

Lenders of Last Resort in a Globalized World

Keynote Speech by Maurice Obstfeld

The recent financial crisis teaches important lessons regarding the lender-of-last resort (LLR) function. Large swap lines extended in 2007–08 from the Federal Reserve to other central banks show that the classic concept of a national LLR fails to address key vulnerabilities in a globalized financial system with multiple currencies. What system of emergency international financial support will best help to minimize the likelihood of future economic instability? Acting alongside national central banks, the International Monetary Fund (IMF) has a key role to play in the constellation of LLRs. As the income-level and institutional divergence between emerging and mature economies shrinks over time, the IMF may even evolve into a global LLR that channels central bank liquidity where it is needed. The IMF's effectiveness would be greatly enhanced by several complementary reforms in international financial governance, though some of these appear politically problematic at the present time.

Keywords: Lender of last resort; Financial crisis; Central banking; International monetary system; International Monetary Fund

JEL Classification: E58, F33, F36

University of California, Berkeley (E-mail: obstfeld@econ.berkeley.edu)

This paper was prepared for the 2009 International Conference, "Financial System and Monetary Policy Implementation," held by the Institute for Monetary and Economic Studies, Bank of Japan in Tokyo on May 27–28, 2009. I thank Matteo Maggiori for excellent research assistance and the Coleman Fung Risk Management Research Center and Class of 1958 Chair at the University of California, Berkeley for financial support.

The main danger in international banking today is from a credit shock that would wipe out most or all of the capital of major international banks. Even if LLR [lender of last resort] arrangements were effective and banks not fatally damaged by such a shock had continued access to credit, the disruption caused by major bank insolvencies would require remedies that go far beyond the functions of the LLR.¹

I. Introduction

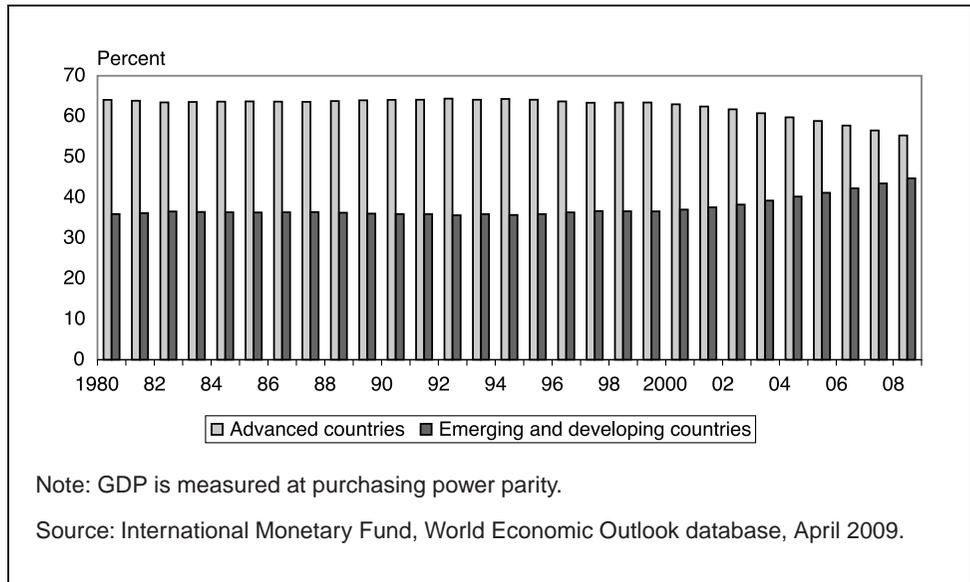
The time was the early 1980s and the prospective shock was a concerted default by indebted developing countries, a shock that could have wiped out the capital of major money center banks. In the event, official suasion bolstered by easier money averted the coordination failure of a wholesale run on developing economies. The developing world suffered a lost near-decade of growth, of course, but the effects on industrial-world prosperity were contained. While this near-death experience (like those that followed in the 1990s) prompted debate over possible reforms—and even some concrete actions—the pace of global financial development has continued to outstrip the capacities of regulators and regulatory structures. The stage was set for the current worldwide meltdown, a series of shocks unprecedented in scope and macroeconomic impact since the banking turbulence of the early 1930s.

What does the 2007–09 crisis teach us about the role of lenders of last resort (LLRs) in a financially globalized world made up of politically sovereign nations? The economic and financial landscape has evolved dramatically since the less-developed-country (LDC) debt crisis that began in 1982. Notwithstanding the current difficult environment, much of that evolution is desirable and is in any case likely to be irreversible. The new global landscape has now led to a degree of interdependence between poorer and richer economies that offers benefits but also entails a higher degree of systemic risk than in the past. Our challenge going forward stems from the reality that political globalization lags far behind economic globalization, and is likely to do so for the foreseeable future. Given that constraint, what system of emergency international financial support will best help to minimize the likelihood of global slumps and price instability? I will argue below that, acting alongside national central banks, the International Monetary Fund (IMF) has a key role to play in the constellation of LLRs. Its effectiveness would be greatly enhanced by several complementary reforms in international financial governance. Unfortunately, some of these appear politically problematic at the present time.

II. Changes since the 1980s

For more than two decades, economies in both the developing and industrial worlds have become more open and interdependent. The poorer countries as a group have assumed increased importance in the world economy, and countries everywhere have

