments since the outbreak of the crisis.⁵⁷ Such questions are likely to deter the central authorities from relying yet further on expansionary fiscal policy to address the current account imbalance.

3.3. Challenges at the Global Level

What to do about global imbalances may be the thorniest question of all. In the years leading up to the crisis, both the United States and China followed the policies they did, despite voices warning of risks, because they perceived them as in their self interest.⁵⁸ It could be that they misperceived the balance of risks and rewards and that more effective advice could have alerted them to their error and prompted corrective action. It could be that they failed to understand the impact of their policies on other countries and that more effective consultation would have caused them to recognize the existence of these spillovers and, good global citizens that they are, to internalize them. It could be that there existed policy adjustments that would have been mutually beneficial if taken in tandem even though either would have been welfare-reducing for the country concerned if taken in isolation. It could be, in other words, that what was needed was more effective policy coordination.

The problem is that there already exist mechanisms for correcting these deficiencies. Warning of the risks posed by large current account deficits is at the heart of the International Monetary Fund's (IMF) country surveillance. The Fund issued warnings about the danger that chronic large U.S. current account deficits could result in a disorderly adjustment, but these led to no changes in U.S. policy. It expressed reservations about the constellation of policies that

resulted in large and growing Chinese surpluses but again without noticeable results.

Similarly, the IMF's multilateral surveillance is designed to alert countries to the spillovers and external effects of their policies. Instruments here include the IMF's two flagship reports, the *World Economic Outlook (WEO)* and *Global Financial Stability Report*, its *Regional Outlooks*, its contributions to interregional committees and forums (the G-7/8, G-10, G-20 etc.), and confidential briefings on internal evaluations like those undertaken by the Coordinating Group on Exchange Rate Issues. The spring and autumn 2005 WEOs devoted considerable space to the factors underlying global imbalances, the risks, and the appropriate policy response, again without discernible results.

Since 2006 the IMF's arsenal has included a Multilateral Consultations Initiative bringing together a small number of countries for whom such spillovers are first order. The first such consultation, announced in June 2006 and concluded with an Executive Board discussion in July 2007 (note the date), brought together the United States, China, Japan, the euro area, and Saudi Arabia to discuss the cross-border impacts of global imbalances. This consultation started with bilateral staff visits with the five participants followed by multilateral meetings and a joint report. The report mentioned how the process had been "useful" and how it had "contributed to an improved understanding of the issues and each other's positions."⁵⁹ Again, however, it is hard to see that this useful initiative and improved understanding led to significant adjustments in the policies of the countries in question.

Finally, if the problem is to coordinate policy adjustments that are unappealing in isolation but mutually beneficial if undertaken jointly, then there already are mechanisms for achieving this. There is the aforementioned Multilateral Consultations Initiative. There are country groupings ranging from the G-7/8 to the G-20. There are bilateral consultations among governments such as the annual U.S.-China Strategic Dialogue. If there is a shortage of coordinated action, it is not for a shortage of venues for coordination.

Why these processes did not lead to different outcomes is familiar enough. While the IMF can issue warnings, it cannot compel policy adjustments by countries that do not borrow from it, either because they have no difficulty borrowing on the market (the U.S. case in the period leading up to the crisis) or because on net they do not borrow at all (the Chinese case). Louder warnings might be more likely to elicit action, but these would be problematic on a number of grounds. IMF staff and management operate under the oversight of the Executive Board, which speaks for the governments about whose policies they are warning. Large shareholders could push back against warnings that cause

them significant embarrassment, through actions in the Board that make management's position untenable. Staff and management know this and choose their language accordingly.

Likewise, the notion that good global citizens should internalize the cross-border spillovers of their policies and that difficult policy adjustments may be easier when coordinated internationally runs up against domestic political constraints. The multilateral consultation on global imbalances resulted in statements by the United States that it would pursue fiscal consolidation and from China that it would encourage domestic spending. But for the U.S., meaningful fiscal consolidation would have meant tax increases, which were a nonstarter politically. For China, ramping up domestic spending more rapidly (which, in practice, would have meant ramping up public spending) would have meant ramping down something else given that the economy was operating close to capacity. That something else would have been exports, which would have antagonized politically influential export interests.⁶⁰ For other Asian countries, it would have meant forgoing the reserve accumulation seen as the first line of defense against financial instability.

The familiar responses to these problems go as follows. The IMF needs to devote more resources to surveillance—and so it has gone on a hiring binge since the crisis. It needs to develop better early warning indicators—notwithstanding the fundamental difficulties of crisis prediction and the failure of all concerned to predict the last one.⁶¹ Governments should take the results of such surveillance and early-warning exercises more seriously—despite their manifest reluctance to do so over the years. They should behave more cooperatively.

In addition to relying on clearer crystal balls and better behavior, it might be worthwhile to think about more ambitious reforms. None of the initiatives I am about to describe will happen overnight. The political obstacles are formidable. But if one takes seriously the risks posed by global imbalances, they are worth contemplating.

One option would be to strengthen IMF surveillance by giving greater independence to those vested with the surveillance function. The IMF department responsible for surveillance would function independently of management and the Board. Firewalls would separate surveillance from other IMF functions like emergency lending. The surveillance unit would have its own budget. It would be overseen by a director appointed to a single long term in office. It could issue reports without the prior approval of management or the Board. It would be able to call a spade a spade. The IMF has adopted this kind of structure for its Independent Evaluation Office (IEO), which is independent of management,

operates at arm's length from the Board, and is overseen by a director serving a single six-year term. The U.K. government in 2003 proposed this kind of structure for the surveillance function.⁶²

But what we have learned about the effectiveness of Chinese walls in other financial institutions gives grounds for questioning whether they would be effective in this context. Staff will be moving back and forth between the surveillance unit and other departments.⁶³ Can they really be expected to ignore the preferences of management and the Board? Can they really be expected to disregard the ability of management and the Board to shape their career prospects in other departments? The crisis has also alerted us to the kind of problems that arise when the monitoring function is allocated to one entity and the lending function to another.⁶⁴ Effective firewalls and seamless information sharing do not go hand in hand.

A stronger alternative to imagining that a unit within the IMF can be made more independent is to make the entire institution more independent.⁶⁵ Members of the management team would serve long terms. They would not have to seek the approval of an Executive Board of political appointees. They could issue strong surveillance statements. At the same time, surveillance could be adequately coordinated with other functions. An independent management team could react quickly to the events, in the manner of national central banks. They could adopt innovative tactics and instruments, much like central banks in the recent crisis.

For such strong independence to be acceptable, management would have to be strongly accountable for their actions. They would have to be more transparent about their decisions and their criteria for taking them. One could imagine publication of minutes of their deliberations.⁶⁶ One can imagine the managing director holding press conferences summarizing the management team's decisions, much like the president of the ECB.

Management would have to be strongly accountable to the International Monetary and Financial Committee (IMFC), the oversight committee of 24 officials whose composition mirrors that of the Executive Board. Much as the president and monetary policy committee of a central bank are accountable to their national parliament or congress, IMF management would have to justify their actions to the IMFC. They should be subject to a formal vote of no confidence. The IMFC, for its part, would be accountable to the Board of Governors of the IMF. The IMFC would have to be reconstituted as the IMF Council, as provided for under the Articles of Agreement, so that what are now recommendations become binding instructions to management.

It would of course be necessary to abolish the convention that the managing director should be a European and his first deputy an American. Leadership selection would have to reward the most qualified candidates.⁶⁷ It would be necessary to devise a selection mechanism for the entire management team that both picked out high-quality candidates and ensured a reasonable degree of geographic and economic diversity.

For some, delegating these sensitive functions to independent technocrats would be a bridge too far.⁶⁸ If so, the alternative to delegation is rules. The other way of insulating surveillance from politics, in other words, is by mechanizing it. If chronic surpluses and deficits pose a threat to systemic stability, then another way of applying stronger pressure to correct them would be by automatically levying penalties on the countries running them.⁶⁹ A country that had run a current account surplus or deficit in excess of 3 percent of GDP for three years, for example, might be required to transfer resources to the Fund at the end of every year in which that excess persisted.⁷⁰ The transfer might equal one-half of the current account balance in excess of 3 percent of GDP.⁷¹ Nothing would prevent countries from running large and persistent external surpluses and deficits if they found it difficult and costly to adjust saving and investment, but their doing so would entail an additional cost, in turn ratcheting up the pressure to adopt policies of adjustment.⁷² This tax could be written into the Articles of Agreement so that collecting it would not require, *inter alia*, a decision by the Executive Board.⁷³

A problem with a symmetrical scheme of this sort is that deficit countries may lack resources to transfer to the Fund. They will be losing reserves rather than gaining them. But they will be subject to market discipline. The same is not true of surplus countries that feel no direct pressure from the market to adjust. This asymmetry was what motivated the decision to include a scarce currency clause in the IMF's original Articles of Agreement so that other countries could apply pressure for chronic surplus countries to adjust. If the present measure were applied to surplus countries alone, it could be thought of as a price-based scarce currency clause.

To the extent that surplus countries are motivated by the desire to accumulate reserves, a tax requiring them to transfer dollars or the equivalent to the IMF could conceivably have the perverse effect of encouraging them to undervalue their currencies still more so that they could replace the reserves that they had been forced by the provision to transfer to the Fund. In other words, the tax would have a relative price effect and an income effect working in opposite directions.⁷⁴ Thus, marrying the current measure to other sources of emergency liquidity besides own reserves would make it more effective. More

generally, global reforms enhancing those other sources would mitigate the tendency for countries to run chronic surpluses.

The most obvious source of emergency liquidity is, of course, the IMF itself. The Fund's original *raison d'être* was to act as a reserve pooling arrangement. It has recently received a considerable increase in the resources that it can deploy in emergency lending. It has streamlined its procedures for deploying them.⁷⁵ It has established a Short-Term Liquidity Facility for making substantial loans of reserves without conditions to countries with strong policies. Quota reform has begun to better align voice in the institution with 21st century realities. Yet no Asian country has requested eligibility for the Short-Term Liquidity Facility. Other conference participants will have to explain what further reforms would make it politically acceptable for an Asian government to again borrow from the IMF.

The alternative is regional reserve pooling. Different countries being hit by shocks at different times, the timing of reserve needs will differ as well.⁷⁶ The same quantity of reserves can go further if pooled, and effective pooling will reduce the pressure to run large surpluses in order to accumulate more. It will also minimize the other costs of reserve accumulation which range from the risk of capital losses on foreign currency holdings to forgoing higher levels of consumption and investment.

