GUILLERMO A. CALVO

Presidential Address

Globalization Hazard and Delayed Reform in Emerging Markets

Capital inflows to emerging market economies rose to unprecedented heights in the first part of the 1990s and then collapsed very rapidly in the second. Such volatility could partly be explained by financial vulnerability in the emerging markets themselves, but the global nature of the phenomenon raises the suspicion that the world financial market is wrought with systemic problems that are largely independent of the individual countries affected. This paper puts forward the conjecture that phenomena such as contagion could stem from the way the capital market operates (for example, crises generated by margin calls). These systemic phenomena require systemic instruments. Unfortunately, few are available. The International Monetary Fund (IMF) operates more like a fire department than like a central bank. Liquidity is sprayed where fire is found, not on the system as a whole in the manner of a central bank faced with a liquidity crisis.[1]

The combination of domestic financial vulnerability and the lack of a worldwide safety net gives rise to what I call globalization hazard, that is, risk generated by the sudden large expansion of credit to emerging market economies in the first half of the 1990s, probably as a result of imperfect information and underdeveloped financial institutions. Several recent financial crises were low-probability events that were uninsured and

Calvo is with the Inter-American Development Bank and the University of Maryland. He was president of the Latin American and Carribbean Economic Association, 2000–01.

This version of the paper has greatly benefited from incisive and exhaustive comments by Allan Meltzer, Enrique Mendoza, and Andrés Velasco. I would also like to acknowledge useful comments by Ricardo Caballero, Sara Calvo, Ricardo Hausmann, Alejandro Izquierdo, Luis Fernando Mejía, and Guillermo Mondino. To all of them, my heartfelt thanks, as well as my apologies for not having heeded all their good advice.

1. The IMF's contingent credit line (CCL) is, in fact, an attempt to prevent fires—not quite a central bank, but at least a fire department that is trying to increase the available water supply in case of fire.

perhaps uninsurable in the private sector, and they called for ex post government intervention. Government intervention, however, represents a major roadblock in the presence of delayed reform, a condition in which the government delays the implementation of socially desirable reform and wealth redistribution. Delayed reform may thus exacerbate the impact of low-probability events and possibly help to coordinate expectations on "bad" equilibria, contributing to the severity of globalization hazard.

The policy implications of the globalization hazard view are diametrically opposed to those of the moral hazard view recently popularized by Meltzer.[2] This makes the present discussion greatly relevant for the design of a new financial architecture, an issue of enormous urgency and importance.

Moral Hazard versus Globalization Hazard

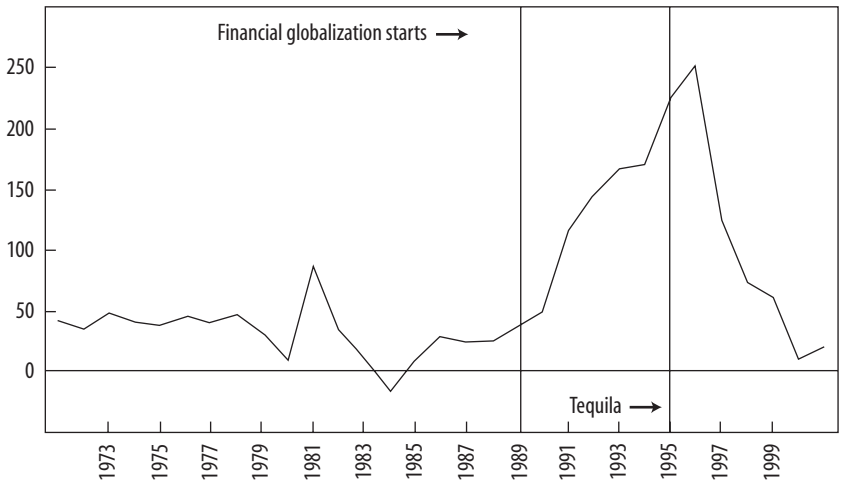
A salient characteristic of currency crises after the 1994 Mexican crisis (the so-called tequila crisis) is their frequent recurrence. The tequila crisis was followed by massive crises in Asia (1997), Russia (1998), Ecuador (2000), and Turkey (2001), as well as the protracted crisis in Argentina (2000–02). With the exception of Argentina, these crises have been relatively short-lived, especially compared to the debt crisis in the 1980s. However, they followed each other domino fashion. Why?

A leading explanation is moral hazard. According to this point of view, large and timely bailout packages, orchestrated by the IMF, allowed fixed-income investors to exit the market following the occurrence of each crisis without suffering major capital losses, even though the rate of return on these assets far exceeded those of safe assets like U.S. Treasury bills. The expectation that future crises would be resolved in the same manner emboldened fixed-income investors to take high risks in other emerging market economies, thereby increasing the probability of a crisis. Plausible as it sounds, however, this view has slim empirical support. In the first place, as shown in figure 1, net private capital flows to emerging markets started to subside after 1995, a trend that is even sharper for portfolio flows (see figure 2).[3] Second, after the tequila crisis the composition

2. Meltzer (2000).

3. Some supporters of the moral hazard view claim that the decline of capital flows to emerging market countries is the result of Russia not getting a bailout package in 1998,

FIGURE 1. Net Private Capital Flows to Emerging Markets, 1971–2001



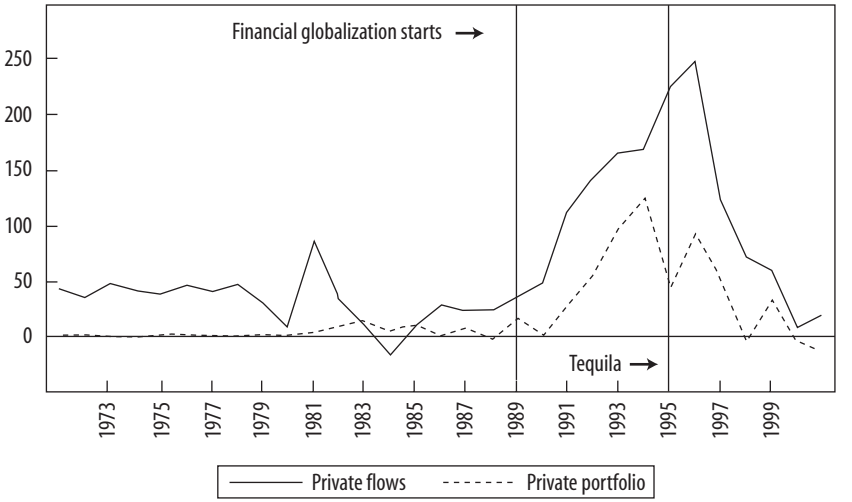
Source: IMF (2001).

of capital flows shifted in favor of foreign direct investment (FDI) (see figure 3). Investors in those and related assets (stocks) suffered major losses during crises and thus cannot easily be claimed to have greatly benefited from bailout packages.

Questioning the moral hazard view is not tantamount to saying that policymakers and investors will not take advantage of generous giveaways, but the existence of distortion-driven behavior does not prove that distortions are seriously costly. The moral hazard view claims that bailouts by the Group of Seven (G-7) countries are a major cause of both the succession of crises and their high cost. To uphold this view, one has to be able to argue, among other things, that moral hazard led to the large output and employment losses suffered during the crises. At equilibrium, this would imply either that emerging market policymakers deliberately

which supposedly made investment in emerging market securities less attractive. However, flows started to decline prior to that (in 1997; see figure 1), and Brazil got a large bailout package soon after the Russian crises, followed by equally large packages for Argentina and Turkey in 2001.