1. Guttentag and Herring (1983).

Figure 1 Country-Group Percentage Shares in World GDP

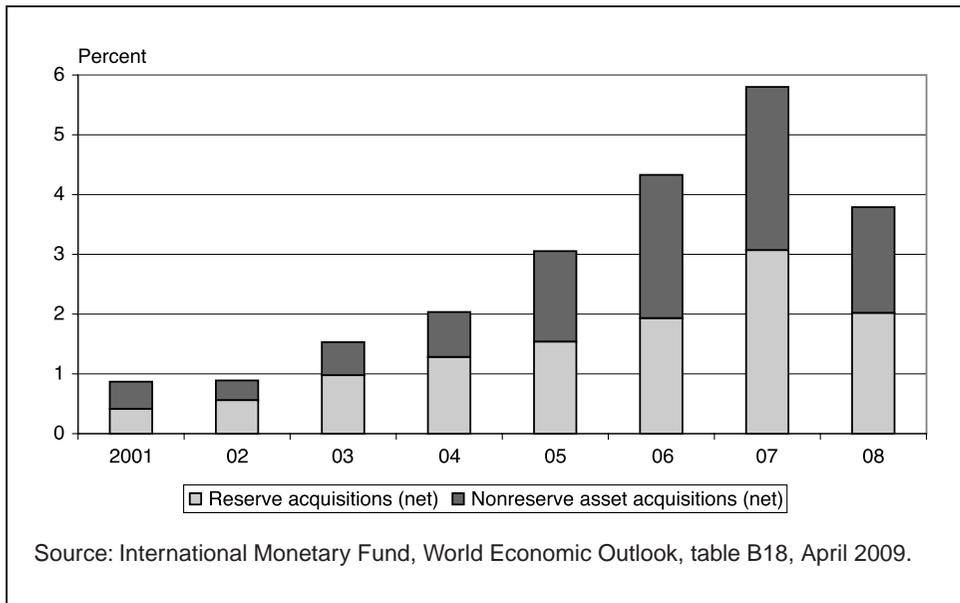
shown a tendency to liberalize their financial systems. Particularly in the less industrialized areas of the world, financial development has accompanied the growth in living standards. My thesis is that the interdependence between rich and poor countries has grown and, while remaining asymmetrical in several respects, has become much less so in some. The new global economy offers less scope for “decoupling,” more for systemic shocks, and any discussion of the global financial architecture must recognize this fact.

A first and obvious indicator of the less-industrialized world’s importance is its share of global GDP. Figure 1 shows the shares of rich and poorer countries in world GDP, where GDPs are valued at purchasing power parity exchange rates (to give a better sense of relative weights in tradable GDP). From 1980 through 1999, the advanced-country share held steady in the range of 62 to 64 percent. By 2008 the rich and poor shares, at 55 and 45 percent, respectively, were much closer to equality.² Another quantitative indicator of weight in the world economy is trade. Over the 2000s, the export and import volumes of emerging and developing countries have grown significantly faster than those of the advanced economies. Data from the IMF’s World Economic Outlook database (April 2009) show that the advanced-country share in world trade dropped from 79 percent in 1999 to 67 percent in 2008 (with “trade” defined as the value of imports plus exports).

The importance of the less-developed world in the financial markets of the more mature economies has proceeded even more rapidly than the growth of trade. Figure 2 shows the ratio of emerging and developing country net asset acquisitions in advanced

2. Since 1999, the advanced-country share in world GDP at current market prices has dropped from 81 percent to 69 percent.

Figure 2 Emerging and Developing-Country Asset Purchases in Advanced Countries, as a Percentage of Advanced-Country GDP



countries to advanced-country GDP. The asset flows are divided into net reserve and nonreserve transactions, the latter comprising private transactions as well as the activities of sovereign wealth funds. In 2007 the weight of such purchases in advanced-country GDP neared 6 percent, before falling back below 4 percent as a result of the global deleveraging of 2008. Still, one can expect the potential impact of the global south on the advanced financial markets to continue its growth over time once the current financial turbulence subsides. It is estimated that the sum total of emerging and developing reserve plus nonreserve government foreign assets is currently around 15 percent of rich-country GDP (Alberola and Serena [2008]). Of course, even in the early 1980s, the particular exposures of large industrial-country banks made them vulnerable to a systemic LDC debt shock.

Complementing and in part causing recent financial trends has been a secular process of financial market deregulation in mature and emerging markets alike. Indexes of financial market restriction are reported in Figures 3 and 4, which cover, respectively, the emerging and mature economies. The indexes are taken from Kaminsky and Schmukler (2008) and give a coarse indication of the trends in repressive regulations concerning the capital account, the domestic financial system, and stock markets. The second of these measures is concerned primarily with banks and the presence of interest rate restrictions and direct government allocation of credit. In particular, it does not capture the growth of important and lightly regulated shadow banking systems in advanced economies such as those of the United States and the United Kingdom. Nonetheless, the indexes convey an accurate impression that especially since the late 1980s, both internal and external financial barriers have fallen quite sharply and widely. Not only

Figure 3 Index of Financial Restriction: Emerging Markets

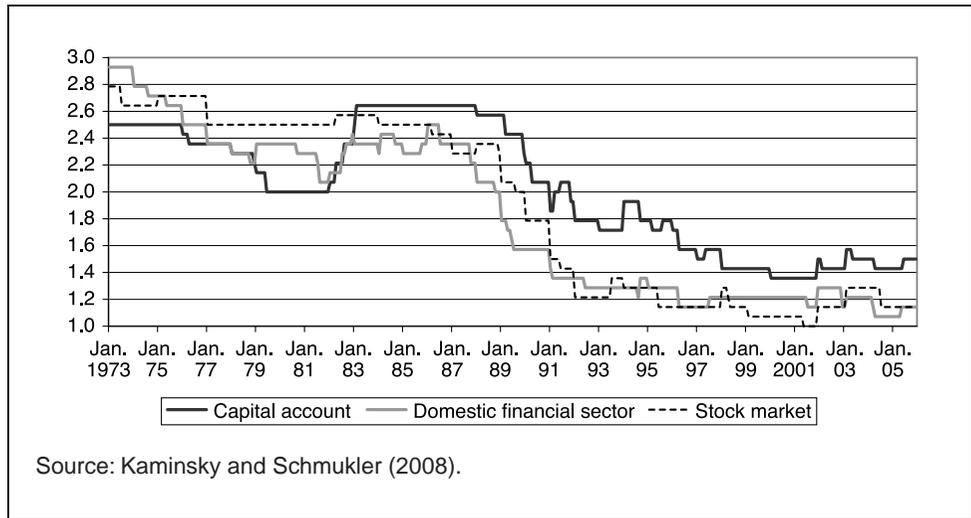
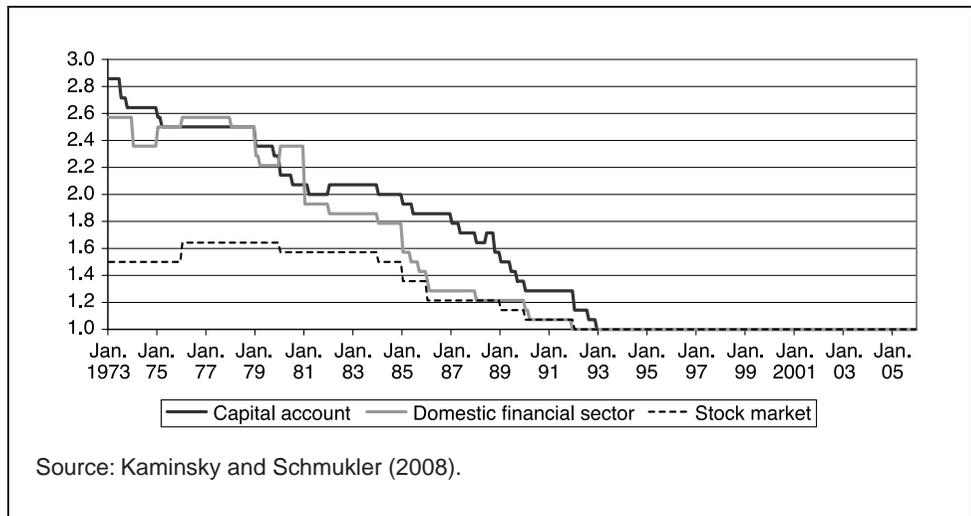