The Chiang Mai Initiative, now the Chiang Mai Initiative Multilateralization Agreement (CMIM), is the most highly developed example. In May 2009 ASEAN+3 finance ministers agreed to transform their \$120 billion of bilateral swaps and credits into a reserve pool. Operational decisions will be by simple majority, where countries will have votes roughly in proportion to their contributions. China and Japan will both contribute 32 percent, Korea 16 percent, ASEAN the remainder. The agreement also included a commitment to establish a regional surveillance unit, although there is no consensus on where to situate it or how to staff it.

But disbursing more than 20 percent of the credits available to a country still requires that it reach an agreement with the IMF; 20 percent of a country's entitlement is actually less than it contributes to the pool. This nullifies the purpose of the arrangement, which is to provide an alternative to the IMF. While there is a plan to first raise and then eliminate the 20 percent threshold, this is left for some unspecified date.

The reason is straightforward. Countries want assurances that their resources will not be used frivolously. They want to know that they will be repaid. But regional neighbors find it hard to criticize one another's policies and demand adjustment. Political sensitivities run high in Asia. But even in Europe,

with its long history of cooperation, surveillance and conditionality are outsourced to the IMF. Revealingly, the Fund and not the EU has taken the lead in negotiating emergency assistance packages for Hungary and Latvia.

Delinking the CMIM from the IMF will require Asian countries to undertake hard-hitting reviews and demand difficult policy adjustments. One solution, again, would be to give both surveillance responsibilities and the actual power to disburse funds to an independent board. Its members, enjoying statutory independence and long terms in office, could function like the monetary policy committee of a central bank. They could issue a Financial Stability Report that bluntly flags weak policies and vulnerabilities. And they could demand policy adjustments as a condition for disbursing funds. The CMIM could then be delinked from the IMF.

Then there are a variety of proposals for reforming the international monetary system. The current system already includes the one feature that is most useful for correcting imbalances, namely exchange rate flexibility. This permits surplus countries increasing spending to raise the relative price of locally produced goods without suffering inflation and deficit countries doing the opposite to avoid significant deflation. It is all to the good that we are unlikely to see changes in this exchange rate system as a result of the crisis.

The other relevant aspect of the international monetary system is the supply of international reserves. Here one encounters a variety of proposals for replacing the dollar with another unit. These are based on the argument that allowing a national currency to constitute the dominant share of international reserves requires the country issuing it to run the current account deficits that are at the root of the imbalances problem.⁷⁷ It is important to understand that the “requires” part does not follow. To see this, observe that the euro has gained ground as a reserve currency even though the euro area has not run significant current account deficits in recent years. Or recall that countries accumulated dollar reserves under the original Bretton Woods system even though the U.S. had a balanced current account and even substantial surpluses for the vast majority of the period. All that is required is that the reserve-currency country running the balanced current account should invest abroad at least in an amount equal to the incremental demand for reserves in the rest of the world.

Hence the argument that being the sole supplier of reserves creates a tendency for a country to run chronic deficits must be a different one. It must be that the desire of other countries to accumulate reserves reduces the *incentive* for the reserve issuer to run a balanced current account. Knowing that other countries demand additional reserves and will willingly finance the reserve

center's current account deficit, policymakers in the reserve-issuing country must have less incentive to adopt painful policies that raise national savings to the level of national investment.⁷⁸ Think of it as a problem of moral hazard.

To the extent that this moral hazard is present, the question is what to do about it. One idea is ongoing issuance of Special Drawing Rights (SDRs) to provide a nonnational source of incremental reserves. The IMF would issue SDRs on a regular basis in amounts equal to the increase in global reserve demand. The problem here is that SDRs can be used only for transactions with the IMF and among consenting governments. Unlike national currencies they cannot be used for foreign exchange market intervention and other transactions with market participants. For central banks and governments that see reserves as insurance—that anticipate actually having to use them—this illiquidity renders SDRs unattractive.⁷⁹

Making SDRs attractive would require making them liquid. This would mean developing private markets on which SDR claims can be bought and sold. It would be necessary to build broad and liquid markets on which governments and, for that matter, financial and nonfinancial firms can issue SDR bonds at a competitive cost. Banks would have to find it attractive to accept SDR-denominated deposits and extend SDR-denominated loans. The pension funds and insurance companies that are the dominant sources of private demand for bonds would have to be attracted to holding bonds denominated in a basket of currencies despite the fact that their liabilities tend to be dominated in a single national currency.⁸⁰ It would be necessary to restructure foreign exchange markets so that traders seeking to buy, say, Korean won for Thai baht first sold baht for SDRs (before buying won) rather than first selling baht for dollars. While all this is possible, it would not be easy. It is worth recalling that there was a previous attempt to commercialize the SDR in the 1970s that never really got off the ground. Succeeding this time would take decades rather than years.⁸¹ We can discuss it at the San Francisco Fed's 10th biennial Asia-U.S. conference.

As part of this effort, the IMF would have to be authorized to issue additional SDRs in periods of shortage, much as the Fed provided dollar swaps to provide dollar liquidity in the second half of 2008. At the moment countries holding 85 percent of IMF voting power must agree before SDRs can be issued, which is not exactly a recipe for quick action. IMF management would have to be empowered to decide on emergency SDR issuance just as the Federal Reserve can decide to offer emergency currency swaps. For the SDR to become a true international currency, in other words, the IMF would have to become more like an independent global central bank. The idea of an independent IMF

has its advocates, as I have made clear above, but it is not clear that China, Russia, Brazil and other advocates of replacing the dollar with the SDR are aware that this is the implication of their proposal.

The other approach to reducing the dominance of the dollar would be to diversify the sources of international reserves. The moral hazard felt by any one nation's policymakers would then be limited. Imagine 20 years from now, three economies of roughly comparable size, each with a convertible currency traded on liquid markets that can be used to satisfy the incremental demand for reserves. No one of them will be able to reduce its saving relative to its investment by a substantial margin simply because the global demand for reserves is growing. One way of understanding how global imbalances grew so pronounced in recent years is that the incremental demand for reserves was increasingly large while the share of the reserve-issuing country in the global economy was unusually small. So it was that the United States came to account for some 75 percent of global current account deficits. With the U.S., the euro area and China all issuing reserves (to reveal the identities of my three plausible candidates for reserve center status 20 years from now), such imbalances would be less. Given the existence of alternatives, an issuer prone to excessive deficits would quickly see other countries accumulating reserves in currencies other than its own. That, in turn, would be a source of external discipline.

This, I have argued elsewhere, is the direction we are heading.⁸² The euro's share of global reserves has risen since the new European currency was created in 1999. And Chinese officials have clearly mounted a campaign to transform the renminbi into an international currency, encouraging domestic and foreign firms to settle their transactions in renminbi, signing agreements with foreign governments to do likewise, extending renminbi swaps to foreign central banks, and relaxing restrictions on the ability of foreign financial institutions to issue renminbi debt in Hong Kong.

But again, the euro and the renminbi will match the dollar as an attractive form of reserves only when they possess equally deep and liquid markets. The market in U.S. Treasury debt remains far and away the most liquid in the world. Europe and China may eventually succeed in creating equally liquid markets in debt securities denominated in their currencies, but the relevant time frame is measured in decades, not years. Europe's problem is that the stock of government debt securities is not homogeneous. Different government bonds differ in their risk, returns, and liquidity. German bunds have a reputation for stability, but since they tend to be held to maturity by institutional investors, the market in them lacks liquidity. Other euro-area countries with plenty of bonds have deep financial problems as a result of past policies and the crisis. Italian

government bonds are in fact the most important euro-area debt securities by value, but the country's problems mean that they are not attractive as reserve assets. The crisis has encouraged talk of issuing euro-area bonds and putting the full faith and credit of the entire set of members, starting with Germany, behind them. Were this done on a significant scale and were such debt to replace the national debt securities of the member states, the euro area would possess something more closely resembling the U.S. Treasury market.

For the renminbi, an important precondition is full capital account convertibility, and even that is only necessary, not sufficient, for market liquidity. Chinese officials have targeted 2020 as the date by which Shanghai should be transformed into an international financial center, meaning that its markets are open to foreign investors free of capital account restrictions. At that point the process of building truly liquid markets can commence.

Someday we will have a multiple reserve-currency system not unlike the one that existed before 1913 that limits the problem of global imbalances. But not tomorrow.

4. Conclusion

Financial crises are complex. Our recent crisis is one such complex event whose causes can be broadly grouped under two headings: lax regulation combined with skewed incentives in financial markets, and accommodating monetary policy combined with global imbalances that fueled an unsustainable housing and credit boom.

That crises rarely have a single cause means that avoiding them can rarely be achieved by a single policy reform or set of reforms. This paper has therefore provided two lists of reforms designed to address the two sources of instability contributing to our recent crisis. Both lists are long. Neither will be easy to implement. In both cases powerful stakeholders will resist reform. In both cases important details remain to be worked out. In both cases the extent of intellectual agreement on what must be done may be less deep and broad than I have made out in this paper.

Be that as it may, now that the worst of the crisis has passed it is important that the sense of urgency attached to reform, and the willingness to collaborate internationally in its pursuit, not also be allowed to pass.

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NOTES

1 For my views on this question see Eichengreen (2009a).

2 Given this litany of incentive problems, it is not hard to see how the world fell prey to a financial crisis. In retrospect the more appropriate question would seem to be, how could it have avoided one given these conditions? All this might seem blindingly obvious in retrospect. What is less obvious is why these problems were so inadequately appreciated before the fact. The failure of financial market participants to sound alarm bells is perhaps understandable, given that they were able to profit handsomely from exploiting incentives for risk-taking and, in the words of Chuck Prince, to keep dancing so long as the music is playing. The failure of the regulators to do more plausibly reflects intellectual regulatory capture—the tendency for regulators to buy into the world view of the regulated. For my money, the most troubling aspect is the failure of independent observers—including academics—to appreciate the prospective risks (Eichengreen 2009b).

3 As Spanish regulators insisted prior to the crisis.

4 Thus, capital requirements for asset-backed securities have been predicated on the assumption of a 10-day trading horizon, which is patently unrealistic in many cases.

5 At least if someone stands behind their warranties.

6 The Federal Deposit Insurance Act allows the FDIC, when resolving a bank, to transfer certain derivatives and other qualified financial contracts to third parties, eliminating this problem. But not so the U.S. Bankruptcy Code to which nondepository institutions are putatively subject. For more on this, see the immediately following paragraph.

7 The Fed does have the power to require a bank holding company to divest its banks if it fails to meet minimum capital requirements, although the holding company normally has 180 days to complete the divestiture (Elliot 2009).