FIGURE 2. Net Private Portfolio and Total Capital Flows to Emerging Markets, 1971–2001



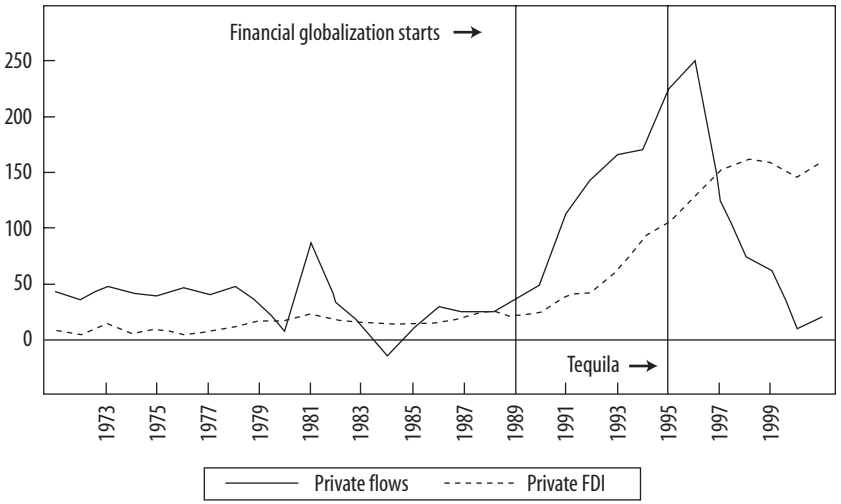
Source: IMF (2001).

brought their economies into a painful maelstrom (in exchange, perhaps, for a brief affluence mirage) or that they exhibited a fantastic lack of judgment, bordering on the insane. Since there is no scientific evidence that those characteristics are the monopoly of emerging market policymakers, however, and given that the empirical evidence reviewed above is not supportive, the moral hazard view must be classified, at least momentarily, as an intellectually appealing but unsubstantiated conjecture.

An alternative hypothesis is that the recent crises are the result of the surge in capital flows to emerging markets in the early 1990s, their subsequent decline, and their volatility. Neither 20-20 vision nor sophisticated econometrics is needed for one to realize from figure 1 that something truly extraordinary happened after 1989. In 1996, for example, net private capital flows to emerging market economies were about ten times as large as their average in the period 1970–89. This sharp climb took place in the span of a few years, and it was followed by an equally swift reversal. The result was major economic disruption.

By definition, and abstracting from errors and omissions, the following accounting identity holds:

FIGURE 3. Private Foreign Direct Investment and Total Capital Flows to Emerging Markets, 1971–2001



Source: IMF (2001).

$$\text{Capital inflows} = \text{Current account deficit} + \text{Accumulation of international reserves.}$$

Sharp fluctuations in capital inflows thus result in equally sharp fluctuations in current account deficits and reserve accumulation. Both could give rise to serious difficulties, the former because it brings about sharp, possibly unanticipated changes in aggregate demand, and the latter because international reserves are still perceived as an indicator of financial health. A sizable fall in international reserves, for example, is commonly seen as a harbinger of serious financial trouble in the official sector. The mere fact that capital flows exhibit large fluctuations suggests that at least part of the problem may reside in the new features of the capital market after 1989.

One can get a better sense of the importance of capital flow fluctuations by examining capital flow reversals (that is, the drop in capital inflows) during crises. This is illustrated in table 1, which shows the reversals to have been sizable. Thailand, one of the Asian Tigers, holds the record in the table, with a reversal equivalent to 26 percent of gross domestic prod-

TABLE 1. Sudden Stop of Capital Inflows

Country	*Episode*	*Reversal of capital inflows (percent of GDP)*
Argentina	1982–83	20
Ecuador	1995–96	19
Korea	1996–97	11
Mexico	1981–83	12
Thailand	1996–97	26
Turkey	1993–94	10

Source: Calvo and Reinhart (2000).

uct (GDP). This is quite remarkable given the long period of growth enjoyed by its economy prior to the crisis. Moreover, these magnitudes are unheard of in advanced countries. Table 2 illustrates the difference between emerging markets and advanced countries around crisis periods, focusing on changes in the current account deficit.[4] In the table, T denotes the year the crisis takes place, $T - 1$ is the year before, and $T + 1$ the year after. "Change" corresponds to the difference between the current account in $T + 1$ and $T - 1$. Two points are worth making. First, change in advanced countries is insignificant compared to that in emerging market economies. In emerging markets, the average current account adjustment corresponds to a sizable 3.5 percent of GDP, whereas the adjustment in advanced countries represents less than 1 percent. Second, during periods of crisis, that is, T, the current account deficit contracts in emerging markets, while it shows a slight increase in advanced countries. Thus the overall flow credit to emerging markets declines during crises, while that of advanced countries increases. This observation, incidentally, suggests that emerging market crises contain a credit contraction element that is, on the whole, absent in advanced countries.

Where was the public sector during the financial globalization episode that started in 1989? As shown in figure 4, all the action took place in the private sector. Official flows were essentially flat throughout the period 1971–2001.

This evidence leaves little doubt that the phenomenon in question is unprecedented in recent history, and it is associated with the globalization of finance. The private sector initiated a large increase in the flow of savings from advanced to emerging market economies, and the invest-

4. For further details, see Calvo and Reinhart (2001).

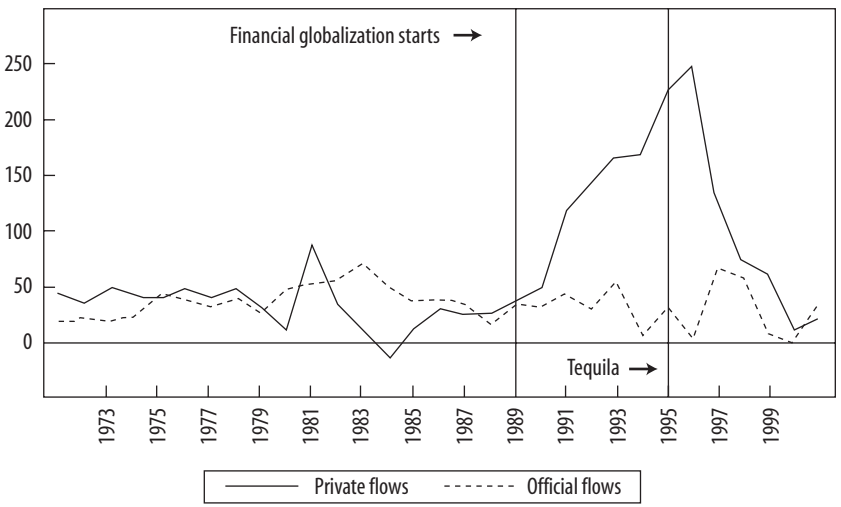
TABLE 2. Change in Current Account
Share of GDP

Country group	*T – 1*	*T*	*T + 1*	*Change*
Emerging markets	–4.86	–3.97	–1.39	3.47
Advanced economies	–2.84	–3.06	–2.10	0.74
Difference	–2.02	–0.91	0.71	2.73*

Source: Calvo and Reinhart (2001).
* Statistically significant at the 5 percent level.

ments were protected by a flimsy official safety net. A plausible conjecture, then, is that financial globalization may bear the seeds of its own fragility, a phenomenon that I call globalization hazard. The sheer size and unprecedented nature of the flows could be the simple explanation. For example, temporary flows could have been mistaken for permanent flows. As a result, investment projects that were undertaken with the expectation that the relative prices prevailing during the boom would be permanent became unsustainable under the relative prices that prevailed as the capital flows subsided. The term globalization hazard is thus justified, as it suggests that this is a case of market failure, not moral failure—a case in which the

FIGURE 4. Net Private Foreign and Public Capital Flows to Emerging Markets, 1971–2001



Source: IMF (2001).

market suffers from too little, instead of too much, protection and harnessing. As shown in the figure, the public sector did little to offset the collapse of private sector flows after 1996. This lack of response could indicate that what the world needs is a central bank of global dimensions coupled with more, not less, global financial cooperation.