Figure 4 Index of Financial Restriction: Mature Economies



are national financial systems more interconnected today than at any time since the gold standard; in addition, national financial systems themselves have become far more extensive and complex than ever before.³

For my purposes, the critical implication of greater complexity and interconnectedness is that it can raise the scope for global systemic shocks. An analysis of how LLRs operate in an international context must take this possibility into account.

3. For further documentation of the growing importance and financial integration of emerging countries, see Committee on the Global Financial System (2009).

III. The LLR Function

At least in a closed economy, the *theoretical* case for an LLR is well accepted. The case is based on the inherent potential instability of fractional reserve banking, or more generally, of any scheme of financial intermediation in which short-term liabilities fund longer-term or possibly illiquid assets. Generally the central bank is viewed as the most plausible LLR, though this need not be the case and indeed, there can be more than one official emergency lender. There is much less agreement about how and when the central bank should exercise its LLR role *in practice*—as the recent crisis has amply illustrated.

In a global context, the balance-sheet mismatches justifying the LLR function are broader and more complex, because currency mismatch becomes a key factor. Yet the scope for a single central bank to intervene effectively in the presence of currency mismatch is obviously far more limited than in the case of pure term mismatch. There are at least two further problems. The internationalization of firms' financial operations has blurred the lines of responsibility for national LLRs (Guttentag and Herring [1983]). And even more importantly, central bank actions have effects on foreign financial markets, not least through potential effects on exchange rates, and in a situation of global distress such actions, if widely pursued by individual authorities, may further destabilize world markets. Once again, the recent crisis offers vivid illustrations of these mechanisms, as I describe shortly.

A major rationale for LLR intervention is the likelihood that a given institution's failure could bring into question the creditworthiness of other market participants, leading to a generalized cascade of otherwise avoidable defaults. In an unrealistically idealized case, a single bank, say, loses retail deposits and short-term funding due to a pure panic on the part of creditors. By providing cash, the LLR can prevent a costly coordination failure—costly because of possible external effects as well as the unnecessary bank closure itself—at essentially no expense to taxpayers. According to received views, however, an insolvent institution should not receive LLR assistance, as it would be unable to repay its creditors in full even by selling off all its assets in liquid resale markets. Resolution of the problem might or might not be brokered by the central bank. Normally, however, any taxpayer monies pledged in the deal—including any guarantees extended to contain market contagion—would ultimately be backed by the fiscal authorities' taxation capacity.

The seemingly neat distinction between merely *illiquid* and truly *insolvent* institutions, while meaningful in some simple theoretical models, is of limited applicability in practice. Liquidity problems rarely if ever hit an isolated intermediary unless there is good reason for lenders to attach at least some probability to insolvency.

In addition, *generalized* financial distress blurs the distinction further, as the myriad negative externalities that arise in broader crises can easily transform illiquidity into insolvency. In a generalized crisis, informational asymmetries become more acute (who is exposed to which counterparties?) and capital positions may plummet as institutions simultaneously attempt to reduce leverage through asset sales into illiquid markets. As Fischer (1999, p. 88) observes:

The line between solvency and liquidity is not determinate during a crisis. If a crisis is well managed, the number of bankruptcies may remain small; if it is badly managed, it may end in general illiquidity and insolvency. A skilled lender of last resort, able to assure the markets that credit can and will be made available to institutions that would be solvent in normal times, can help stem a panic and reduce the extent of the crisis.

Almost by definition, aggregate or systemic shocks—for example, the collapsing price of a widely held asset such as housing—can result in widespread and justified fears of insolvency. It may become quite difficult to tell which institutions would be solvent in normal times, and if the crisis fans out to affect the broader economy, the scope of insolvency will rise further. Because of the very real threat of insolvency in a generalized crisis and the high likelihood that at least some institutions are revealed to be insolvent even in the absence of panic, the central bank's LLR support alone, while critically important and usually the first line of defense, must be deployed in concert with the government's powers of sovereign borrowing and conventional taxation. Guttentag and Herring (1983) make this point in the quotation with which I started.

While these difficulties afflict policymakers even in closed economies, the challenge they face in open economies is greater still, as I suggested above. It is interesting to reflect, therefore, that the classical 19th century writers on the central bank's LLR role, especially Henry Thornton, acknowledged the linkages among domestic financial conditions, international capital flows, and the exchange rate. Thornton's paradigm was the open economy—but the focus was the single open economy rather than the financial stability of a global economic system. Despite earlier episodes of international financial contagion, the most dramatic illustrations to date of the repercussions of a *global* panic come from the onset of the Great Depression. Kindleberger (1986, chapter 9) famously decried the failure of the United States and United Kingdom to act consistently as LLRs in those critical years, and documents that even at the time several economists and policymakers (including Hawtrey and Keynes) were keenly aware of the need for a global emergency lender.