8 The U.S. Treasury has proposed extending FDI-like resolution authority to bank holding companies and their subsidiaries but not to hedge funds, private equity firms, and other non-holding company financial entities. Seizing, restructuring and reprivatizing a large bank holding company either as a unified whole or in parts is likely to be more complex than doing so for a depository institution, not just since bank holding companies are more complex but because each one is unique. Banks should therefore be required to provide a roadmap for how this can be done. Anil Kashyap (2009), the Bank of England (2009), and the Committee on Capital Markets Regulation (2009) all suggest that bank holding companies should be required to plan their own funeral arrangements in advance; they should be required to draft a set of instructions for how their institutions could be quickly dismantled

should the need arise. Providing regulators with a roadmap would give them an alternative to bailouts. Reducing bailout incidence would in turn mitigate moral hazard. In addition, having to sign off on their own funeral arrangements would focus the attention of managers and directors on the mortality of their institution. It would deter them from taking on additional risks that made orderly unwinding more difficult—especially if banks whose own plans indicated that more days would be required for orderly resolution were required to hold commensurately more capital.

9 More detailed discussion is in Cohen and Goldstein (2009).

10 It means compensating their staffs appropriately. The problem of bloodhounds and greyhounds is a perennial: the greyhounds (financial market participants) run very fast while the bloodhounds (their regulators) struggle to stay on the trail. But a starvation diet does not help the bloodhounds keep pace.

11 Confidentiality should be ensured, but this should not be something to lose sleep over insofar as reporting will be to the regulators, who can aggregate the information before releasing it.

12 See U.S. Treasury (2009a).

13 Committee on Capital Markets Regulation (2009), p. 22.

14 Related to the preceding, the authorities should encourage standardized derivative instruments that lend themselves to centralized clearing and exchange-based trading. Bespoke instruments, being one of a kind, are necessarily bought and sold over the counter. Banning such instruments, which would deny issuers the ability to ensure themselves against idiosyncratic risks, might be a bridge too far. But the associated externality—that securities traded over the counter pose greater risks to systemic stability—should be internalized by holding investors in such instruments to higher capital charges.

15 This problem of compensation practices points to larger problems with the corporate governance of large financial institutions. Fixing these problems is not straightforward: strengthening the fiduciary responsibility of directors would more effectively incentivize existing board members but discourage qualified individuals from serving. One desirable reform would be more independence for the risk management function. The chief risk officer should be required to report directly to the board of directors as opposed to the CEO, and his compensation should be tied to the stability of the firm and not simply its profits. Buiter (2009) recommends subjecting all new board members to a written test, set by the regulator and marked by independent experts, on the products, services, and instruments traded and managed by their financial institutions, to guard against the danger that directors are inadequately knowledgeable of the business they oversee.

16 The latter being known, for present purposes, as microprudential supervision.

17 More on this below.

18 Avinash Persaud (2009) has suggested relating capital requirements to cross-institution correlations (whether a bank holds the same assets as other banks and may be inclined or forced to sell them at the same time, posing a threat to the stability of the system). Do regulators in fact know how to implement such a complex capital adequacy regime? The U.S. Treasury evidently proposes to place financial institutions into a couple of categories by

size and connectedness, requiring so-called Tier 1 financial institutions to hold more capital (U.S. Treasury 2009b); in principle one would want a more nuanced categorization.

19 By way of example, these questions are all implicit in U.S. Treasury Secretary Timothy Geithner's statement of principles for reforming the capital adequacy regime in the United States and globally (U.S. Treasury 2009b), but they remain unanswered.

20 There is also an issue of fairness insofar as bondholders purchased the bonds of bank holding companies in the expectation that they would be protected by the provisions of the currently applicable bankruptcy code.

21 My own answer is "all of the above" if they are systemically significant.

22 This problem could in principle be solved by establishing a single consolidated regulator, but in the U.S. at least this does not appear to be in the cards. The Obama Administration's White Paper (U.S. Treasury 2009a) would have the Treasury Department invoke this authority after consulting with the President and the relevant regulators. Cohen and Goldstein (2009) recommend that the decision to activate should be vested in the Treasury on the written recommendation of two-thirds of the members of the Federal Reserve and FDIC boards.

23 Some hedge funds are already required to register with the SEC. The existing loophole is for private advisors with fewer than 15 investors that do not proffer general investment advice. But these existing registration requirements do not come with reporting requirements.

24 And for hedge funds that churn their portfolios rapidly, it may be positively misleading. Whether it is possible for hedge funds to provide and regulators to process in real time information on funds' portfolios, as advocated by Blinder (2009) and Calomiris (2009), is an open question.

25 If so the appropriate response would be still higher capital requirements. This might make securitization more costly, but so be it.

26 In the U.K. there is a similar debate over where to place ultimate responsibility for macroprudential supervision, with the Financial Services Authority (the preference of the current Labour Government) or the Bank of England (as proposed by the shadow finance minister of the Conservative opposition).

27 As arguably happened in the U.K. in the case of Northern Rock.

28 The author, for what it is worth, inclines in the direction of making the central bank the consolidated macroprudential supervisor, notwithstanding the associated conflicts and unwanted political attention.

29 See Financial Stability Forum (2009).

30 See Tucker (2009).

31 In a dispute that looks like it will take several years to resolve.

32 For more on these issues see Duffie (2009).

33 They are inefficient if different derivatives (credit default swaps, interest rate swaps) cleared through separate clearinghouses.

34 Still another idea would be for national authorities to agree on a single clearinghouse to be operated and backstopped by a multilateral organization such as the IMF. But this would be a radical departure for what is a fundamentally monetary institution. And it would entail ceding significant national prerogatives to an international organization.

35 While the Financial Stability Forum analyzed the role of the rating agencies in a 2008 report (FSF 2008), it did not recommend moving toward a new regulatory regime. This is not promising.

36 On the report of the de Larosiere Group, see de Larosiere et al. (2009).

37 There would seem to be heavy overrepresentation of central bankers and underrepresentation of supervisors on the risk council. But it is not clear how to fix this given the presence of 50 some supervisors in the EU. A further problem is that the lines between insurance, pensions, and securities are blurring. Goodhart and Schoemaker (2009) suggest moving directly to two institutions, one for banking and one for securities markets. But then there would be even heavier numerical overrepresentation of central bankers.

38 I have proposed this in Eichengreen (2009c), from which the next couple of paragraphs are drawn.

39 The Basel Core Principles for Effective Banking Supervision would be the obvious place to start when defining these principles.

40 In a sense, the 2008–09 fiscal stimulus, a considerable fraction of which was devoted to additional investment, will provide a test of the hypothesis.

41 In the Bretton Woods II view, China's investment in U.S. Treasury and agency securities reflected the inefficiency of its financial system: the Chinese authorities invested (on behalf of their residents) in U.S. financial assets, and U.S. financial institutions used the resulting liquidity and their superior investment expertise to channel resources to U.S. corporations, which invested directly in China (see Dooley and Garber 2005). The flaw in this view was always that FDI into China plus domestically financed investment fell short of Chinese savings. In other words, there did not exist profitable investment opportunities sufficient to absorb the pool of Chinese savings, regardless of who did the intermediation. The flaw in the Bretton Woods II story, in other words, is that while it could explain the two-way flow of capital it could not explain the current account imbalance.

42 From 4.7 to 4.5 percent.

43 The ratio of total household debt to disposable income rose meanwhile from 80 percent in the 1990s to nearly 135 percent in 2007. It was also argued at the time that increased consumer spending reflected the belief that productivity growth had accelerated permanently—that household debt could rise now because of expectations of increased disposable income in the future. The problem with this argument is that it doesn't explain why U.S. households chose to leverage in response but the U.S. corporate sector did not, since higher expected future incomes for households should have had as their counterparts higher expected future revenues for firms, which would have encouraged them to assume higher debt ratios, which they did not.

44 See Taylor (2009).

45 This is the advice that the U.S. Treasury, among others, has regularly given emerging markets over the years.

46 Recall contemporary fears of a shortage of marketable U.S. Treasury securities and questions, which now seem quaint, about how monetary policy might be conducted in their absence.

47 Note that the U.S. was not alone in seeing its current account deficit widen: similar trends were evident in, *inter alia*, Australia, New Zealand, the U.K., and Spain, among others.

48 My favorite rendition is Goldman Sachs (2009).

49 Or at least to remain uncorrected.

50 The peak in housing prices was already in 2005 according to the Case-Shiller 10-city index.

51 And on economic activity generally.

52 Nor may other countries.

53 My friends at the Fed will no doubt object that a tighter monetary policy in 2002–03 would have exposed the U.S. economy to very serious danger of deflation. Perhaps, but this does nothing to weaken the argument that monetary policy should have been tightened more aggressively starting in 2004 in response to the housing bubble and other evidence of financial excesses—more so insofar as fiscal and regulatory policies were not doing their parts.

54 This, recall, is the premise of the second half of the paper.

55 A point that is not original to me; see for example Visco (2009).

56 See Hallerberg, Strauch, and von Hagen (2009).

57 See Shih (2009).

58 Here “China” is shorthand for surplus countries generally. “The United States” is, similarly, a stand-in for deficit countries generally, although the fact that the United States accounted for the vast majority of global current account deficits in the years leading up to the crisis means that this shorthand does little violence to the facts.

59 The quotes are from the Public Information Notice summarizing the Executive Board discussion (IMF 2007).

60 This adjustment to prevent the economy from overheating would have been achieved by allowing the currency to appreciate. Of course, there was no such currency adjustment after November 2008 when Chinese public spending was ramped up, but then there was no longer a danger of the economy overheating, export demand having collapsed. And given that increased public spending no longer threatened to crowd out exports, given that growth had slowed relative to capacity, opposition to increased public expenditure was less.

61 My favorite statement of the limitations of such early warning exercises is Eichengreen and Rose (1999). A recent analysis attempting to predict the incidence of the 2008–09 crisis and link it to causes—reaching essentially the same conclusion—is Rose and Spiegel (2009).

62 See Balls (2003).

63 Certainly this is the case if the experience of the IEO is any guide.

64 Can you say “Northern Rock?”

65 I will be excused, I hope, for repeating this argument, having made it now for fully a decade. See DeGregorio et al. 1999. The excuse for repeating it is that the case is, if anything, stronger than ever in the wake of the crisis. I argue this in Eichengreen (2009c), from where this paper’s material on this subject is drawn.

66 In the manner of the Fed. This would be a small step technically, since minutes of board meetings are already kept and a highly sanitized version is published as the conclusions of the chair.