Globalization Hazard: A Closer Look

Establishing the globalization hazard view as a serious alternative to the moral hazard view requires presenting non-moral-hazard arguments for the surge, decline, and volatility of capital flows to emerging market economies, including the so-called sudden stop phenomenon highlighted above (that is, the sharp drops in capital flows shown in table 1). In that respect, my conjecture is that the key factors accounting for globalization hazard are institutional and informational, both in the global capital market and in the emerging markets.

An example of an institutional factor at the global level is the development in the early 1990s of the market for Brady bonds, which increased investors' incentives to collect information on emerging market economies and led to the development of the bond markets of emerging market economies.[5] Examples of institutional factors at the local level of the emerging markets themselves include a weak local financial sector (such as weak banks initially controlled by the public sector) and liability dollarization (that is, the denomination of external debt in terms of foreign exchange).[6] The latter places severe bounds on exchange rate policy, and it is one possible explanation for what has been termed the fear of floating in emerging market economies, that is, a reluctance to let the exchange rate fluctuate as freely as in advanced countries.[7] When fear of floating is combined with an underdeveloped local financial system, it gives rise to an economy that is highly vulnerable to shocks. The existence of limited monetary policy instruments and rigid financial institutions (such as limited access to state-contingent financial contracts) could be deadly. In that context, downward price and wage flexibility may prove to be the only

5. Calvo (2001).

6. See Calvo (2001); Hausmann, Stein, and Panizza (2001).

7. See Calvo and Reinhart (2002). Liability dollarization could reflect institutional factors in both global and domestic capital markets; see Caballero and Krishnamurthy (2001b) and Jeanne (2001).

available adjustment mechanism short of bankruptcy and financial disruption. Price and wage flexibility could be harmful, however, if not supported by state-contingent financial contracts.

This point was highlighted long ago by Irving Fisher.[8] To illustrate the Fisher effect, take the case in which loans specify a constant stream of nominal interest payments. A sharp, unanticipated fall in prices and wages would result in an equally sharp increase in the ex post real interest rate, as well as a possibly large contraction in the capital of borrowing firms. A direct and obvious effect of downward price and wage flexibility would be a higher incidence of bankruptcies, which, under imperfect information, could give rise to negative spillover effects, such as through the interfirm credit network.[9] Another channel (not emphasized by Fisher) is that the resulting decapitalization of indebted firms, associated with an unanticipated ex post rise in real interest rates, lowers those firms' collateral and may trigger a strong credit reversal, such as a cut in indebted firms' credit lines.[10] If credit to firms goes partly to finance working capital, then a credit reversal could result in a sudden drainage of funds available to pay for labor services and raw material. The Fisher effect (which Fisher called debt deflation) will be especially strong for highly indebted economies. In the context of the recent crises, emerging market economies may have become much more vulnerable to negative shocks after the 1989–95 capital flows.

Why should emerging market economies be more vulnerable than advanced countries? This is a key question because all of the above considerations should, in principle, also be applicable to advanced economies. A plausible conjecture is that institutional changes around the start of the 1990s gave rise to a stock reallocation of loanable funds, which, by its nature, was bound to be transitory. Policymakers attributed the larger flows to good domestic policies, an opinion that was shared in report after report by the Washington establishment. Several emerging market economies were depicted as being on the road to joining the first world as a result of having heeded the Washington Consensus. Many individual investors may have been led to believe that the capital inflow episode had a large

8. Fisher (1933). See also Keynes ([1931] 1963), who appears to have anticipated Fisher's ideas on this subject.

9. See Calvo (2000a).

10. This effect is studied in Kiyotaki and Moore (1997); Izquierdo (2000); Caballero and Krishnamurthy (2001b); Céspedes, Chang, and Velasco (2001).

permanent component—larger than a more balanced analysis would have found.[11] Wall Street establishments, on the other hand, may have joined the bandwagon because they shared the opinion of the Washington Consensus—and perhaps also for moral hazard considerations: seeing the blind support that the emerging markets received from Washington, they may have softened their lending stance in the expectation that Washington would send timely rescue teams if trouble arose.[12]

From this perspective, the tequila episode becomes the tip of the iceberg. The market had made wrong investment decisions, and it was bound to go through a correction. Given the policy and market rigidities highlighted above, the adjustment was abrupt in Mexico and Argentina (a sudden stop), and it gave rise to suspicions that the market may have been operating under false expectations. At first, the problems were confined to Argentina and Mexico, and funds emigrated to other emerging market economies. However, the Asian crisis of 1997 started a sharp contraction for emerging markets as a whole (see figure 1).

Prima facie, the Russian crisis of 1998 appears to be the best case for the moral hazard argument. Russia was loaded with nuclear weapons, making it too dangerous to fall and perhaps leading investors to take higher risks in the expectation that the IMF would bail them out. However, the IMF funds to Russia were not sufficient to prevent default on domestic public debt, part of which was held directly or indirectly abroad. The default took Wall Street by surprise and reportedly caused a serious liquidity crunch, together with a consequent liquidation of emerging market securities. This, it could be argued, generated rational confusion in the market. Informed investors sold emerging market securities to uninformed investors, depressing their price below their fundamental levels. All emerging market economies were affected, which indicates that emerging market securities, as an asset class, were more risky than previously thought. The demand for emerging market securities shrunk as a result,

11. See Calvo, Leiderman, and Reinhart (1993).

12. I would not place a lot of weight on this conjecture. First, the world was extricating itself from the1980s debt problem, for which Washington had taken a good number of years to find an effective cure. Second, debt difficulties were significantly more complicated to negotiate in the 1990s than in the 1980s, given that there was a myriad of lenders (such as bond holders), as opposed to a handful of large banks holding the bulk of the loans extended to the countries in trouble.

putting further downward pressure on capital flows to those countries.[13] The shock can thus be seen as a sort of reverse-moral-hazard effect—in that the bailout was smaller than expected—that was magnified by confusion and imperfect information in the capital market.