That awareness led to the establishment of the IMF in 1946. In the immediate postwar world of repressed domestic finance and largely closed international capital markets, however, IMF lending was not intended to prevent financial contagion through the world economy. Instead, the goal was to support exchange rate stability without recourse to the overly contractionary macroeconomic policies that had deepened the Great Depression. In the earliest versions of the Bretton Woods system, national LLRs were adequate to the task of preserving the stability of domestic finance, which had minimal exposure to foreign finance (and was itself relatively limited in scope). With the increasing flexibility of exchange rates after 1973 and the related liberalization of domestic and global finance, the IMF's role has evolved considerably and a strong case for global last-resort lending has emerged.

IV. LLRs in the Current Crisis

The balance sheet of the Federal Reserve System has seen an unprecedented expansion since the collapse of broker/dealer Lehman Brothers in September 2008. The U.S. monetary base doubled from about US\$850 billion at the end of August 2008 to about US\$1.7 trillion by the end of January 2009. Other central banks have likewise expanded their balance sheets, although not as dramatically. These support operations, often targeted on specific institutions or asset classes, have been complemented by fiscal support measures such as government loans, government guarantees, capital injections, and proposed fiscal subsidies for purchases of impaired assets from banks and other financial institutions.

From the international perspective, a key development is the extension of central bank credits to foreign central banks—most notably the Fed’s expansion of reciprocal swap lines with industrial-country and emerging-market central banks. In October 2008, the Fed removed limits on the sizes of U.S. dollar credits to the European Central Bank (ECB), Bank of Japan, Bank of England, and Swiss National Bank (SNB). This remarkable provision allowed the non-U.S. central banks to supply financial markets with potentially unlimited quantities of dollars (albeit on a temporary basis). The resulting flexibility for foreign central banks to act as LLRs of dollars was a major departure from past practice.⁴ There have also been initiatives in nondollar currencies such as the November 2008 ECB and SNB agreements to supply their currencies to the National Bank of Poland.⁵

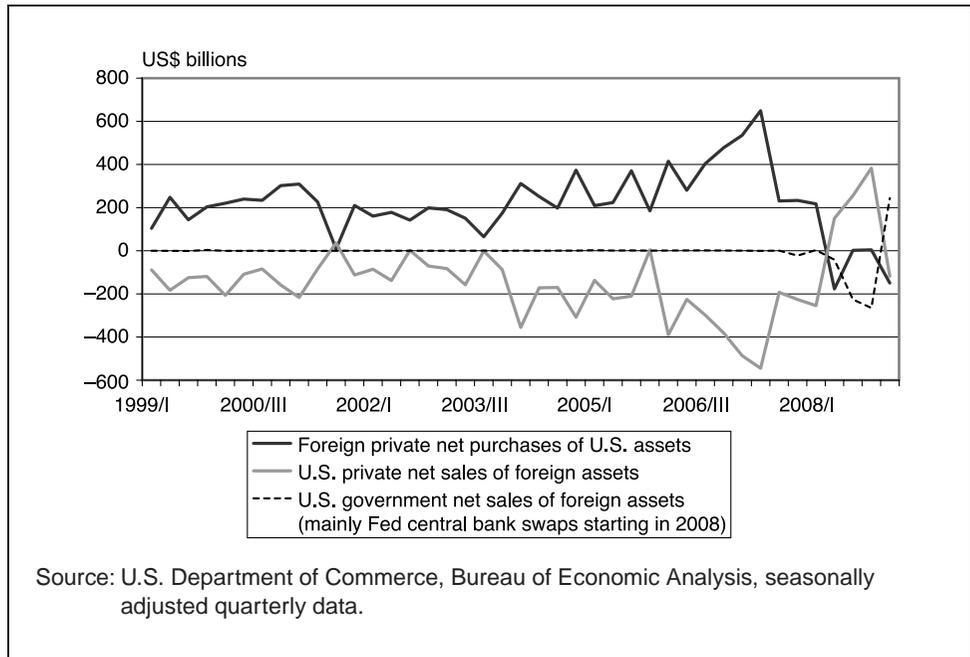
In general, the process of global deleveraging has led to a collapse of gross cross-border asset purchases (which in many cases became net sales), as illustrated for the U.S. financial account in Figure 5. This development has had particularly harsh consequences for some emerging markets. As the crisis has accelerated, countries have drawn dollar liquidity from a limited range of sources. Emerging markets as a group accumulated substantial foreign exchange reserves over the 2000s, as noted above (recall Figure 2), and several have deployed some of these hard-currency assets to finance financial outflows while moderating exchange depreciation.⁶ The IMF, having downsized itself as a result of the low global demand for crisis lending during much of the 2000s, has more recently been doing a brisk business lending to an expanding list of countries ranging from Iceland to Pakistan.

These actions underscore the emergence in August 2007 of a global shortage of hard currency—in most cases, dollar—liquidity. This shortage is connected with several episodes of dollar appreciation during the recent months of financial turbulence and, in general, probably has buoyed the dollar in foreign exchange markets above the declining trend that I believe is warranted by the nonfinancial macroeconomic fundamentals of the world economy.

4. The Fed adopted swap arrangements involving foreign central banks and the Bank for International Settlements in 1962. These have remained in place, in some form, ever since. The U.S. Treasury has also operated swap facilities with foreign governments.

5. See Fender and Gyntelberg (2008).

6. See Obstfeld, Shambaugh, and Taylor (2009).

Figure 5 U.S. External Financial Flows through 2009/I

While comprehensive data are elusive, a significant factor behind the shortage appears to reside in the strong desire of European banks over the 2003–07 period to invest in dollar assets. From a level around US\$4 trillion in 2003, European banks' dollar assets had more than doubled by the first quarter of 2007.⁷ U.S. banks held far fewer assets denominated in European currencies, and so were less vulnerable to a seizure in foreign currency liquidity than were European banks to corresponding problems obtaining dollar liquidity. To hedge their long positions in dollars, European banks drew short-term dollar funding from the interbank market and also borrowed nondollar currencies, swapping these funds into dollars on a short-term basis. U.S. money market funds also entered the business of lending short-term dollars to European banks.⁸