67 As G-20 finance ministers reportedly agreed at their mid-March 2009 meeting in Sussex, England.

68 The objection to schemes of this sort is that the decisions of the IMF are more complex and therefore entail more discretion than those of a central bank and that they require the Fund to put taxpayer money more directly at risk. Since a central bank just sets interest rates rather than applying detailed prescriptions for changes in the fabric of social and economic policy, it is said, independence for its monetary policy committee is politically tolerable. Since it just sets interest rates, an action which is easily monitored and assessed, holding its independent management accountable for their actions is relatively straightforward. And since central banks accept only high-quality collateral in their lending operations, they do not put serious taxpayer money at risk (typically, in contrast, they are a profit center). In the wake of the crisis it is clear that none of these objections hold water. We have seen national central banks engage in very detailed interventions in financial and other markets. They have purchased all manner of collateral as required by policies of credit easing, exposing themselves to significant balance sheet losses. The reality is that modern central banks, not unlike the IMF, are required to do much more than just set interest rates. This has created some discomfort among observers and demands that central bankers do a better job at justifying their actions; it has similarly created pressure that mechanisms for holding them accountable, be these oversight committees of or appointed by the U.S. Congress or the relevant committees of the European Parliament, be strengthened. Ron Paul notwithstanding, it has not given rise to the view that central bank independence is intolerable or, for that matter, undesirable.

69 I made this case for chronic surplus countries in Eichengreen (2009c); here I generalize the argument to deficit countries.

70 The particular thresholds mentioned in the text are purely illustrative; readers are free to substitute their own. Note that nothing requires that the tax revenues be paid in to the Fund. They equally well might go to the World Bank for development assistance or the United Nations for peacekeeping operations.

71 Or the charge might initially be set at a lower level and raised to, say, 50 percent over time (as members who wished to minimize it had more time to adjust). More recently Prasad (2009) has suggested that such a tax might be applied to countries’ holdings of Special Drawing Rights (SDRs) at the IMF and would be levied if a country failed to hit its target for its current account (and fiscal) balance over a three-year horizon.

72 Economists not liking tax schedules with discontinuities, one can imagine a tax on all increases in foreign reserves that started at infinitesimal levels but rose fairly quickly as the increase in reserves rose as a share of GDP and as a function of its persistence.

73 It would presumably be easiest to implement in a period when it was not so obvious on which members it would predominantly fall.

74 The desire to accumulate reserves is only one reason, of course, why some countries are inclined to maintain highly competitive real exchange rates and run chronic external surpluses. Rodrik (2008) argues for example that so-called undervalued exchange rates are associated with rapid economic growth because they encourage manufacturing employment. To the extent that these other motives prevailed, the perverse “income effect” would not dominate.

75 I cannot resist observing that an independent IMF could react to events even more quickly.

76 Insofar as shocks have a strong regional component—different countries in a region tend to suffer them at the same time—regional reserve pooling is second best to global reserve pooling. On the regional dimension of crises see Glick and Rose (1998).

77 There are also other arguments, such as the desirability of substituting another unit, say the SDR, for existing dollar holdings to relieve reserve holders of the risk of capital losses on those existing dollar balances. This is the idea of creating a new “substitution account.” I do not consider this here (except in a later footnote) for reasons of space and because it is concerned with the financial legacy of past imbalances rather than the question of how to prevent future imbalances.

78 This is a conceivable result, although not a necessary one. Still, it is not implausible that this was part of the explanation for the imbalances problem of recent years. In other words, there is a high probability that the United States would have adopted policies more closely equalizing the country’s saving and investment—or that the market would have brought about this result through a decline in the dollar—had there not existed a strong central bank demand for dollar reserves.

79 Just why Chinese, Russian, and Brazilian officials have been pushing the SDR option is an interesting question. It could be that they see it as a stalking horse for a substitution account—as a way of getting existing dollar balances off their balance sheets as opposed to an alternative for accumulating future reserves. It could be that they see this as a way of demonstrating their desire to be players in discussions of international monetary reform. Conference participants may have a better answer to this question than I.

80 They could swap out the currency risk, but this would be an additional cost of the investment strategy, which would presumably render it unattractive—or require an interest-rate premium of the issuer, which would make issuance less attractive.

81 The current crisis itself is a reminder that building liquid markets in a new, novel asset is not something that occurs overnight.

82 See Eichengreen (2009d).

COMMENTARY

The Financial Crisis and Global Policy Reforms

Anil K. Kashyap

Barry Eichengreen's paper pushed me to take a different look at the crisis and I encourage everyone to read the paper carefully.

I will separate these very brief remarks into three parts. First, I will review his basic observations, concentrating on what I see as his more novel points. Next I will present one picture that informs my thinking on the role of global imbalances in the crisis. Finally, I will extend some of his discussion on incentives that I believe are important for the next steps in regulatory reform.

1. Incentives vs. Global Imbalances

The paper lays out two very different descriptions of the driving factors in the crisis. Depending on one's background, parts of each account are likely to be familiar, but other parts will probably be new. One of the nice aspects of the paper is that it offers a concise but thoughtful account of each perspective. Another novel aspect of the paper is the very appropriate attention to the global policy challenges that lie ahead.

The first view, which I would dub the orthodox, financial economist's account of the crisis, focuses mostly on the problems with "incentives." Incentives here relate to motivating considerations of both regulators and market participants. The main idea is the managers and owners of financial institutions received rewards for investments, loans, and other actions that may not be in society's interest. Unfortunately regulators did not necessarily have the tools or incentives to combat some of the problems that arose.

This view leads to most of the now standard list of prescriptions for regulatory reform. The standard list of candidate reforms includes strengthening capital regulation to require banks to hold more capital; changing the regulations that govern the resolution of an impaired institution; mandating

Author's Note: *These views are entirely my own and should not be interpreted as reflecting any of the organizations with which I am affiliated.*

better disclosure of information to bank regulators; reforming the structure of derivatives contracts to make them less disruptive in the event of bankruptcy; restricting the form of compensation contracts to better align employee and shareholder interests; and creating a new macroprudential regulator to look across the financial system and focus on its stability.

I agree with his concern that even some of the least controversial of these suggestions will be met with resistance by domestic groups who stand to be constrained by such changes. Coordinating globally will be even harder. The so-called Basel II reform took about a decade and these proposed changes are in many respects more fundamental and wide-reaching. I expect that many of these topics will remain on the table for the next few times that this conference convenes.

Within this set of proposals I am most intrigued by Barry's suggestion to form a World Financial Organization (WFO) that would be akin to the World Trade Organization. The WFO would be tasked with establishing principles for prudential supervision, but not necessarily getting into the details of the structure of regulation. It would define obligations for its members, and countries would be compelled to join in order for their domestic financial institutions to have free access to foreign markets. The WFO would monitor members' compliance with the rules and impose sanctions for noncompliance.

I like several aspects of this suggestion. First, it is bold. Why should the next iteration on reform proceed by moving around the boxes on the existing organizational charts? Second, it would greatly accelerate global harmonization of the rules, which otherwise will be the last step in the overhaul of the regulatory system. Until the loopholes are closed globally, the likelihood of success of reform is doubtful. Finally, it provides a unified approach to tackling many of the thorniest problems. Absent the creation of something like the WFO, the reforms are likely to be the product of a series of one-off negotiations because so many different changes will be required. This is an idea that deserves serious consideration.

The second perspective, which I will call the global imbalances view, presumes that the flow of savings from emerging economies and oil exporters into developed economies could not be effectively absorbed. The flows depressed interest rates, and monetary and fiscal policies were not effective in preventing large current account deficits in the U.S. and several other countries.

I agree with Barry that global imbalances have not been good for the world economy during this decade. But as he writes, "slightly more convoluted is the link to the particular constellation of financial weaknesses that culminated in

the crisis.” I would go farther and say that without the incentive problems highlighted in the first view it is hard to see how the global imbalances alone could have been so disruptive. I present more on the basis for this claim later.

Nonetheless, the events starting in 2007 still have a number of lessons for policymakers. Perhaps most important is that inflation targeting as practiced needs to be changed. As advocates of inflation targeting point out, today, in light of the unprecedented monetary accommodation that is in place, it is valuable to have an inflation objective to help anchor expectations. So we should not abandon it. But inflation targeting let us down a bit during the middle of this decade. The imbalances that were building were perhaps too easily dismissed as harmless because inflation was on target. It appears that a new consensus is emerging that suggests we will need to pay more attention to the financial system *per se*. In regulating it, other tools in addition to the short-term interest rate should be the first line of defense.

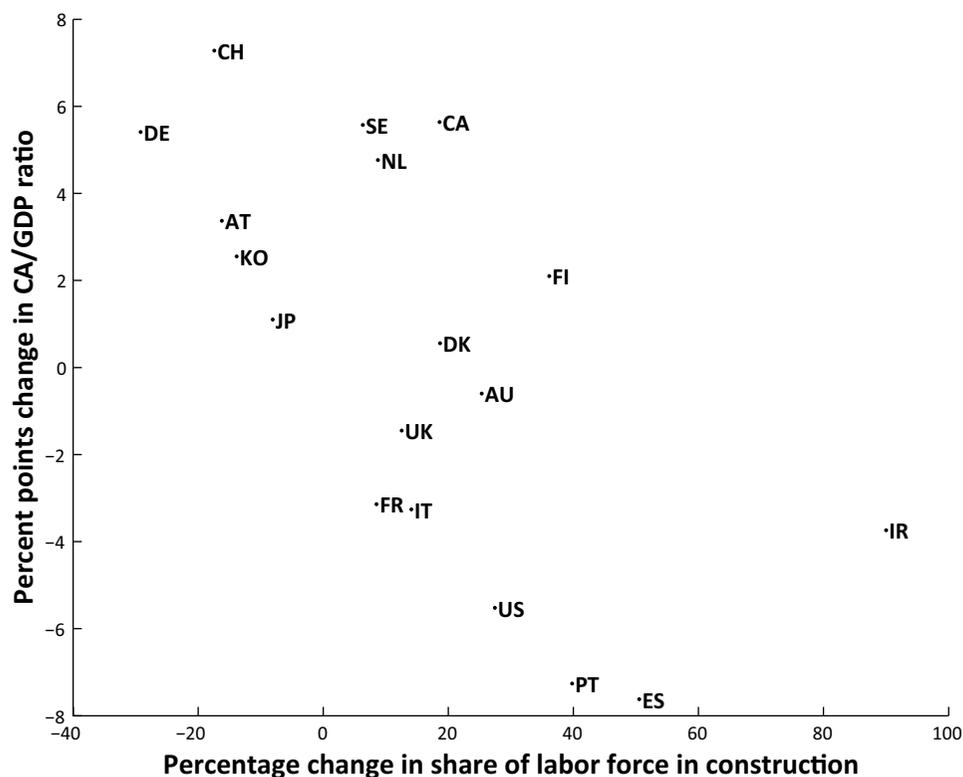
Barry points out that we also saw that either large current account surpluses or deficits have proved difficult to manage. Likewise, that procyclical fiscal policy and reserve accumulation have contributed to problems that we are now facing. Finally, he notes that the failure to let relative prices move in response to shifts in demand is undesirable.