Even if it is true that investors' mood reversals are similar across all economies, they are likely to have a larger impact on emerging market economies than on advanced countries, owing to differences in information and institutions. In the case of the former, for example, financial globalization could lead investors to invest in securities about which they have very limited information.[14] This may be especially true for emerging market securities, which, by their nature, do not have a long or reliable track record. These securities are highly susceptible to rumors: a negative rumor, for example, could drive investors to chuck them out of their portfolios almost entirely.[15]

Finally, a formal model of globalization hazard might be defined in terms of a multiple-equilibrium model stemming from financial rigidities.[16] Increased financial flexibility (that is, the existence of a wide array of state-contingent financial transactions) could help to eliminate bad equilibria, thereby avoiding a major collapse. Arguably, a salient feature of emerging markets is financial inflexibility. This kind of model thus helps to rationalize the view that emerging markets are more vulnerable to shocks than are financially mature markets, even in the absence of the perception errors referred to above.[17]

In short, my answer to the question of why emerging market economies were more vulnerable centers on two factors: overly optimistic (though not necessarily irrational) expectations during the capital inflow period, kicked off by structural change in the global capital market, and relatively poor information about emerging market economies, including political condi-

13. For further discussion, see Calvo (2001) and Guillermo Calvo, "Understanding the Russian Virus, with Special Reference to Latin America," (www.bsos.umd.edu/econ/ciecalvo.htm [October 1998]).

14. This discussion takes its lead from Calvo (1998b) and Calvo and Mendoza (2000a, 2000b).

15. See Calvo (1998a) for a simple example in which a sudden stop caused by rumors could bring about an output loss.

16. See, for example, Calvo (1998b).

17. The existence of equilibrium multiplicity is not a necessary condition for generating a severe crisis, whereas financial frictions appear to be essential. For a recent rational expectations dynamic model of this sort, see Mendoza and Smith (2001).

tions. Informational and institutional problems also help explain the severity of the crises.

Why do crises recur? This question has implicitly been answered above. The crises themselves, including their systemic nature, increased the perception of risk on the part of investors. This resulted in a lower demand for emerging market securities and higher interest rate spreads, which increased the probability of crisis and thus its recent recurrence. One implication of this analysis is that crisis recurrence may slow down once investors reach their new steady-state portfolio allocation.

If this were the whole story, then episodes like those of the 1990s would be unlikely to be repeated in the near future. One hopes that investors have learned their lesson and that their memories are not too short. However, some emerging market economies (particularly in Latin America) suffer from a serious case of what I call delayed reform, a condition in which government delays the implementation of socially desirable reform or wealth redistribution. This condition may give rise to future episodes of excessive borrowing and financial turmoil. I return to this topic later in the paper, after exploring the role of global policy in the next two sections.

Global Policies after Crisis

Emerging market financial crises have a negative impact on growth and income distribution. Consequently, there is a general consensus that something has to be done about them. This section discusses global policies, that is, policies that can primarily be implemented by advanced G-7 countries when a crisis hits one or several emerging markets. The welfare justification for these kinds of policies is taken up in the next section.

Global policies require multilateral institutions. The institutions exist, but unfortunately their size has shrunk relative to potential global capital flows (recall figure 4). Their effectiveness has thus become questionable. Recent bailout packages required the collaboration of several of these institutions, as well as bilateral aid and, as in the case of Ecuador, private sector involvement. The sums were large, but the procedures were clumsy and far from transparent or automatic. The world has reached for policies on an ad hoc basis; nothing predictable or systematic has been established. The popularity of the moral hazard view leads me to suspect that multilateral institutions will be slow to respond to crises in the future, and pri-

vate sector involvement will rule the day. In what follows, I briefly comment on the role of private sector involvement and discuss the creation of an emerging market fund to prevent financial contagion.

Private Sector Involvement

The idea behind private sector involvement is straightforward, namely, to make the private sector (creditors, mostly) play an active role in solving financial difficulties. If left to its own devices, the private sector is unlikely to help solve solvency problems unless creditors are compelled to cooperate among themselves.[18] Otherwise, it will be hard to achieve a solution. It is always optimal for a creditor to claim 100 percent of what is owed to it after all the other creditors have negotiated a cut in debt obligations to prevent bankruptcy. This may be a serious problem in the present circumstances, given the large share of bonds in total emerging market debt.[19] Private sector involvement would still be effective for handling liquidity problems, however, because these could be solved by debt swaps that do not necessarily lower (and may actually increase) the present discounted value of debt (as in the case of Argentina's 2001 debt swap).

Private Sector Involvement plus Guarantees from International Financial Institutions

Loans from multilateral institutions are senior to other credit obligations. A bond issued under that kind of guarantee, for example, is de facto senior to the other obligations. Suppose the debtor country declares a cessation of payments. This triggers the loan guarantee, automatically making the country a debtor of the corresponding multilateral institution for the full amount of the guarantee. This type of guarantee thus serves as a roundabout way of endowing debt instruments with seniority. Senior instruments could be very effective in coordinating creditors in case of insolvency. To illustrate, let the stock of debt obligations be 100 units (of output, say), while the maximum amount that the country can and is willing to repay is 50 units. If the country offers to swap the entire outstanding debt for a new senior bond paying 50 units, then each unit of the senior debt would be swapped for 2 units of the old debt, which in other words

18. See, for example, Krugman (1992).

19. This constraint could be relaxed if a critical number of bondholders were able to modify some key clauses in the bond contract, as in the recent debt restructuring in Ecuador.

represents a discount of 50 percent over the old debt. In addition, the government announces that if less than 50 units of the new senior bond are issued in the swap (which would happen if some creditors did not want to participate in the swap), then the remainder will be offered in the open market. The government will thus issue 50 units of the new senior debt under all circumstances, be it as a result of the swap or through sales to new investors. Clearly, the market value of the new senior debt is 1 unit, because the government can repay 50 units with full certainty. Moreover, the market value of the old debt falls automatically to zero, since the debtor country would have no funds left over for repayment after servicing the new senior debt. Consequently, investors will have no incentive to keep the old debt, the swap will be successful, and solvency will be fully restored by means of market-friendly mechanisms.[20]

Emerging Market Fund

In each crisis episode, the crisis has spread to other emerging market economies. As noted above, a dominant explanation for this phenomenon is based on imperfect information. One way to attack this problem is to try to stabilize an emerging market index like the J.P. Morgan Emerging Markets Bond Index Plus (EMBI+). The idea is to stop contagion resulting from a financial crisis in an individual country by making a credible announcement that some global institution will stand ready to buy bonds from the other emerging markets in order to prevent a collapse in bond prices. This could be accomplished by setting up an emerging market fund (EMF) endowed with G-3 debt instruments (for example, G-3 Treasury bills). To illustrate, emerging market bonds listed in the J.P. Morgan EMBI+ (around U.S.$160 billion in 2001) are equivalent to about 3 percent of G-3 public debt (around U.S.$5 trillion in 2001).[21] If the EMF were to be endowed with 1 percent of G-3 public debt (around U.S.$50 billion), the fund's capital would represent around 30 percent of emerging market bonds (listed in the EMBI+). This significant backing of emerg-

20. A market-friendly mechanism does not break explicit contracts, although implicit contracts might be trounced. This is likely to be the case in debt restructuring during a crisis, as when some clauses in the bond contract are modified following strictly legal procedures. However, breaching implicit contracts could seriously impair the resumption of credit flows.