Much of the surge in European banks' acquisitions of dollar assets was motivated by the attractiveness of the AAA-rated tranches of securitized assets such as subprime mortgage pools. As is now well understood, the high credit ratings of these structured products had their basis in low *expected* loss, but ignored the significant systematic risk the products carried due to the likelihood that they would default in and only in states of the world where financial markets were deteriorating globally. For that reason, assets such as the AAA tranches of collateralized debt obligations offered relatively high returns; but even so, they may have been overpriced relative to the predictions of standard credit-risk models.⁹ Why? Part of the reason is that these assets carried an

7. See Baba, McCauley, and Ramaswamy (2009, p. 66).

8. See McGuire and von Peter (2009).

9. Coval, Jurek, and Stafford (2007) evaluate market prices of structured products and argue that investors placed excessive weight on the ratings agencies' assessments of their safety.

important collateral benefit. By adding them to their balance sheets, banks were able to reduce the required regulatory capital ratio under the Basel II standards. In other words, European banks' desire for highly rated, dollar-denominated structured products was driven not only by the search for yield—not adjusted for risk, of course—but also by regulatory arbitrage allowing greater leverage (Acharya and Schnabl [2009]). Why did investors not pay more attention to the risks? One answer is the short-termism often induced by financial-sector compensation practices. A second is that it is *precisely* in “systemic” states of the world that the authorities are expected to intervene in force—as they indeed have—to support markets and large financial institutions.¹⁰

As noted above, European banks funded purchases of U.S. assets through various forms of short-term dollar borrowing, making them highly vulnerable to any reduced availability of dollar liquidity. These factors helped fuel the pre-2008 surge in U.S. gross external asset flows illustrated in Figure 5. Dollar funding risk became a painful reality in August 2007, and the problems deepened after September 2008. Not only did interbank markets freeze; in addition, foreign exchange swap markets became illiquid, while U.S. money market funds faced a run in the fall of 2008 and retracted their foreign dollar lending.¹¹ A further exacerbating factor was central bank withdrawals during 2007–08 of dollar reserves that had been placed in commercial banks.¹² At the same time that banks faced funding illiquidity, they faced market illiquidity due to the difficulty of disposing of now-toxic assets. As McGuire and von Peter (2009, p. 58) put it:

The frequency of rollovers required to support European banks' US dollar investments in non-banks thus became difficult to maintain as suppliers of funds withdrew from the market. The effective holding period of assets lengthened just as the maturity of funding shortened. This endogenous rise in maturity mismatch, difficult to hedge *ex ante*, generated the US dollar shortage.

Over the course of the crisis, the ECB has been in a position to easily provide euro liquidity, but not dollar liquidity, to its resident financial institutions. European institutions facing dollar funding difficulties, and with no recourse to the Fed's LLR facilities through U.S. affiliates, had to sell euros for dollars on the foreign exchange market, the result of these aggregate sales being upward pressure on the dollar and a relatively weaker euro. To address this problem—one which the ECB apparently denied for some months¹³—the central bank swap arrangements for dollars were set up starting in December 2007. Under these facilities, the ECB (for example) received

10. This factor tends to induce financial-sector concentration by giving an implicit subsidy to scale (Solow [1982, p. 242]); in turn, concentration increases risk taking by systemically significant players and makes crises more likely.

11. On spillovers to the foreign exchange markets see Baba, Packer, and Nagano (2008), Baba and Packer (2008), and Genberg *et al.* (2009). These authors document how a rise in counterparty risk among European banks led to deviations from covered interest parity. McAndrews (2009) argues that Fed swap lines with other central banks helped narrow spreads between Libor and the federal funds rate, while Baba and Packer (2008) argue that the swap lines helped to lower the volatility of deviations from covered interest parity. Taylor and Williams (2009) doubt the effectiveness of Fed interventions. On the plight of the money market funds, see Baba, McCauley, and Ramaswamy (2009).

12. See McGuire and von Peter (2009, p. 57).

13. See Giles and Tett (2008).

dollars that it allocated to financial institutions, rebating interest earnings to the Fed. The Fed received a corresponding credit of euros that it agreed not to inject into markets and which offered no interest. Swaps were to be unwound at the initial exchange rate. In effect, therefore, the dollars were used to augment global dollar liquidity, whereas the swapped euros were immobilized.

In the current crisis, the Fed has played the role of a global LLR for dollars, just as it has played its more traditional role as LLR in its domestic markets. It has done so in part by subcontracting its LLR function (along with its monopoly on money creation) to a selected set of foreign central banks. It seems highly unlikely, for practical as well as political reasons, that this *ad hoc* scheme will be extended into any sort of large-scale permanent arrangement. For example, it is not desirable over the longer term for the Fed effectively to stand as an LLR for institutions over which it has no supervisory powers. Nor is it desirable for the Fed to allow institutions over which it could exert a salutary influence to evade its guidance by going to alternative official sources of dollar liquidity. An example of the type of problem that can arise is the allegation by Acharya and Backus (2009, p. 320) that by borrowing from the ECB rather than from the Fed between March and September 2008, Lehman Brothers was able to resist the Fed's advice to raise more capital.

Most likely, more limited swap facilities than those currently in place will be maintained into the future—as in the past—with the option (at the currency issuer's discretion) for greater flexibility in times of crisis. To the extent that nondollar currencies such as the euro and (eventually) the renminbi are potentially in short supply during financial breakdowns, there is a case for crisis-elastic sources of those currencies as well. Even the central banks and Treasuries of industrial countries may choose to accumulate larger stocks of liquid foreign currency reserves, easily available for lending during episodes of turbulence.

V. The World as a Single Financial System

The correct perspective nowadays is that the world economy comprises a single, interdependent financial system, one in which the emerging markets and the industrial countries are converging to comparable weights. While greater balance and interconnectedness may present enhanced opportunities for sharing risks, those same developments may well also raise the likelihood of systemic shocks, as the past two years have amply demonstrated.

Observers of emerging-market crises have long noted the “bank run” nature of sudden reversals in capital flows. Creditor panic can lead to sudden stops in capital inflows as well as refusal to roll over maturing short-term foreign debts. This possibility motivates the famous Guidotti-Greenspan prescription for international reserve adequacy, a liquidity buffer sufficient to handle maturing foreign debts over a year. But as the literature on “twin crises” shows, external financial instability is seldom decoupled from internal financial instability. Runs on the domestic banking system and into foreign exchange can deplete official reserves as the authorities intervene to limit excessive depreciation; reserve depletion, in turn, can make a panic by external creditors

more likely. Conversely, reserve depletion can raise fears of devaluation, leading to a run out of domestic banks.