2. Current Account Deficits and Banking Problems

I agree with all of these conclusions. But I believe that even if all of this advice had been followed, the incentive issues in the financial system were still likely to have caused problems. One basis for this claim are the data presented in Figure 1. These data are from Gete (2009) and show the association between the change in the current account and the share of labor in the construction for major economies between 1994 and 2006. One can see that current account deficits and housing booms occurred together during this period— this is the point of Gete’s paper and he shows that this pattern is evident using many different measures.

The banking problems, however, were not closely correlated with the current account imbalances. Banks in Switzerland and Germany, which saw their current accounts swing strongly toward surpluses, managed to get into plenty of trouble during the crisis. But so did banks in the U.S. where the patterns were reversed. Thus, the simplest story that a flood of savings poured into some countries and the banks in those countries could not absorb them does not look correct. A better story seems to be that the banks in most developed countries engaged in similar strategies and got into similar sorts of trouble. Perhaps the

FIGURE 1
Current Accounts and Labor Devoted to Construction, 1994–2006



Source: Gete (2009).

magnitude of the problems would have been reduced if the global economy had been better balanced, but I think the chances of avoiding a crisis were low.

3. More on Incentives

Given the primary emphasis I put on the role of incentives in exacerbating the crisis, I want to close by elaborating on some of the points Barry only briefly mentions and raise a couple of related observations.

In passing, in footnote 10, Barry mentions the problem of having the right compensation structure for regulators. This I fear is a much more serious challenge than he makes it out to be. Let me offer some numbers to put the problem in perspective. Bertand, Goldin, and Katz (2009) note

that the *median* salary and bonus for an MBA graduate from the University of Chicago who graduated between 1990 and 2006 and started out working as an investment banker and has nine years of experience is \$470,000 per year (regardless of whether he stays in investment banking). Perhaps more relevant, my informal sample of salaries last year for new PhDs in finance who received job offers at mid-tier business schools was a nine-month salary of roughly \$160,000. Typically these offers include an additional 22 percent stipend of summer support for the first few years of the contract.

This is the market in which the systemic risk regulator (SRR) will have to compete for talent. Assuming the SRR wants to hire roughly 50 PhDs, it is highly doubtful that this can happen given the existing pay norms at the U.S. Treasury or Federal Reserve. As already discussed, many of the looming regulatory challenges will require foundational research. If the staff of the SRR is not on the research frontier, the odds of success are low. Therefore, if the SRR is going to be effective, the compensation question will have to be addressed. The model developed to staff the Public Company Accounting Oversight Board suggests that this problem is not insurmountable, but it will require breaking away from the current government norms.

A second question is what tools will we give to the SRR? One of the disturbing aspects of the crisis is that there were some warnings offered that were ignored. The most persistent warnings came from the Bank for International Settlements (BIS). We (policymakers, politicians, and academics) should all ask why these concerns were ignored.

My conclusion is that part of the problem was that the BIS had no instruments with which to affect policy. This suggests that the SRR cannot be relegated to a pure monitoring role if it is to avoid the same fate. Thus, I favor starting the discussion soon about which policy levers we will give the SRR. There are many options for doing this (see Squam Lake Working Group 2009 and Kashyap and Stein 2009 for some options, so this is more a matter of choosing from existing ideas than developing new ideas.

Summing up, Barry's paper offers an excellent tour of the issues ahead. It would be great if we were to embrace many of the suggestions that he offers. But more important than the particular choices that are made is that we act now to prevent the problems we have seen over the last two years from reoccurring.

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GENERAL DISCUSSION
The Financial Crisis and Global Policy Reforms

Chair: Kevin M. Warsh

Mr. Warsh: I'll start with a question for both Barry and Anil. Given the breadth of necessary reforms, are you troubled by what seems to be the preoccupation in our nation's capital and across the world with institutional regulatory design questions? Is there too much emphasis legislatively on who does what—what's the role of the Federal Reserve and other regulators, how do they meet and consult—rather than what seems to be the point of both of your discussions, which is that there are efficiencies to be had in designing a new regulatory structure? Having four bank regulators within four blocks of each other is not optimal, but it sounds as though there is more emphasis in your thinking on what exactly they do, rather than what's the emblem on their business cards. So, I'll ask that question, then allow a few more questions from the crowd.

Mr. Mishkin: I wanted to turn to the issue of inflation targeting, which is not a surprise. But I think the issue here is that we have to recognize that monetary policy can only do so much. I'm actually in complete sympathy with the issues you've raised, that in fact central banks have to seriously worry about financial fragility. It's a primary part of their activity. In the United States, we have a dual mandate which is one, control inflation, and two, worry about output stability. A third goal for central banks is financial stability, and I think that's completely appropriate. The problem here is that the monetary policy tools in themselves may not be the right way to deal with the problems of financial fragility. This came out in Anil's discussion when he said that the real issue we have to worry about is where there's a market failure that creates incentives that can blow us up. So we have to think about what can we do in terms of reversing the incentives to actually get good behavior. That does not necessarily rule out that there might be some role for monetary policy in this. I'm somewhat skeptical, but I think it's a serious issue that we have to think about. I think the issue here is not reforming the inflation targeting regime, per se, but thinking about what the appropriate role is for a central bank in terms of managing financial fragility. I think we want to separate those two aspects out in terms of thinking about them.

Mr. Warsh: Great. Question from this side.

Mr. Yang: For global policy reform, Professor Eichengreen proposed that the Chinese renminbi, along with the U.S. dollar and the euro, may become an international reserve currency in 20 years' time. I think it is a very practical possibility, but some economists also have proposed that Asia should adopt a single currency, like the euro. My opinion is we should develop the Chinese renminbi and an Asian single currency at the same time. There is no doubt that establishing a single currency will be much more difficult for Asia than for Europe. However, over the long term, it'll be worth trying to do in order to facilitate Asian financial development and promote Asian interregional free trade. This would lead to three currency blocs: the U.S. dollar bloc, the euro bloc, and an Asian currency bloc. Within each bloc, exchange rates would be fixed to each other, but exchange rates would be freely floating across blocs. This would enhance the stability of the international monetary system because Asian countries would be less concerned about international capital flows and wouldn't need to hold so much foreign exchange reserves. Also, within each bloc it would be easier to conduct policy. In turn, it would be easier to reduce global imbalances and help reduce the probability of a global financial crisis. So, I would like to ask Professor Eichengreen his opinion about an Asian single currency.

Mr. Warsh: Excellent. Let me go back over here for questions from folks who haven't asked a question so far.

Mr. Dooley: I think the first order of business should be a study that looks carefully at whether, if we had enforced the rules we already have, could we have avoided this crisis? And I think the answer is yes. What we have lacked, as Anil suggests, is the supervisors, the well-trained motivated supervisors to enforce the rules we already have. We're going off spending way too much time not only deciding who does what, but writing down a new code that's supposed to solve the problems. It's not going to solve the problems. By the time the ink is dry, financial market practitioners will figure out ways to get around it. You need people equally competent to stop them from doing that, and that's going to require money and a real focus. A related point, which I think is very important and hasn't been mentioned, is that the Federal Reserve System can become an effective lobby in Washington for financial stability. You don't have to sit back and take it every time some new housing scheme shows up in Congress, you guys should be up there testifying against it. And the only way to do that effectively is to have a really well-motivated, independent supervisory structure and well-paid people to do it.

Mr. Oshima: I have a comment on the capital issue. I understand the importance of having enough capital to absorb financial losses; however, raising too much capital may lead investors or shareholders to require higher profitability, which might cause the banks to engage in riskier activity.

Mr. Warsh: Thank you. With those questions, let me turn first to Barry and then to Anil to respond.

Mr. Eichengreen: Let me start with some of Anil's comments. Is being over your skis a good thing or a bad thing? I'm not a skier. I think it probably matters where you're headed.

I think we agree about global imbalances more than we disagree, although you go a little further than I would in dismissing their importance. Did global imbalances cause the Great Depression of the 1930s? No, but the big capital flows from the United States to Central Europe in that period were a compounding factor that contributed to the collapse of Credit Anstalt in 1931 and the blowback to London and New York. Clearly there were a number of factors that contributed to construction booms and housing bubbles in different countries. When I look at Spain and Ireland, I look not so much at global imbalances as I do at European imbalances and the sharp decline in interest rates in the catch-up economies as they adopted the euro. And clearly there was something different and special going on inside those German and Swiss banking systems to explain their high leverage ratios, to explain the behavior of the Landesbanks. I think you can tell a story that's consistent with a role for global imbalances, that with the flow of foreign capital into the United States, U.S. banks had more resources with which to lever up their bets, and then Swiss and German banks responded by thinking they had to lever up their bets to retain market share. So, I don't think these things are entirely disconnected. My last comment for you, Anil, would be that advocating higher compensation for people involved in finance is not exactly fashionable at the moment.

Kevin asked whether I'm troubled by the emphasis in current discussions on institutional design and how many regulators there should be. No, to the contrary, I'm reassured because I think the problems we're going to have to face will be changing and what we have to do is try to put in place mechanisms, call them institutions, with the capacity to address those problems. I would argue that trying to think about whom the regulators should be, how many there should be, their relationship to the central bank, and so forth is directly on the mark. I think Mike Dooley's point about the need to enforce the regulations we have is consistent with this emphasis. As a sidebar, I agree that we should enforce the regulations we have, but I do bridle when I see this invoked as an

argument against reform. I'm sure Mike didn't mean it this way, that we don't need additional regulation or improved regulation in addition to enforcing the ones we have.

Regarding Rick Mishkin on inflation targeting, I'm not certain there's a substantive disagreement here. We see the same first-best world in which the regulators deal with problems inside the financial system. I may see a different second-best world in which these problems regularly end up in the lap of the central bank. A hundred years of U.S. history point in that direction, and longer spans of history in other countries suggest likewise. You asked the question that, if the central bank has to deal with these problems after the fact, does it need to use more systematically the limited instruments at its disposal to address these problems before the fact, especially in the case of liquidity crises where we know who the liquidity provider of last resort is? Does the central bank have to worry about the danger of the development of liquidity crises on a day-to-day basis when it thinks about the level at which it's setting its interest rates? To my mind, the answer is yes, leaving open the question of exactly how.