21. See J.P. Morgan, "Government Bond Index Monitor," (www2.jpmorgan.com/MarketDataInd/GovernBondIndex/Publications/bim.html [31 July 2001]).

ing market bonds involves a small risk for the G-3. The level of G-3 exposure is actually smaller than these numbers suggest because the EMF is intended only to forestall a total collapse in emerging market bond prices, not to prevent run-of-the-mill fluctuations. The EMF need only intervene in special circumstances, such as a price meltdown. It is not supposed to fight trends. For example, a meltdown could be defined as a situation in which the bond price index falls by more than x percent relative to a moving average. If prices do not recover from the initial x percent drop, the moving average will decline over time and the EMF will start selling emerging market bonds, reversing its portfolio back to G-3 bonds. If the initial price drop reflected a fundamental deterioration of emerging market fundamentals, then the EMF would eventually sell all its stock of emerging market bonds even though prices would have exhibited a substantial decline. On the other hand, if the EMF intervention is successful and prices recover, the EMF will quickly undo the initial intervention. In all cases, the EMF will converge to a situation in which its holdings of emerging market bonds would be negligible. If the large swings in emerging market bond prices are due to liquidity considerations, the EMF is likely to make a profit. The fund could incur a loss, however, by buying high and selling low. This occurs when the initial sell-off signals a permanent deterioration in emerging market fundamentals. The EMF would therefore have to decide on a case-by-case basis when it is appropriate to intervene.[22]

The EMF is a relative of the contingent credit line (CCL) recently created by the IMF. Both mechanisms pump liquidity into the market to prevent a liquidity crisis from triggering the deterioration of fundamentals and, possibly, insolvency. However, the CCL goes to the epicenter of the crisis, while the EMF aims at preventing contagion. Moreover, the EMF is less subject to the moral hazard criticism because it supports the asset class, rather than the bonds of an individual country. Finally, the EMF does not stigmatize emerging markets, whereas the CCL does. A key reason why the CCL has not yet gotten off the ground is that eligible countries feel that applying for such a facility would give a clear signal to the market that policymakers are worried about a possible sudden stop, for example.

22. Technical details are yet to be worked out. It is clear, however, that countries protected by the EMF should submit to new rules in order to prevent moral hazard, among other things.

Another close relative to the EMF is the Lerrick-Meltzer proposal that the IMF stand ready to buy all of a country's debt at a large discount.[23] Unlike the EMF, this proposal does not prevent liquidity-based contagion, and it is aimed at stopping a meltdown at the epicenter of the crisis.

A Rationale for Public Sector Involvement

The moral hazard view cautions against public sector involvement (recall the discussion above). Although empirical evidence does not support this view in the context of recent international financial crises, it would be hard to dismiss the argument that an indiscriminate and systematic bailout of loss-making investment projects will eventually induce undue risk taking by the private sector, thereby contributing to the recurrence of crisis episodes. However, this argument does not imply that every kind of bailout is bound to have negative consequences.

The issue discussed in this section is more general than the one at hand. It has to do with the advisability of public sector intervention ex post, that is, after the state of nature is revealed. In an ideal Arrow-Debreu setup with complete markets, there is no Pareto-improving ex post government intervention. This proposition is no longer true under incomplete markets, since government intervention could help to substitute for missing markets. For example, in an economy with two risk-averse farmers with uncorrelated outputs, it would be optimal for these farmers to write an ex ante insurance contract that redistributes output from the winner to the loser for each state of nature. This contract may not be feasible for a variety of reasons, in which case it would be optimal ex ante if the government could implement the corresponding transfers ex post. Winners will oppose the action ex post, so this type of transfer would have to be cloaked in a politically acceptable garment (such as a solidarity program). The optimal arrangement under these circumstances thus involves systematic bailouts, yet it need not give rise to moral hazard.

The relevance of this example could be criticized by noting that the same factors that prevent the emergence of markets or institutions for implementing the optimal insurance arrangement are also likely to impair the effectiveness of government intervention. For example, the state of

23. Lerrick and Meltzer (2001).

nature may be hard to observe or verify.[24] The farmers might thus prefer to live in isolation and suffer the vagaries of the weather rather than writing a contract that would be very difficult to verify. The government would face the same difficulties, and thus the net benefits of government intervention are no longer apparent. This type of consideration has led many modern policymakers to take the command "Thou shalt not intervene" as their guiding principle.

Although I would not quarrel with this guiding principle for regular situations, the principle may break down for states of nature that have low probability ex ante. Since observability is not at stake, I assume for the sake of the argument that these low-probability events are perfectly observable. Consider, once again, the case of the two farmers. Suppose that under catastrophic circumstances they are able to obtain information about output free of cost, while otherwise information costs are prohibitive. I also assume that catastrophic circumstances are low-probability events. Let $k > 0$ denote the output cost of writing a clause in the insurance contract that specifies the transfer received by the victim in a low-probability event. Clearly, if k is high enough or, more interestingly, if the probability of the event is low enough, it may not be optimal to include that type of clause in the insurance contract between the two farmers. Suppose the government is subject to the same cost k if the transfer is executed ex post. Ex post government intervention clearly has a smaller ex ante cost, because it will be incurred only if conditions are catastrophic. To make this point even more obvious, notice that if the farmers write the clause into the insurance contract, the expected cost is k, whereas if the transfer is implemented by the government ex post, the expected cost would be pk, where p is the probability of the low-probability event: pk could be substantially smaller than k.[25]

A possible objection to the relevance of the example is that ex post transfers could be much more expensive than a mere clause in an insurance contract. The objection is well taken. Let the cost of ex post intervention be denoted by K and let us assume that K is significantly larger than k. First, the comparison of expected values is now between k and pK.

24. Under asymmetric information, this situation gives rise to the classical moral hazard problem discussed in the insurance literature (see Kreps, 1990).

25. I conduct the discussion in terms of expected values, although a rigorous approach would be based on utility functions. However, the substantive implications in the text carry over to the more general case of risk aversion.

Thus, if p is small enough, ex post intervention could still dominate the writing of an ex ante clause. Furthermore, in reality there are many low-probability events. Let the cost of each clause be the same and equal to k, and let N be the number of mutually exclusive low-probability events. If written as ex ante clauses, the social cost is Nk, whereas if the government makes the optimal ex post transfer, the cost is still pK, which reinforces the case for ex post intervention.[26]

I now return to the central thread of the discussion. Several recent crises could be claimed to be low-probability events, at least from the perspective of 1994. I would even be prepared to argue that the spread of the Russian 1998 crisis across emerging market economies was also a low-probability event from the standpoint of July 1998.[27] The attack on the Twin Towers and the resulting increase in aversion to air travel is undoubtedly another low-probability event.[28] Writing contracts contingent on these events would hardly be justified ex ante. The events, however, are quite clear, as are their consequences. This establishes a basis for the kinds of post-crisis intervention outlined in the previous section.

An open economy presents new and challenging issues. The two farmers in the story are now residents of different countries. Thus ex post transfers cannot be implemented by a single authority. Transfers become an international issue involving (at least) two sovereign nations. To complicate matters even further, authorities in country A, say, are elected by the residents of that country. Policymakers in the country that got lucky may be highly reluctant ex post to carry out the corresponding international transfers.

Thus far, the discussion has not touched on the debt issue. Consider the point-input-point-output Ricardian case in which labor is employed one period in advance, and the labor cost is financed by loans. It may be individually optimal in some cases not to make loan repayment contingent

26. The cost of writing clauses encompassing low-probability events need not be proportional to N. In the example of the farmers, one clause could specify the transfers in terms of output corresponding to each low-probability event, which could arguably be less costly than writing separate clauses.

27. See Guillermo Calvo, "Understanding the Russian Virus, with Special Reference to Latin America," (www.bsos.umd.edu/econ/ciecalvo.htm [October 1998]) and "Contagion in Emerging Market: When Wall Street Is the Carrier," (www.bsos.umd.edu/econ/ciecalvo.htm [February 1999]).