These same bank-run dynamics have erupted in the industrial countries, playing a key role in the crises surrounding Long-Term Capital Management, Bear Stearns, and Lehman Brothers.¹⁴ Run dynamics become possible for nonbanks as well in the presence of maturity or currency mismatch, and can operate at the national level as well. In today's world economy, however, runs on large complex financial institutions and on emerging countries alike are likely to have substantial repercussion effects abroad through financial and ultimately trade linkages. This interdependence calls for a macroprudential systems approach to promoting global stability, as suggested in the domestic spheres by numerous authors, including Crockett (2000), Goodhart (2006), Morris and Shin (2008), Brunnermeier *et al.* (2009), and Turner (2009).

This approach argues that measures such as minimum capital-asset ratios designed to protect the solvency of an individual institution may destabilize the system as a whole in situations of generalized panic. In the worst case, propagation mechanisms such as fire-sale dynamics can transform more localized disturbances into generalized panics, in which standard hedging mechanisms such as credit default swaps or forward foreign exchange contracts break down because of counterparty failure.¹⁵

Naturally enough, these insights apply to the global system. Consider, for example, the prescription that countries enhance their liquidity by holding ample foreign currency reserves. If emerging markets as a group withdraw reserves placed with European banks and these ultimately find their way into U.S. Treasury securities, however, an emerging market crisis may be propagated to European financial markets and beyond. Placements of reserves as well as withdrawals can affect financial stability, for example, by depressing risk premiums on various debt instruments and appreciating the reserve currency. Pure portfolio shifts by large reserve holders can likewise cause liquidity reallocations or asset-price movements with systemic implications. To think that the international *system* will necessarily be more stable simply because all countries hold more foreign currency reserves is to subscribe to a fallacy of composition.

International reserves provide inside but not outside liquidity (in the sense described by Holmström and Tirole [2008]), whereas resources provided by an LLR constitute true outside liquidity. Large reserve holdings may stabilize the individual country, but possibly do so at some cost in terms of global stability. Reserve drawings by one country may negatively affect another, so at least in one respect, use of owned reserves is inferior to the availability of an LLR. The theme that the international reserve regime is subject to strategic complementarities and coordination problems is an old one—as shown by analyses of the gold standard's role in the interwar period and the Triffin confidence problem under the Bretton Woods system. It now underpins concerns about portfolio decisions by large U.S. dollar reserve holders such as China.

If one accepts the necessity for international LLRs, I think it is hard to escape the conclusion that LLR powers are most efficiently vested in a centralized agency that both supervises financial markets on a consolidated basis and can internalize other external

14. See Morris and Shin (2008), Gorton (2009), and many others.

15. Some of these mechanisms also are familiar from emerging-market crises. See, for example, Calvo (2005).

effects that arise from the national exercise of the LLR function.¹⁶ Furthermore, the LLR would need to be backed up by a global fiscal authority that can provide real resources for financial restructuring in cases where liquidity problems presage insolvency.¹⁷

This first-best solution, however, is simply not in the cards in a world of sovereign nations managing separate national currencies. Witness the difficulty even the euro zone has had in centralizing supervision and organizing centralized fiscal backup for its LLR, the ECB. Given the political constraints, it is more realistic to think about how the present international LLR structure might be enhanced.

Central to the existing structure is the IMF, which plays a unique and increasingly important role. As Roubini and Setser (2004, p. 338) put it:

The most important tool [for crisis response] remains the IMF's capacity to provide emerging economies with partial insurance against the risk of liquidity runs. Without the IMF, countries would have to hold more reserves, borrow much less, and impose more restrictions on domestic and external investors' ability to move capital freely across borders—and likely still experience crises. The IMF's institutionalized multilateral lending capacity avoids the need to organize an ad hoc coalition of the financially willing each time a crisis occurs.

The IMF lends to governments rather than directly to financial institutions, but this pathway for liquidity injection is analogous to the Fed's dollar loans to foreign central banks.

When a member country draws dollars from the IMF, the Fed creates those dollars, which therefore constitute an injection of new dollar liquidity into the world financial system. While the IMF cannot itself create outside liquidity *ad libitum*, funds that it borrows under the General or New Arrangements to Borrow could represent outside liquidity if financed by central bank money creation.¹⁸ Indeed, it is conceivable that IMF arrangements could evolve into central bank credit lines similar in effect to those extended by the Fed to the ECB and other central banks. (In the past, the Bank for International Settlements has had access to central bank credit facilities.) In February 2009, the government of Japan agreed to lend up to US\$100 billion to the IMF, and further such bilateral agreements are likely.

The IMF's structure will enable it to extend liquidity in multiple currencies as the world evolves away from dollar dominance toward a more multipolar system of several key currencies, including the dollar. Eventually, IMF assistance to richer countries might become more common than it has been in the past three decades—especially as countries now considered emerging converge to higher income levels. Indeed, the IMF could evolve into a truly global LLR, with access to individual central bank credit lines, thus institutionalizing the *ad hoc* methods that have been deployed in the current crisis.

16. Calvo (2009) advocates a global LLR and recommends that “the topic of financial regulation should be discussed *together* with the issue of a global lender of last resort.”

17. For an analysis of coordination failure in the sphere of bank recapitalization, see Goodhart and Schoemaker (2009). The scope for coordination failure in international supervision is only too well appreciated by now.

18. The potential for Special Drawing Rights (SDRs) as currently designed to contribute true outside liquidity is extremely limited.

The IMF's current inability freely to create outside liquidity does limit its power as an LLR. Moreover, because the IMF does not lend on the basis of collateral, its interventions depart even further from Bagehot's classical outline of the LLR function. Nonetheless, many countries will not be able to rely on the discretion of industrialized-country central banks for liquidity support, and in such cases the IMF is uniquely positioned to intervene. Fischer (1999) makes a convincing case that even the IMF's limited powers give it some scope to act as a global LLR.