My final comment will be about the future of the international reserve system and the renminbi versus a single Asian currency. Usually the way the argument is framed is as "either/or." It was pointed out, I think correctly, that in principle, it's possible for Asia to move along parallel tracks where the renminbi is internationalized and plays a more important role in the settlement of trade and in the reserve system, while Asia continues to move forward to build toward a single currency. Consistent with this view is the fact that from the 1960s, the deutsche mark became more important as a reserve currency and an international unit, and that this didn't prevent Europe from ultimately moving to a single regional currency. Europe is special, just like Asia is special. Europe could do it because Germany faced some very special, peculiar circumstances in 1989–90 that left it prepared to make a commitment to abandon the deutsche mark. When I think about circumstances under which China might contemplate making a similar step, I conclude that the path to a single Asian currency will be a very long and winding one.

Mr. Kashyap: I think the answer to your question, Kevin, about institutional design is, yes, who wears what hat matters. Committees aren't going to do as well as other designs, but I think that getting the right to resolve an institution, dealing with qualified financial contracts, making sure that the information technology sub that's part of a holding company that goes bankrupt continues to function—that's all plumbing. And every day the politicians ought to answer why they won't fix the plumbing. So, I think we ought to get that figured out.

There are other marginal changes, but I think Mike's right, we could have done better.

I don't disagree with what Rick said about inflation targeting. I do think that once you take the agency issue seriously and you say you're going to commit to low interest rates for an extended period, you invite more risk taking that interacts with bad incentives inside the institutions. That's another thing you ought to keep your eye on. Now the supervisors are the ones that have to monitor these risks, but the central bank should be thinking a little bit about them as well. We shouldn't assume that the supervisors are going to be perfect in making their decisions, so you have to take out some insurance.

Finally, on the question of whether financial institutions will take on more risk if they raise capital, that was one of the reasons the contingent capital proposal that Jeremy [Bulow], Ragu [Rajan], and I made was framed the way it was. If you're worried about whether if you give banks more equity they'll seek more return, then issue debt and force them to pay out the cash flow to the debt holders when times are good and only convert into equity to absorb losses when times are bad. That's the best argument for contingent capital. You'd flunk a corporate finance exam question if you were asked, if you give more equity, what does that do to expected returns?—that doesn't make any sense when the Modigliani-Miller assumptions hold. But as soon as you break them, you're going to change the incentives for risk taking and that might be a first-order concern.

Mr. Warsh: Thank you, Anil. I think the remarkable surprise upside from the March [2009] lows until now with respect to financial institutions and capital-raising is how wide these capital markets have opened. In the U.S. and abroad, financial institutions have been seeking high quality capital, both to offset losses on their balance sheet as well as to put them on better footing in order to pursue future opportunities. And though I haven't subjected this to a ton of empirical work, I would say that those firms that raised more capital have seen their share prices increase, so more capital has been rewarded in the marketplace. I think the question for 2010 will be whether markets remain as open as they are today. Let me thank Barry and Anil for a great final session.

CLOSING REMARKS

Asia, the Financial Crisis, and Global Economic Governance

John Lipsky

I am grateful for the chance to be with you today at this interesting and timely conference. I would like to thank Janet Yellen and the Federal Reserve Bank of San Francisco for inviting me to speak to you on Asia and the global financial crisis.

We remain in the midst of an exceptionally difficult and challenging period. The past year's dramatic bout of financial turmoil, accompanied by large-scale wealth destruction, stunning declines in industrial production and in global trade and worrisome increases in unemployment have been met by an unprecedented policy response. Both the scale of the anticrisis measures and the level of international collaboration have been unique. It is therefore gratifying that consensus views evident at the IMF and World Bank Annual Meetings that just concluded in Istanbul are that the worst has past, and the healing process has begun. As difficult as the past year has been, there is a palpable sense that forceful policy actions succeeded in staving off even more negative outcomes.

Although our base case expectations—as detailed in the latest *World Economic Outlook*—anticipate renewed global expansion, it is only prudent to keep in mind that the global economy still faces considerable risks and challenges. To assure a durable exit from the crisis, and to build in its wake a more stable international monetary system will require continued broad-based international collaboration. In fact, fundamental shifts are under way already in global economic governance, involving new organizations, new methods, and a new sense of flexibility and innovation.

I will focus my remarks today on the role of Asia in this changing landscape, taking into account both the developments of the past year as well as the key challenges—and opportunities—that lie ahead.

The Crisis Response and Underlying Fundamental Changes

I am sure that you are all aware of the basic economic facts. Asia, despite its relatively strong initial condition entering the crisis, was hit hard late last year.

While it was not directly exposed to the financial assets that were at the epicenter of this global crisis, Asia was severely affected by the sharp downturn in the United States and Europe as the trade implications of the global downturn reverberated through the Asian supply chain, capital flowed out of the region, and trade finance stalled. Measured from peak to trough, real GDP has fallen by nearly 4 percent in the United States, but it fell by more than 8 percent in Japan and by about 7 percent in emerging Asia (excluding China, India, and Indonesia).

Fortunately, the global economy has begun to pull out of recession, and Asia looks set to emerge from the downturn both sooner and stronger than any other region. The IMF's most recent *World Economic Outlook* forecasts global economic contraction of about 1 percent this year and expansion of around 3 percent next year. At the same time, Asia is expected to grow by $2\frac{3}{4}$ percent this year and by $5\frac{3}{4}$ percent in 2010. Strikingly, the three fastest growing economies in the G-20 are all from Asia—China, India, and Indonesia—with China projected to grow $8\frac{1}{2}$ percent, India $5\frac{1}{2}$ percent, and Indonesia 4 percent this year.

Aside from growth, Asia is doing well when measured by other economic indicators. For example, inflation has virtually disappeared, expected to end the year at a regional average of just under one-half of one percentage point. Also, employment losses in Asia have been much milder during this downturn than in past recessions.

Some have argued that Asia's remarkable recovery reflects a decoupling from the rest of the world. However, the rebound so far reflects largely a return towards normalcy of trade and finance flows following their abrupt collapse at the end of 2008. In fact, those economies with some of the largest initial contractions were the so-called newly industrialized economies—Korea, Singapore, and Hong Kong—with large shares of high-tech and other manufacturing trade with advanced economies. And, just as the U.S. downturn triggered an outsized fall in Asia's GDP because international trade and finance froze, the normalization process is generating a rapid and strong Asian upturn.

The recovery also reflects quick and forceful policy actions in the region, including monetary easing, currency flexibility in many countries, and substantial fiscal stimulus—in fact, larger than the G-20 average. Asian countries also have provided substantial financial sector support, including blanket deposit guarantees, backstopping the issuance of banks' wholesale financing, and offering cover for corporations that had borrowed in foreign currency. The provision of cross-currency swaps, in some cases with the Federal Reserve, also helped to ease pressures in the region.

Finally, Asia's recovery is a testament to its strong fundamentals, including the sound balance sheets of its private sector. When the crisis broke out, Asia's banks and companies had solid capital positions, low leverage, and little exposure to toxic assets. As a result, banks have been both willing and able to lend, which has meant that credit has not slumped by as much as in other regions.

The resilience of Asian economies in this crisis, their substantial contributions to global growth in recent years and the region's importance in international capital flows are underpinning the transformation of international fora. For example, a discussion of global economic cooperation would seem hollow if China—likely the world's third largest economy—were absent. It should come as no surprise then that the G-20—with six representatives from the Asia-Pacific region—has been designated as the premier leadership forum for international economic cooperation among the largest economies.

Changes also are under way with regard to Asia's role at the IMF, as the region is receiving a larger voice in accordance with its growing weight in the global economy. Under the reform of IMF quotas agreed to in April 2008, underrepresented Asian countries stand to gain nearly 3 percentage points in quota shares. Still, the region remains significantly underrepresented and, in the next review of quotas to be completed by January 2011, further gains are to be expected.

Asia's rising influence in the global economy also is being mirrored in its financial assistance to the rest of the world. For example, the region has pledged to provide the IMF with US\$178 billion in new lending resources—a third of the total pledged through the New Arrangements to Borrow (NAB) as well as the Note Purchase Agreement—to support countries combating balance of payments pressures brought on by the crisis.

This reshaping of economic governance is timely, and an integral part of the broader effort to reform the global economic and financial framework—and thus to lay the foundations for strong, balanced, and hence sustainable growth in the future. Global cooperation will be necessary if this effort is to be successful.

Challenges and Opportunities Beyond the Crisis Response

Turning now to some of the key challenges in the period ahead, as well as opportunities for building a stronger post-crisis world, the principal near-term risk is that the global recovery could stall. This could occur if private demand does not pick up and replace the policy stimulus and inventory restocking that have recently been the key drivers of growth. Policy support therefore should remain in place until a durable recovery is secured.

Some Asian countries—particularly advanced and export-dependent economies that have experienced a relatively large cyclical weakening of their fiscal positions—are planning to withdraw fiscal stimulus over the course of 2010 in response to the signs of recovery. However, these plans should proceed cautiously until the recovery seems assured. At the same time, fiscal credibility could be enhanced by announcing concrete medium-term consolidation plans. Such plans will be particularly relevant for those countries starting from relatively high debt levels (including Japan, India, and Malaysia) and those facing looming age-related fiscal pressures (such as Japan and the newly industrialized economies of Korea, Singapore, Hong Kong SAR, and Taiwan Province of China). But even for the average Asian country, without fiscal adjustment, debt-to-GDP ratios are projected to remain above pre-crisis levels through 2014.

For the bulk of the region, monetary conditions should remain supportive for longer than has been the case in previous cycles. Inflationary pressures generally remain muted, as the output gap has widened. With the recovery still tentative, inflation risks currently low, and limited asset price increases so far, a near-term tightening of monetary policy would be premature for most countries.

But there are a few exceptions where action may be appropriate sooner than elsewhere. In Australia, the recovery is advancing rapidly and output gaps are starting to close, prompting the Reserve Bank to become the first major country central bank to raise interest rates since the onset of the crisis. In India, core inflation and inflation expectations are rising as industrial production has recovered rapidly. And in China, growth is accelerating and the extraordinary pace of loan growth in the first half of 2009 raises the risk of future loan quality problems.