28. For example, tourist cancellations in Jamaica right after the attack exceeded 80 percent!

on certain low-probability events, even though both parties would benefit from writing a contingency clause to that effect if transaction costs were nil. Under certain circumstances, ex post government intervention can also generate ex ante Pareto improvement. Such intervention, for example, could take the form of debt forgiveness in catastrophic low-probability events. These transfers, as noted above, could be difficult to implement when international loans are involved. Negotiations are time-consuming. In the meantime, output losses occur as a result of bankruptcy procedures—a situation that is particularly damaging if key sectors like banking or airlines are involved, since their failure would be detrimental to many other sectors of the economy. There are thus circumstances in which it would be socially beneficial for the government to socialize private debts by, for instance, extending low-interest loans to the affected sectors, while financing the operation through new public debt obligations.[29] This policy implies a transfer from the domestic economy as a whole to the damaged sector, which is, in principle, inferior to a transfer from the creditor to the damaged sector. But the policy may be justified if externalities are large enough. Debt socialization may also help to implement Pareto-improving international transfers, because governments have direct access to international financial institutions and are in a better position than the private sector to obtain bilateral official aid or credit.

Delayed Reform

Transfers associated with low-probability events are common in a large country like the United States, where catastrophic shocks occur every year. Floods, hurricanes, and tornadoes are recurring events that trigger immediate federal transfers, and the government takes on the role of transferrer of last resort. To be able to perform this task effectively, the government should be capable of generating the necessary resources through higher taxes, donors' contributions, or lower expenditure on other items. In this context, I define delayed reform as a situation in which the government is unable or unwilling to articulate clear-cut policies to fund its transfer activities. Consequently, when faced with a low-probability event that

29. Diaz-Alejandro (1985) discusses socialization of private debts in Chile during the 1982–83 crisis.

calls for a transferrer of last resort, people are uncertain as to how the transfer operations will be funded or whether they will be funded at all.[30] Here I take delayed reform as an assumption and do not address the underlying political economy considerations.[31]

A typical case is a country that suffers a large low-probability deterioration of its terms of trade (for example, Nicaragua after the recent collapse of coffee prices caused by Vietnam's large crops). As a result, the equilibrium price of nontradables relative to tradables falls (that is, the equilibrium real exchange rate depreciates), and if interest rates are not indexed to nontradables prices, then massive bankruptcies are likely to follow (especially if the country has recently experienced a large capital inflow episode)—unless the government comes to the rescue as a transferrer of last resort.[32] The immediate fiscal effect of the terms-of-trade deterioration is lower fiscal revenue. Moreover, if the country is highly specialized, there will be few healthy sectors from which to collect rescue funds. This situation will likely drive the government to issue new debt without making it explicit how repayment will be engineered. Since default would be a real possibility, investors will charge a hefty country risk premium.

Who will eventually foot the bill? Precisely because that question remains unanswered, everyone will run for cover the moment they realize that a low-probability event of major dimensions has taken place. Investors postpone decisions as they wait for the dust to settle, which further reduces growth rates and weakens the fiscal stance. The deleterious impact of delayed reform thus becomes stronger by the day once the economy is hit by a large low-probability event that calls for government inter-

30. I do not imply that delayed reform afflicts only emerging market economies. As pointed out to me by Allan Meltzer, recent U.S. economic history exhibits clear episodes reflecting that characteristic. Delayed reform may be devastating, however, if the body politic is hit by sufficiently large undiversifiable shocks, as the previous discussion suggests may have been the case in the recent emerging market crises.

31. For further discussion on the political economy of delayed reform, see, for example, Sturzenegger and Tommasi (1998, part 1).

32. Irving Fisher (1933) identifies bankruptcies following a sharp change in relative prices as a key factor in explaining the depth of the Great Deflation. He focuses on the case in which loans specify a fixed nominal interest rate, and the nominal price level suffers a sharp unexpected drop. However, this kind of financial shock would hold whenever a debtor is faced with a sharp, unexpected deterioration of a product price, on which the loan's interest rate is not being indexed. I pick up this topic in connection with the dollarization debate in Calvo (2001).

vention. The private sector is seriously tarnished, too. Fiscal uncertainty increases the uncertainty of the net (after tax) return on private sector projects. Moreover, running for cover in an open economy implies, among other things, capital flight and a run on the domestic banking system, which creates the need for even bigger government transfers. What will governments do under such circumstances? The likely approach is Plan B, as Krugman recently called it in connection with the crisis in Malaysia: namely, controls on capital outflows.[33] Plan B is typically carried out through foreign currency controls. Floating exchange rates are no solution under these circumstances because what is involved is a debt problem, and emerging market debt is typically either of very short maturity or indexed to a foreign currency.[34]

The successful IMF program in connection with the tequila crisis proves that rapid action on the part of multilaterals can be highly effective. True, Mexico's economy suffered a contraction in output exceeding 6 percent in 1995, but recovery was fast, strong, and lasting.[35] The medicine? A U.S.$50 billion package that helped to refinance short-term debts at below-market rates.[36] From this perspective, there is nothing wrong with large bailout packages in the context of low-probability events.[37] If the packages are clearly predicated on the existence of verifiable low-probability events, then they will trigger no moral hazard problems.

What is the role of tight fiscal policy during crises? As argued above, low-probability accidents that unduly increase the burden of external debt should trigger fiscal laxity. The problem under delayed reform is that fiscal laxity increases fiscal uncertainty, with nefarious consequences. Tighter fiscal policy is not likely to solve the problem either, however, unless it helps to reverse the initial negative shock. This is not likely to happen if the event is a trade account shock, such as a deterioration of the

33. *Fortune,* "Saving Asia: It's Time to Get Radical," 9 August 1998.

34. See Hausmann, Stein, and Panizza (2001).

35. Part of that fast recovery could be due to the North American Free Trade Agreement (NAFTA).

36. The package was never fully used, and it was wholly repaid before schedule. Moreover, the United States, a key donor, made a substantial profit from its U.S.$25 billion loan—no doubt benefiting many U.S. "carpenters and plumbers."

37. Was the tequila crisis a low-probability event? Evidence is strongly in favor. Mexico was the poster child of multilateral institutions in 1994, and the risk premium on Mexico's debt was very low just weeks before the crisis. Moreover, although some analysts warned about current account sustainability problems well before the crisis, few, if any, imagined that it would spread so wildly across emerging market economies.

terms of trade. Fiscal tightening could help if the low-probability event involves a credibility shock provoked by, for instance, a crisis in another emerging market, even though the economies are not linked by fundamental factors (such as trade and financial flows). In that context, tighter fiscal discipline could send a strong signal that the country in question is different, which could serve to keep interest rates from skyrocketing. In practice, it is very hard to know what is the appropriate action. Large G-7 support for countries suffering from delayed reform may therefore be crucial. Under that umbrella, the IMF doctor can operate with confidence, knowing that a large supply of blood and oxygen is available for offsetting policy errors (some of them his own, no doubt) without killing the patient.[38]

Governments suffering from delayed reform could themselves take measures that help to prevent low-probability events, in particular events involving other sovereign countries. One strategy is to ensure that debt service obligations are not bunched. This helps to eliminate self-fulfilling expectations equilibria of the type discussed by Calvo and by Cole and Kehoe.[39] Another approach is to impose controls on capital inflows, especially during capital inflow episodes. This policy, which has been implemented in Chile and Colombia, for example, can help prevent maturity bunching by lengthening debt maturity.[40]

Exchange Rate Policy: Delayed Reform in a Global Environment

The financial globalization episode that started in 1989 may be coming to an end, and the end may be unpleasant as the stock of emerging market fixed income assets held in advanced countries' portfolios starts to unravel. This is far from inevitable, however. International cooperation may get a strong boost from the new security concerns, and the emerging market economies may again become an attractive destination for FDI and other types of capital flows. What have emerging market economies learned

38. An important caveat: systemic external aid could contribute to the persistence of the delayed reform syndrome. Assessing this possibility, however, requires models that flesh out the political economy of delayed reform (see Sturzenegger and Tommasi, 1998).