Enhanced resources augment the IMF's effectiveness as a crisis lender. In addition, the IMF has been retooling its lending procedures to make them more flexible and automatic. Its general past practice of subjecting loans to sometimes unpredictable conditionality both slows the lending process and makes borrowers reluctant to approach the IMF—sometimes until they have no other choices. There have thus been attempts to streamline the process through some sort of pre-qualification criteria. Unfortunately, past initiatives along these lines have not succeeded.

The most recent attempt is the new Flexible Credit Line (FCL), under which countries judged by the IMF to have strong fundamentals and policies can pre-qualify for loans. In April 2009, the IMF's Executive Board approved a one-year US\$47 billion credit line for Mexico, intended by the Mexican government as a purely precautionary measure. Colombia and Poland also have signed up. These are hopeful developments, but true success will require emulation by more large emerging markets. Simultaneous enhancements to the IMF's stand-by arrangements likewise seek to ease access to liquidity support for countries that may not qualify for the FCL.

Fischer (1999) emphasizes that the IMF functions not just as a crisis lender, but also as a crisis manager—just as many central banks do. Effective crisis management can partially substitute for official liquidity provision.

Even a much bigger and more nimble IMF faces at least three major obstacles in effectively complementing the existing constellation of national LLRs:

Perceived political legitimacy. The IMF is governed by its Executive Board, whose members represent national governments. If IMF lending decisions are viewed as politically or ideologically motivated, however, countries will prefer to self-insure rather than approaching the IMF. Many Asian countries accumulated large holdings of international reserves after the late 1990s precisely to avoid having to borrow from the IMF. If the IMF is to be perceived as politically neutral in the exercise of its LLR function, a minimal requirement is a revision in Executive Board voting shares in favor of emerging-market members (as now seems likely to occur). A truly independent (yet accountable) IMF would be far better, but may be politically unattainable. A greater reliance on clearly formulated rules rather than discretion in lending would further promote a perception of political neutrality, while simultaneously moderating moral hazard (to be discussed further below). The IMF's exceptional access framework, put in place in 2003, was an early step in this direction.

Mechanisms to deal with insolvency. Fund resources are meant to address illiquidity rather than insolvency, although the line between the two conditions is very difficult to define, as we have seen. The problem is even more complex in the sovereign arena, where willingness rather than ability to pay is the issue and the constraints are

political as much as economic. Fund lending therefore needs to be supplemented by further progress in regularizing workout procedures that will sometimes mark down emerging-market debts at the expense of creditors. Such arrangements can be viewed as analogous, in the sovereign context, to resolution procedures for troubled financial institutions in the domestic context. Resolution requires an influx of real resources that ultimately must come from creditors or creditor-country taxpayers—and usually from both. Limited time prevents more discussion of these topics here, although Rogoff and Zettelmeyer (2002) and Roubini and Setser (2004) survey much of the copious literature.

Moral hazard. A bigger and more flexible IMF, coupled with the unprecedented monetary and fiscal interventions carried out by national financial authorities since August 2007, has made the prospect of moral hazard more problematic than ever in the past.¹⁹ This worrisome development greatly raises the marginal value of effective financial-sector supervision and regulation.

Again, a thorough discussion of the need for and feasibility of a new global regulatory regime would take me far beyond my time allocation. It seems doubtful to me that the IMF, with a governing body made up of political representatives, offers the best home for a centralized regulatory agency. No matter how the enhancement of global regulation is accomplished, though, the IMF should certainly have access to the fullest possible information on the vulnerabilities of its members' national financial systems and on the linkages among them. That information might allow the IMF's staff to predict more accurately the financial consequences of potentially unsustainable asset-price misalignments or flow imbalances in the world economy.

The IMF must confront moral hazard not only on the part of national regulatory agencies, but also on the part of other national decision makers. Adherence to lending rules as well as the use of rigorous pre-qualification criteria for certain credit facilities can help in principle. But the issue of credibility remains, and certain problems have no easy solutions. Will the IMF be willing to disqualify previously qualified countries, possibly provoking a crisis, if their policies or political climates change? Can some countries be too big to fail? Regulation can counteract concentration in the financial sector; it is harder to do anything about national size or interdependence levels. International regulatory cooperation is of some help in this regard—for example, through rules that effectively limit national exposures—but it is no panacea.²⁰

VI. Conclusion

In the new world economy, LLRs capable of supplying outside liquidity globally are more necessary than ever before. Within that group of lenders the IMF has a key role to play, although modifications in both the IMF's structure and in the global financial

19. Bagehot's demand for collateral that would be good under normal conditions can be viewed as one mechanism to limit moral hazard—one that is absent in the case of the IMF. The absence of collateralized IMF lending raises the further issue of fiscal support in case of IMF losses.

20. Recent essays on the IMF's role are collected in Truman (2006). Among the contributions most relevant to my discussion are chapter 14 (by William Cline), chapter 15 (by Gregor Irwin and Chris Salmon), and chapter 21 (by Michael Mussa).

architecture are necessary if the IMF's potential is to be realized. Given the growing interdependence of all countries, richer and poorer, many of these same reforms would be high on the financial stability agenda even if the IMF had never been created.

While LLRs play critical roles as a first line of defense in the face of global shocks, their longer-term powers are limited and at that point, fiscal authorities must step in. Moreover, the expansion in LLR resources seen in the current crisis raises the expectation that LLR intervention, backed by potentially large-scale fiscal support, will be deployed in the future. The resulting moral hazard is one of the most dangerous consequences of the policies followed since August 2007. The resulting need for global financial regulation cannot be fully addressed by individual countries working at the national level; it will require a greater degree of international coordination than in the past, and perhaps even a greater sacrifice of national sovereignty. Failure, however, will plant the seeds of the next global crisis.