Over the longer horizon, there are significant risks of anemic global demand if the policy choices are not mutually supportive. Achieving sustained healthy growth for all countries will depend critically on rebalancing the pattern of global demand—not just from public-sector supported growth to private-sector supported growth but also from relative reliance on external demand to domestic demand in surplus countries, and the reverse in deficit countries. Policy collaboration could help to insure that this process will take place in a mutually supportive fashion. In China as well as other emerging Asian countries that run large current account surpluses, the authorities have indicated their intention to emphasize policies that will support increased domestic demand, including via structural reforms. Increased exchange rate flexibility in some countries in the region will also be helpful in this process.

This rebalancing process will involve strengthening consumer confidence and facilitating a pickup in private investment in industries geared toward domestic markets. At the same time, improvements in corporate governance, financial intermediation, the quality of public investment, and social safety nets will help to continue improving productivity and support growth. In particular, research highlighted in the IMF's October 2009 *Asia and Pacific Regional Economic Outlook* notes that improvements in corporate governance and continued financial sector reform have the potential to bring down the high levels of corporate savings in Asia and contribute to global rebalancing.

Global Governance

In Pittsburgh, the G-20 leaders stated clearly their commitment to policy collaboration in order to most effectively address the difficult challenges that lie ahead. Their "Framework for Strong, Sustainable, and Balanced Growth" includes a cooperative, peer-review process—or mutual assessment—of their countries' policy frameworks. And they have asked the IMF to assist in this process, by developing a forward-looking analysis of the overall consistency of individual countries' policy frameworks with the overall goal of balanced and sustained global growth.

The IMF has considerable experience in analyzing members' policy frameworks and their implications for global economic and financial stability. This unique surveillance background has helped the Fund to provide timely and critical inputs to the international policy debate—for example, our call for an early and significant fiscal stimulus to cushion the crisis. The G-20 peer mutual assessment process should help to further enhance the traction and effectiveness of multilateral surveillance.

The Fund is also engaged in other relevant initiatives. We have launched an Early Warning Exercise in cooperation with the Financial Stability Board (FSB), focusing on systemic tail risks and the policy remedies that would be appropriate if such risks were to emerge. And we are improving other activities, such as the Financial Sector Assessment Program—that is conducted jointly with the World Bank—by sharpening the focus of assessments, making them more flexible and nimble, and strengthening their analytical content. And we are actively participating in the regulatory reform work of the FSB. These adaptations and reforms should help facilitate a collaborative approach to shared economic problems.

The IMF also can contribute to a more stable international monetary system and post-crisis global economy if it provides evenhanded and independent

surveillance, adequate financial support, and effective technical assistance. Moreover, critical governance reforms—that have been given an important boost by the G-20—should help assure emerging market and developing countries that their views will be reflected fairly. These reforms include aligning the voice and representation of members with their weight in the global economy. As I mentioned earlier, underrepresented Asian countries will gain about 3 percentage points in their Fund quota share as a result of the April 2008 agreement. And they are expected to receive further gains in the new quota discussions that are scheduled to be completed by January 2011.

One issue of importance that will involve directly many Asian economies is that of reserve accumulation and saving surplus. As you well know, many countries have rapidly built up official foreign exchange reserves over the past decade, in part as greater self insurance against balance of payments—primarily capital account—shocks. Global economic efficiency would have been enhanced if the IMF had been able to provide the insurance demanded by these countries, but doubts about the amount of available financing and the conditions attached to this financing have encouraged self-insurance.

Such self insurance is costly both at the country level—given the foregone domestic absorption and the complications for monetary and exchange rate policy—and at the international level, where countries wishing to build up their reserves have tended to generate persistent current account surpluses. There is a real danger that in the wake of the current crisis there could be renewed widespread efforts to add to reserves. It is clear that if such efforts are pursued simultaneously, one result would be to dampen the global recovery.

As the key institution endorsed by the global community for meeting the financial needs of economies in crisis, the IMF has a responsibility to offer effective alternatives to self insurance. The IMF's lending policies were recently overhauled to make them more responsive to the evolving needs of its member countries. Importantly, with the introduction of the Flexible Credit Line (FCL), the IMF now offers a preemptive insurance facility for members with strong policies. Mexico, Poland, and Colombia have used this facility, and their decision to do so was well received by international markets. In Asian countries such as Mongolia and Sri Lanka, traditional IMF programs have played an important role in mitigating the impact of the crisis. Further work is under way on building on the success of our new facilities, for example, by enhancing predictability of access to crisis financing.

Of course, crisis prevention instruments must be backed by sufficient resources in order to be credible, as recent experience has shown that financial crises can lead to an extraordinarily large demand for official resources.

The tripling this year of the IMF's lending resources to US\$750 billion has allowed us to deploy financial resources in unprecedented amounts to support a broad array of countries and to help stabilize markets. To date, we have committed funds totaling more than twice the amount that were lent during the Asian crisis.

These resources, are temporary, however, requiring approval every five years, and they are contingent, activated only when a crisis is looming or under way. So, while these resources have proved sufficient so far in this crisis, they may not be enough to reassure markets and members—particularly those emerging Asian countries that are accumulating reserves from a self-insurance motive—that this would necessarily be the case in future. As a result, the overall size of Fund quotas will be reviewed along with the shift in voting shares by January 2011.

Conclusion

In conclusion, the economy is recovering from a crisis, the fallout of which will be with us for years. But this recovery remains somewhat fragile, and there are many risks and challenges to a durable exit from the crisis. At the same time, fundamental changes are under way in global economic governance that bode well for the future. Policymakers have come together in these challenging times, and have strongly committed themselves to finding shared solutions to common problems.

The path out of the crisis will not be easy. But as long as we remain committed to create an effective multilateral process, we will be able to build a more stable and more productive international monetary and financial system that will benefit generations to come.

Thank you.

GENERAL DISCUSSION
**Asia, the Financial Crisis,
and Global Economic Governance**

Chair: Kevin M. Warsh

Mr. Warsh: I think John is available for a couple of questions.

Mr. Hale: As you said in your talk John, the IMF did encourage 9 to 12 months ago that countries should pursue fiscal stimulus to cope with the recession and the financial crisis. The big issue I think now looming over the next two or three years is how we'll disengage from these policies because we do have some very, very large structural deficits out there. The U.K. deficit is 13 percent of GDP and that's without any fiscal stimulus. That's simply because Tony Blair built an economy on asset inflation. The British government had money coming from property tax turnover and from city of London revenues, which have fallen in half this year. The U.S. has a structural deficit. Once we're into a recovery going out three or four years, it looks like it's about 6 percent of GDP, bigger than it was in the Reagan years, which was also thought to be unsustainable. Then you've got a massive deficit in Japan with a new government that wants a lot of new tax cuts and things like that. Their public debt could exceed 200 percent of GDP in two or three years. What can the international community, or the IMF in particular, do to encourage a return to fiscal responsibility?

Mr. Lipsky: As a point of information, it was actually in January 2008 that Dominique Strauss-Kahn stated in Davos that substantial fiscal stimulus was going to be needed to counteract the crisis. And at the Peterson Institute in March 2008, I said that direct budgetary support for financial institutions was going to be necessary to counteract the crisis.

You used the word exit strategies, which is certainly a useful and widely used term. It makes me gun-shy, frankly, because it sounds like there's a light switch and the issue is, when do we turn the switch from on to off. It seems to me that's one of the hopeful signs of the creation of the framework for a strong, sustainable, and balanced growth. In other words, we face a whole myriad of very big challenges of which the removal of policy stimulus and direct discretionary stimulus is but one of many questions, and I think your question refers

to one of the critical challenges, one that we've been trying to call attention to. You'll find this discussed in some detail, for example in the latest *World Economic Outlook*, where we have a rather striking graph that portrays the net present value of the expected fiscal deficits in the leading economies. What it points out is that, even though the anti-crisis efforts are having a substantial impact on the overall debt-to-GDP ratio of the advanced economies, our figure is that, under current programs—in other words assuming that the 2010 discretionary stimulus is actually implemented as planned—the overall debt-to-GDP ratio for the leading G-20 countries is going to go from about 70 percent of GDP to about 100 percent by 2014. Trying to reduce the debt-to-GDP ratio on some plausible time frame, not a quick one, back to just the pre-crisis levels will require quite eye-popping levels of primary surpluses. And this is before you begin to deal with the issue that, according to the promises on the books in advanced economies, the combination of demographics plus plausible assumptions about increases in health-care costs are going to balloon the debt.

As I said, if you look at it in a net present value context, the anti-crisis measures are really a very small part of the fiscal problems that face us over the next couple of decades. As I've told our Fiscal Affairs Department, over the past couple of decades they've gotten used to worries about fiscal problems in developing emerging economies. I think in the next 10 to 15 years we're going to be talking about how to deal with fiscal challenges in the advanced economies. So it seems to me that this is exactly the context in which a collaborative strategy and collaborative approach should be useful. As I said, these are big problems. There's no guarantee they're going to be solved easily. I think it's quite encouraging that in every area so far the political response has been both collaborative and innovative. Now let's see if we can carry it through. It's going to be tough.

Mr. Warsh: One final question for John?

Ms. Mandaro: Today we saw Brazil impose a tax on foreign purchases of fixed income securities. This seems designed to tamper the capital inflows that have been the subject of so much discussion. Are you concerned about more controls like this being introduced? Would this be a bad thing? Can you give me your thoughts on that?

Mr. Lipsky: I'm probably going to disappoint you here. Since I haven't had a chance either to look at those Brazilian measures in detail or consult my colleagues, I don't really have any specific response. But it points out the kind of problems that have been raised by the rebound in capital flows. Obviously

there is a very positive element, a positive message that we've heard about the rebound in asset prices in emerging markets. It was only a few months ago that we were looking at a very severe sudden stop in capital flows to many emerging market economies. That has reversed with a vengeance, as it's been recognized that these economies have shown greater resilience and greater promise than might have been expected even months ago. So this is the good part. The challenges of adequate management are obvious, and again I don't have any particular response to the Brazilian measures.

Mr. Warsh: Thank you very much John.

Contributors

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Board of Governors of the Federal Reserve System

Mr. Bernanke took office in February 2006 as Chairman and member of the Board of Governors of the Federal Reserve System. He also serves as Chairman of the Federal Open Market Committee. From June 2005 to January 2006, he was Chairman of the President's Council of Economic Advisers. He was also a member of the Board of Governors of the Federal Reserve from 2002 to 2005.