39. Calvo (1998b); Cole and Kehoe (1996). The Greenspan-Guidotti proposal runs along these lines (see Guidotti, 2000).

40. See Calvo and Reinhart (2000).

about macroeconomic policy that will help them cope with a future wave of capital inflows and prevent, or at least ameliorate, future crises? I started to discuss this issue at the end of the previous section. I now focus on the exchange rate.

As one examines the monumental problems that arise in connection with deep financial crisis, the exchange rate looks like a minor distraction. And it actually is, during a crisis. The exchange rate could play a key destabilizing role, however, under the delayed reform syndrome. Changes in the exchange rate have a direct effect on relative prices. This can, for example, be due to signaling considerations, coupled with wage and price stickiness. Governments are constantly under suspicion of creating new sources of fiscal uncertainty. A devaluation could be read as a signal that the government is relying more heavily on the inflation tax, fueling devaluation and inflation expectations. Expected higher future devaluation could have an impact on today's relative prices, possibly causing financial difficulties (more on this below).[41] If large swings in the exchange rate are common, then individuals will incorporate them in their contracts, and the associated transfers might be handled by the market. However, complete markets could be suboptimal when the government's credibility is at stake.[42] The simple intuition is that credibility problems involve intertemporal distortions, which are magnified by market completeness. On the other hand, if large exchange rate fluctuations are not common and become low-probability events, then they would prompt government intervention and—under the delayed reform assumption—cause fiscal uncertainty. This is just one of several reasons why emerging market economies show a marked preference for stable exchange rates, or fear of floating.[43]

Recently, some emerging market economies appear to have relaxed their foreign currency anchor by instead adopting an inflation targeting regime. It is still too soon to know whether the new anchor will prove effective. Brazil, a recent convert, already seems to be reeling back to the old dollar anchor. In any case, a strict inflation targeting regime is not

41. See Calvo (1983).

42. Calvo (2000b).

43. Liability dollarization is another possible cause. The fear of floating literature is in its infancy, but early efforts in this area of research include Hausmann, Stein, and Panizza (2001); Calvo and Reinhart (2000, 2002); Lahiri and Végh (2001); Caballero and Krishnamurthy (2001a).

that different from exchange rate targeting. The two regimes would be identical if the exchange rate was the only item in the basket on which the inflation index is based. Moreover, both regimes are orthogonal to pure floating, in which the monetary authority sets the money supply and there is no feedback from the exchange rate to the money supply.

It is, therefore, quite misleading to say that the post-tequila world bifurcates into pure floating and pure fixed foreign exchange regimes. While Hong Kong pursues a currency board regime pegged to the U.S. dollar and Bulgaria to the Euro, I could not point to any emerging market economy that has adopted pure floating. In practice, the choice is not fixed versus floating, but rather which basket to use in targeting one's currency.

Highly dollarized economies like Argentina and Uruguay peg to the U.S. dollar.[44] Bolivia and Peru, which are also highly dollarized, have mostly followed a system that would be difficult to differentiate from pegging.[45] On the other hand, inflation targeting was first adopted in Latin America by Chile, followed by Brazil and Colombia; dollarization is not an issue in these economies. Exchange rate pegging thus appears to be the favorite of dollarized economies. Chile features a highly indexed economy: all financial transactions are expressed in UFs (Unidades de Fomento), which is a price index involving tradable and nontradable goods. Inflation targeting appears to complement the type of indexation prevailing in the Chilean financial system. More generally, the optimal basket might be linked to the type of indexation prevailing in the corresponding financial system.

The theory of the optimal exchange rate system ranks systems according to a loss function, which in many papers is given by output variance.[46] According to this welfare criterion, fixed exchange rates come out ahead when money supply and money demand shocks are dominant, while float-

44. A country is highly dollarized if it shows a high incidence of foreign-exchange-denominated deposits and bank loans. As argued by Hausmann, Stein, and Panizza (2001), most emerging market economies exhibit dollarized external debt.

45. See Calvo and Reinhart (2002) and Morón, Goñi, and Ormeño (1999). Peru let its currency devalue quite sharply starting in the second half of 1998. At the same time, however, the share of nonperforming loans doubled, a phenomenon that appears to have made policymakers more cautious about using this instrument. One leading conjecture is that borrowers take dollar-denominated loans to finance projects in the nontradables sector. A large devaluation could thus contribute to the spread of bankruptcy in that sector.

46. For recent discussions focusing on emerging market economies, see Calvo (2001) and Hausmann, Stein, and Panizza (2001).

ing exchange rates are preferable when the dominant shocks are real, that is, originating in output demand and supply considerations. Standard theory ignores balance sheet shocks, like those discussed earlier. If those shocks are taken into account in an economy with a highly dollarized financial system, for example, the case for fixed rates becomes stronger. On the other hand, if dollarization is not an issue and, say, the financial system is indexed à la Chile, then balance sheets are much more insulated from fluctuations in the nominal exchange rate. To the extent that not all prices and wages are fully indexed, abrupt changes in the inflation rate would cause balance-sheet trouble in the excluded sectors, and inflation targeting becomes an attractive system.

Balance-sheet shocks are important under delayed reform because they trigger uncertainty-generating government intervention. As noted, a highly dollarized financial system increases the appeal of fixed exchange rates. But dollarization is not the only relevant consideration. For example, all countries are linked to the rest of the world through trade. Abrupt changes in the exchange rate may bring about other, more subtle balance-sheet problems stemming from the impact that fluctuations in the nominal exchange rate have on earnings. This is most apparent for firms that produce nontradables by means of imported raw materials. If the associated fluctuations in the real exchange rate have some degree of persistence, shocks to the nominal exchange rate will also have balance-sheet effects. Moreover, as noted above, credibility problems could also provoke changes in the real exchange rate, which could be quite sharp under flexible exchange rates.[47] Consequently, balance-sheet considerations may strongly bias governments subject to delayed reform toward fixed exchange rates.

General Policy Considerations

Previous sections demonstrated the limited scope of policy in economies that are afflicted by delayed reform, as well as the desirability of lowering the number and potential intensity of balance-sheet shocks. This is especially pertinent given the present lack of systemic instruments for

47. Recall the literature on exchange rate overshooting, including Dornbusch (1976) and Calvo and Rodriguez (1977).

dealing with global crises. Emerging market economies are visited by highly disruptive phenomena like sudden stops, which can wreak havoc on an otherwise well-run economy.