References

- Acharya, Viral V., and David K. Backus, "Private Lessons for Public Banking: The Case for Conditionality in LOLR Facilities," in Viral V. Acharya and Matthew Richardson, eds. *Restoring Financial Stability: How to Repair a Failed System*, New York: John Wiley & Sons, 2009.
- , and Philipp Schnabl, "How Banks Played the Leverage Game," in Viral V. Acharya and Matthew Richardson, eds. *Restoring Financial Stability: How to Repair a Failed System*, New York: John Wiley & Sons, 2009.
- Alberola, Enrique, and José María Serena, "Sovereign External Assets and the Resilience of Global Imbalances," Documentos de Trabajo No. 0834, Banco de España, 2008.
- Baba, Naohiko, Robert N. McCauley, and Srichander Ramaswamy, "US Dollar Money Market Funds and Non-US Banks," *BIS Quarterly Review*, March, 2009, pp. 65–81.
- , and Frank Packer, "Interpreting Deviations from Covered Interest Parity during the Financial Market Turmoil of 2007-08," BIS Working Paper No. 267, Bank for International Settlements, 2008.
- , ———, and Teppei Nagano, "The Spillover of Money Market Turbulence to FX Swap and Cross-Currency Swap Markets," *BIS Quarterly Review*, March, 2008, pp. 73–86.
- Brunnermeier, Markus, Andrew Crockett, Charles Goodhart, Avinash D. Persaud, and Hyun Shin, *The Fundamental Principles of Financial Regulation*, Geneva Reports on the World Economy 11, Geneva and London: International Center for Monetary and Banking Studies and Centre for Economic Policy Research, 2009.
- Calvo, Guillermo A., "Capital Market Contagion and Recession: An Explanation of the Russian Virus," in *Emerging Capital Markets in Turmoil*, Cambridge, Massachusetts: The MIT Press, 2005.
- , "Lender of Last Resort: Put It on the Agenda!" *Vox*, March 23, 2009 (available at <http://www.voxeu.org/index.php?q=node/3327>, accessed June 24, 2009).
- Committee on the Global Financial System, *Capital Flows and Emerging Market Economies*, CGFS Paper No. 33, Bank for International Settlements, 2009.
- Coval, Joshua D., Jakub W. Jurek, and Erik Stafford, "Economic Catastrophe Bonds," Working Paper No. 07-102, Harvard Business School, 2007.
- Crockett, Andrew D., "Marrying the Micro- and Macro-Prudential Dimensions of Financial Stability," remarks before the Eleventh International Conference of Banking Supervisors, Basel, September 20–21, 2000 (available at <http://www.bis.org/speeches/sp000921.htm>, accessed May 21, 2009).
- Fender, Ingo, and Jacob Gyntelberg, "Overview: Global Financial Crisis Spurs Unprecedented Policy Actions," *BIS Quarterly Review*, December, 2008, pp. 1–24.
- Fischer, Stanley, "On the Need for an International Lender of Last Resort," *Journal of Economic Perspectives*, 13, Fall 1999, pp. 85–104.
- Genberg, Hans, Cho-Hoi Hui, Alfred Wong, and Tsz-Kin Chung, "The Link between FX Swaps and Currency Strength during the Credit Crisis of 2007–2008," mimeo, Research Department, Hong Kong Monetary Authority, 2009.
- Giles, Chris, and Gillian Tett, "Three Wiser Men," *Financial Times*, February 12, 2008 (available at http://www.ft.com/cms/s/0/3e511c26-d90d-11dc-8b22-0000779fd2ac.html?nclck_check=1, accessed May 21, 2009).

- Goodhart, Charles A. E., "A Framework for Assessing Financial Stability?" *Journal of Banking and Finance*, 30, 2006, pp. 3415–3422.
- , and Dirk Schoenmaker, "Fiscal Burden Sharing in Cross-Border Banking Crises," *International Journal of Central Banking*, 5, March, 2009, pp. 141–165.
- Gorton, Gary, "Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007," paper presented at the Federal Reserve Bank of Atlanta's 2009 Financial Markets Conference, mimeo, Yale University, 2009.
- Guttentag, Jack, and Richard Herring, *The Lender-of-Last-Resort Function in an International Context*, Essays in International Finance No. 151, Princeton: International Finance Section, Department of Economics, Princeton University, 1983.
- Holmström, Bengt, and Jean Tirole, *Wicksell Lectures: Inside and Outside Liquidity*, mimeo, Massachusetts Institute of Technology and Toulouse School of Economics, 2008.
- Kaminsky, Graciela, and Sergio L. Schmukler, "Short-Run Pain, Long-Run Gain: Financial Liberalization and Stock Market Cycles," *Review of Finance*, 12, April, 2008, pp. 253–292.
- Kindleberger, Charles P., *The World in Depression, 1929–1939*, revised and expanded edition, Berkeley: University of California Press, 1986.
- McAndrews, James J., "Segmentation in the U.S. Dollar Money Markets during the Financial Crisis," mimeo, Federal Reserve Bank of New York, 2009.
- McGuire, Patrick, and Goetz von Peter, "The US Dollar Shortage in Global Banking," *BIS Quarterly Review*, March, 2009, pp. 47–63.
- Morris, Stephen, and Hyun Song Shin, "Financial Regulation in a System Context," *Brookings Papers on Economic Activity*, Fall, 2008, pp. 229–261.
- Obstfeld, Maurice, Jay C. Shambaugh, and Alan M. Taylor, "Financial Instability, Reserves, and Central Bank Swap Lines in the Panic of 2008," *American Economic Review Papers and Proceedings*, 99, May, 2009, pp. 480–486.
- Rogoff, Kenneth, and Jeromin Zettelmeyer, "Bankruptcy Procedures for Sovereigns: A History of Ideas, 1976–2001," *IMF Staff Papers*, 49, September, 2002, pp. 470–507.
- Roubini, Nouriel, and Brad Setser, *Bailouts or Bail-Ins? Responding to Financial Crises in Emerging Economies*, Washington, D.C.: Institute for International Economics, 2004.
- Solow, Robert M., "On the Lender of Last Resort," in Charles P. Kindleberger and Jean-Pierre Laffargue, eds. *Financial Crises: Theory, History, and Policy*, Cambridge: Cambridge University Press, 1982.
- Taylor, John B., and John C. Williams, "A Black Swan in the Money Market," *American Economic Journal: Macroeconomics*, 1, 2009, pp. 58–83.
- Truman, Edwin M., ed. *Reforming the IMF for the 21st Century*, Special Report 19, Washington, D.C.: Institute for International Economics, 2006.
- Turner, J. A., *The Turner Review: A Regulatory Response to the Global Banking Crisis*, London: Financial Services Authority, 2009.