Previously, Mr. Bernanke was the Class of 1926 Professor of Economics and Public Affairs at Princeton University. He was the Howard Harrison and Gabrielle Snyder Beck Professor of Economics and Public Affairs and chair of the Economics Department at the university from 1996 to 2002. Before arriving at Princeton, he was an associate professor of economics from 1983 to 1985 and an assistant professor of economics from 1979 to 1983 at the Graduate School of Business at Stanford University. His teaching career also included serving as a visiting professor of economics at New York University and at the Massachusetts Institute of Technology.

Mr. Bernanke has published many articles on a wide variety of economic issues, including monetary policy and macroeconomics, and he is the author of several scholarly books and two textbooks. He has held a Guggenheim Fellowship and a Sloan Research Fellowship, and he is a Fellow of the Econometric Society and of the American Academy of Arts and Sciences. Mr. Bernanke has held numerous academic service positions, including Director of the Monetary Economics Program of the National Bureau of Economic Research (NBER), member of the NBER's Business Cycle Dating Committee, and editor of the *American Economic Review*.

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Mr. Caballero has also been a visiting scholar and consultant for the European Central Bank, the Federal Reserve Board of Governors, the Inter-American Development Bank, the International Monetary Fund, the World Bank, and central banks and government institutions throughout the world. He serves on the editorial boards of several academic journals and has won several awards for his research. His current research looks at global capital markets, speculative episodes and financial bubbles, systemic crises prevention mechanisms, and dynamic restructuring.

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Before joining JPMorgan Chase, Mr. Crockett was General Manager and CEO of the Bank for International Settlements from 1993 to 2003, and was the first Chairman of the Financial Stability Forum (now the Financial Stability Board) from 1999 to 2003. Earlier in his career, Mr. Crockett held senior positions at the International Monetary Fund and served as an Executive Director of the Bank of England.

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Mr. Eichengreen has held Guggenheim and Fulbright Fellowships and has been a Fellow of the Center for Advanced Study in the Behavioral Sciences at Stanford University and the Institute for Advanced Study, Berlin. He has published numerous books and articles in leading academic journals in the field of international finance. He is a monthly columnist for Project Syndicate. He was awarded the Economic History Association's Jonathan R.T. Hughes Prize for

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Between 1991 and 2000 he served two terms as the Governor of the Bank of Israel. Between 1987 and 1991, he was the Economic Counselor and Director of Research at the International Monetary Fund, and between 1973 and 1987 he was on the faculty of the University of Chicago where he held the position of the David Rockefeller Professor of International Economics and served as editor of the *Journal of Political Economy*. He is a member and director of several professional and academic associations and has received awards in economics from the Israeli, Czech, and Italian governments. He is the author of numerous books and articles in the fields of international economics and macroeconomics.

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Mr. Goldstein is the Dennis Weatherstone Senior Fellow at the Peterson Institute for International Economics (PIIE). Prior to joining PIIE in 1994, he spent twenty-five years on the International Monetary Fund (IMF) staff, the last eight as Deputy Director of the IMF's Research Department. In 1999, he was the Project Director for the Council on Foreign Relations' blue-ribbon task force on international financial architecture. He consults widely with central banks, ministries of finance, international financial organizations, and private financial institutions.

Mr. Goldstein has written extensively on financial crises in both industrial and emerging economies, on international banking standards, on reform of the international financial architecture, on currency mismatching in emerging economies, on early warning indicators of currency and banking crises, on international capital flows, on exchange rate policies, and on empirical models of international trade. His latest book is *The Future of China's Exchange Rate Policy*, coauthored with Nicholas Lardy. He is currently at work on a book dealing with financial regulation after the global credit crisis.

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Mr. Heng, as the Managing Director of the Monetary Authority of Singapore (MAS), oversees the policies and operations of MAS. MAS operates as the central bank of Singapore, as well as an integrated supervisor of the financial services industry, covering banking, insurance, and capital markets.

Prior to this position, Mr. Heng was the Permanent Secretary of the Ministry of Trade and Industry, overseeing economic policy, trade negotiations, and the regulation and development of industry. Before assuming this appointment, he was the Chief Executive Officer of the Trade Development Board. Mr. Heng has also served in the Prime Minister's Office and in various positions in the Singapore Civil Service.

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He is an author of many books, including *The Japanese Economy*, *The Political Economy of Japanese Monetary Policy*, and *Financial Policy and Central Banking in Japan*, and numerous articles in leading academic journals on international finance and the Japanese economy. He is also currently the editor of the annual National Bureau of Economic Research East Asia Seminar on Economics monograph.

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Prior to joining the Chicago Booth faculty in 1991, Mr. Kashyap spent three years as an economist for the Board of Governors of the Federal Reserve System. He currently works as a consultant for the Federal Reserve Bank of Chicago and serves as a member of the Economic Advisory Panel of the Federal Reserve Bank of New York and as a Research Associate for the National Bureau of Economic Research. He is one of the advisers to the Cabinet Office of the Government of Japan for its research project on “The Japanese Economy and Macroeconomic Policies over the Last Twenty-Five Years,” is on the Congressional Budget Office’s Panel of Economic Advisers, and serves on the Board of Directors of the Bank of Italy’s Einaudi Institute for Economics and Finance.

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She was First Deputy Managing Director of the International Monetary Fund from 2001 to 2006. From 1982 to 1986, Ms. Krueger was Vice President, Economics and Research, at the World Bank. She has taught and held visiting professorships at a number of universities in Asia, the United States, and Europe. Ms. Krueger has published extensively on economic development, international trade and finance, and economic policy reform.

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Mr. Lipsky assumed the position of First Deputy Managing Director of the International Monetary Fund (IMF) on September 1, 2006. Before joining the IMF, he was Vice Chairman of the JPMorgan Investment Bank. Previously, he was Chief Economist at JPMorgan, Chase Manhattan Bank, and Salomon Brothers, Inc.

Before joining Salomon Brothers in 1984, he spent a decade at the IMF, managing the Fund's exchange rate surveillance procedure, analyzing developments in international capital markets, and serving as the Fund's Resident Representative in Chile from 1978 to 1980. In 2000, he chaired a Financial Sector Review Group to provide the IMF with an independent perspective on the Fund's work on international financial markets. Mr. Lipsky's current professional activities include serving on the Board of Directors of the National Bureau of Economic Research.

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Mr. Mohan was named Distinguished Consulting Professor at the Stanford Center for International Development at Stanford University in June 2009. He was Deputy Governor of the Reserve Bank of India from 2002 to 2009, where he was responsible for the departments of monetary policy, statistical analysis and computer services, economic analysis and policy, financial markets, and the secretary's department. From October 2004 to July 2005 he interrupted his career with the Reserve Bank to serve as Secretary, Department of Economic Affairs in the Ministry of Finance.

He started his professional career at the World Bank in 1976 as an economist at the Development Economics Department and has served on numerous government advisory boards and as a director of various Indian banks. His research has been in the areas of economic reform and liberalization, industrial economics, urban economics, infrastructure studies, economic regulation, monetary policy, and the financial sector. He is the author of three books on urban economics and urban development and of numerous articles. His 2009 book entitled *Monetary Policy in a Globalized Economy: A Practitioner's View* focuses on issues relating to the evolution of banking and finance, the conduct of monetary policy, the management of the financial sector, and the role of central banking.

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Mr. Sato was Commissioner of Japan's Financial Services Agency (FSA) from July 2007 to July 2009. He is currently Adviser to the FSA. Prior to serving as Commissioner, he was Director-General of the FSA's Supervisory Bureau from 2004 to 2007 and Director-General of its Inspection Bureau from 2002 to 2004.

He participated actively in the work of the Financial Stability Forum (now reorganized as the Financial Stability Board) as a member of the Forum's Working Group on Market and Institutional Resilience beginning in 2007. He was also a member of the Monitoring Board of the International Accounting Standards Committee Foundation during his tenure as the Commissioner of the Japan FSA. Between 1999 and 2001, he served as a professor at Nagoya University.

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Kevin M. Warsh, Member

Board of Governors of the Federal Reserve System

Mr. Warsh took office as a member of the Board of Governors of the Federal Reserve System in February 2006. Prior to his appointment to the Board, he served as Special Assistant to the President for Economic Policy and as Executive Secretary of the National Economic Council from 2002, where his primary areas of responsibility included domestic finance, banking, securities, and consumer protection. Mr. Warsh participated in the President's Working Group on Financial Markets and served as the administration's chief liaison to the independent financial regulatory agencies.

From 1995 to 2002, Mr. Warsh was a member of the Mergers & Acquisitions Department of Morgan Stanley & Co. in New York, serving as Vice President and Executive Director. He served as financial adviser to numerous companies across a range of industry sectors, including manufacturing, basic materials, professional services, and technology.

Daniel Danxia Xie, Research Assistant

Peterson Institute for International Economics

Mr. Xie is Research Assistant at the Peterson Institute for International Economics. His research interests lie in the fields of open-economy macroeconomics, finance and growth, including exchange rates/exchange rate regimes, international financial architecture, international capital flows, financial systems and systemic risk modeling, and new monetary policy frameworks. Before joining the Peterson Institute, he initiated the Harvard U.S.-China Economic Interaction Forum, with an aim to build a high-profile platform for distinguished scholars, professionals, and students to discuss important economic issues between the United States and China.

Mr. Xie has coauthored several academic papers, including “The U.S. Credit Crisis and Spillovers to Asia” with Morris Goldstein and “Identifying Structural Changes in De Facto Exchange Rate Regimes” with Jeffrey Frankel.

Janet L. Yellen, President and Chief Executive Officer

Federal Reserve Bank of San Francisco

Ms. Yellen took office as President and Chief Executive Officer of the Federal Reserve Bank of San Francisco in June 2004. She is Professor Emeritus at the University of California, Berkeley, where she was the Eugene E. and Catherine M. Trefethen Professor of Business and Professor of Economics and has been a faculty member since 1980.

From August 1994 through February 1997, she served as a member of the Board of Governors of the Federal Reserve System, and then left the Fed to become Chair of the President’s Council of Economic Advisers through August 1999. She also chaired the Economic Policy Committee of the Organisation for Economic Co-operation and Development from 1997 to 1999. Ms. Yellen has written on a wide variety of macroeconomic issues, while specializing in the causes, mechanisms, and implications of unemployment.

Ms. Yellen is a member of the Group of 30 (G30), the Council on Foreign Relations, the American Academy of Arts and Sciences, and a Research Associate of the National Bureau of Economic Research. She also serves on the board of directors of the Pacific Council on International Policy, on the executive committee of the Bay Area Council, and in the recent past she served as President of the Western Economic Association, Vice President of the American Economic Association, and a Fellow of the Yale Corporation.

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