A safe strategy seems to be the adoption of policies that help offset the effects of delayed reform, such as trade agreements with large developed economies, which then have an incentive to assist the emerging market country in developing advanced institutions. Another example is full dollarization.[48] If the crisis has already hit, however, debt restructuring may be necessary. This represents a serious complication for governments subject to delayed reform. Exclusively relying on domestic solutions is likely to be costly, leading to situations in which social objectives are held back, while husky lobbyists take control. Multilateral institutions could play a useful role by helping to de-politicize the decisionmaking process. No new institutions are necessary for that purpose, but more funding and innovative financial products (such as guarantees) may be appropriate. One can only hope that prejudice and sheer intellectual inertia will not undermine the creativity necessary for dealing with these important issues.

A final note. Empirical knowledge in macroeconomics derives mostly from the experience of developed economies. However, the little that is known about emerging market economies suggests that they are financially more fragile and more vulnerable than their developed counterparts. Their relatively short track record, small size, and political instability seem to militate against the existence of institutions and informational bases comparable to those found in developed economies. Policies that work for developed economies may not transport well into emerging market territory. This is an important insight. Unfortunately, the scant available empirical work leaves the field open to wildly different interpretations that appear equally valid on the surface. This could provoke the policymakers' paralysis I warned about above. There is thus an urgent need for serious, convincing empirical work in this field.

48. See Calvo (2001) for further discussion.

References

Caballero, Ricardo J., and Arvind Krishnamurthy. 2001a. "A Vertical Analysis of Crises and Central Bank Interventions." Massachusetts Institute of Technology.

———. 2001b. "International and Domestic Collateral Constraints in a Model of Emerging Market Crisis." *Journal of Monetary Economics* (48)3: 513–48.

Calvo, Guillermo A. 1983. "Temporary Stabilization: Predetermined Exchange Rates." *Journal of Political Economy* 94 (December): 1319–29.

———. 1998a. "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stops." *Journal of Applied Economics* (CEMA) 1(1): 35–54.

———. 1998b. "Varieties of Capital-Market Crises." In *The Debt Burden and Its Consequences for Monetary Policy*, edited by Guillermo Calvo and Mervyn King, 181–202. Macmillan.

———. 2000a. "Balance-of-Payments Crises in Emerging Markets: Large Capital Inflows and Sovereign Governments." In *Currency Crises*, edited by Paul R. Krugman, 71–104. University of Chicago Press for National Bureau of Economic Research.

———. 2000b. "Betting against the State: Socially Costly Financial Engineering." *Journal of International Economics* 51 (June): 5–20.

———. 2001. "Capital Markets and the Exchange Rate, with Special Reference to the Dollarization Debate in Latin America." *Journal of Money, Credit and Banking* 33 (May, part 2): 312–34.

Calvo, Guillermo A., Leonardo Leiderman, and Carmen M. Reinhart. 1993. "Capital Inflows and Real Exchange Appreciation in Latin America: The Role of External Factors." *IMF Staff Papers* 40(1): 108–51.

Calvo, Guillermo A., and Enrique G. Mendoza. 2000a. "Capital Market Crises and Economic Collapse in Emerging Markets: An Informational-Frictions Approach." *American Economic Review* (May, *Papers and Proceedings, 1999*): 59–64.

———. 2000b. "Rational Contagion and the Globalization of Securities Markets." *Journal of International Economics* 51(1): 79–113.

Calvo, Guillermo A., and Carmen M. Reinhart. 2000. "When Capital Flows Come to a Sudden Stop: Consequences and Policy." In *Reforming the International Monetary and Financial System*, edited by Peter B. Kenen and Alexander K. Swoboda. Washington: International Monetary Fund.

———. 2001. "Fixing for Your Life." In *Brookings Trade Forum*, edited by Susan M. Collins and Dani Rodrik, 1–58. Brookings.

———. 2002. "Fear of Floating." *Quarterly Journal of Economics* 117(2): 379–408.

Calvo, Guillermo A., and Carlos A. Rodriguez. 1977. "A Model of Exchange Rate Determination under Currency Substitution and Rational Expectations." *Journal of Political Economy* 85 (April): 617–25.

Céspedes, Luis F., Roberto Chang, and Andrés Velasco. 2001. "Dollarization of Liabilities, Net Worth Effect, and Optimal Monetary Policy." Paper prepared for the Sixth Annual Meeting of the Latin American and Caribbean Economic Association (LACEA). Montevideo, Uruguay, 18–20 October.

Cole, Harold L., and Timothy J. Kehoe. 1996. "A Self-Fulfilling Model of Mexico's 1994–1995 Debt Crisis." *Journal of International Economics* 41(3-4): 309–30.

Diaz-Alejandro, Carlos F. 1985. "Good-bye Financial Repression, Hello Financial Crash." *Journal of Development Economics* 19(1). Reprinted in *Trade, Development and the World Economy*, edited by Andrés Velasco, chap. 17. Basil Blackwell.

Dornbusch, Rudiger. 1976. "Expectations and the Exchange Rate Dynamics." *Journal of Political Economy* 84 (December): 1161–76.

Fisher, Irving. 1933. "The Debt-Deflation Theory of Great Depressions." *Econometrica* 1(4): 337–57.

Guidotti, Pablo E. 2000. "Toward a Liquidity Risk Management Strategy for Emerging Market Economies." Universidad Torcuato Di Tella.

Hausmann, Ricardo, Ernesto Stein, and Ugo Panizza. 2001. "Why Do Countries Float the Way They Float?" *Journal of Economic Development* 66(2): 387–414.

IMF (International Monetary Fund). 2001. *The World Economic Outlook (WEO) Database, December 2001.* Washington.

Izquierdo, Alejandro. 2000. "Credit Constraints and the Asymmetric Behavior of Asset Prices and Output under External Shocks." Washington: Inter-American Development Bank.

Jeanne, Olivier. 2001. "Why Do Emerging Economies Borrow in Foreign Currency?" Paper prepared for the Sixth Annual Meeting of the Latin American and Caribbean Economic Association (LACEA). Montevideo, Uruguay, 18–20 October.

Keynes, John Maynard. [1931] 1963. "The Consequences to the Banks of the Collapse of Money Values." Reprinted in *Essays in Persuasion*. W. W. Norton & Company.

Kiyotaki, Nobuhiro, and John Moore. 1997. "Credit Cycles." *Journal of Political Economy* 105(2): 211–48.

Kreps, David. 1990. *A Course in Microeconomic Theory*. Princeton University Press.

Krugman, Paul R. 1992. *Currencies and Crises*. MIT Press.

Lahiri, Amartya, and Carlos A. Végh. 2001. "Living with the Fear of Floating." Paper prepared for the Sixth Annual Meeting of the Latin American and Caribbean Economic Association (LACEA). Montevideo, Uruguay, 18–20 October.

Lerrick, Adam, and Allan H. Meltzer. 2001. "Blueprint for an International Lender of Last Resort." Carnegie Mellon University.

Meltzer, Allan H. 2000. "Report of the International Financial Institution Advisory Commission." U.S. Senate Committee on Banking, Housing, and Urban Affairs.

Mendoza, Enrique, and Katherine Smith. 2001. "Margin Calls, Trading Costs, and Asset Prices in Emerging Markets: The Financial Mechanics of the 'Sudden Stops.'" Duke University.

Morón, Eduardo, Edwin Goñi, and Arturo Ormeño. 1999. "Central Bankers' Fear of Floating: The Peruvian Evidence." Lima: Universidad del Pacífico.

Sturzenegger, Federico, and Mariano Tommasi. 1998. *The Political Economy of Reform*. MIT Press.