

Bank Insolvency: Bad Luck, Bad Policy, or Bad Banking?

Gerard Caprio Jr. and Daniela Klingebiel

Since the late 1970s bank insolvencies have become increasingly common. Where these failures are systemic, they can drain a country's financial, institutional, and policy resources—resulting in large losses, misallocated resources, and slower growth. Using a new database covering some eighty-six episodes of insolvency, this article examines the causes and effects of these crises and how governments have responded. It finds that both macroeconomic and microeconomic factors have figured in bank crises and that, based on the criteria developed here, few governments have responded well to these episodes. To better manage insolvencies, policymakers must develop a regulatory framework that allows banks to respond more robustly to shocks and ensures proper management and oversight. That bankers have not regularly planned for shocks suggests that they have not had the incentive to do so.

No degree of regulatory wisdom could or should have made the 1920s a profitable time for banks in [U.S.] agricultural regions affected by drastic declines in prices and land values. In the face of these shocks, some failures were inevitable. What regulation could have done, but did not do, was make the system as a whole less susceptible to shocks and more resilient in its response to failures.

—Charles Calomiris (1992, p. 312)

The past ten to fifteen years have been to economists interested in banking and incentive issues what the 1840s and 1850s were to gold prospectors in California. After several decades—most of the post-World War II era—of relatively calm financial markets, in recent years there has been a profusion of banking crises in a variety of industrial and developing countries, in many cases widespread enough to qualify as systemic. In absolute terms Japan will likely suffer the largest losses, with official estimates putting nonperforming loans in 1995 at about \$400 billion (unofficial estimates reach \$ 1 trillion, or about 25 percent of GDP). Argentina in the early 1980s likely saw the largest relative loss (estimated variously at 20-55 percent of GDP), with Chile not far behind (1302 percent of GDP). In both cases losses

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appear to have been closer to the upper end of these ranges.¹ The lower end, typical of losses in many developing countries, does not capture the slowdown in economic growth when resources are driven out of the formal financial sector (and into less efficient uses) and stabilization programs are derailed.

Based on a first-ever compilation of data on insolvencies around the world since the late 1970s, we analyze the factors that have caused these crises, and how governments have responded.² Extending the line of research started by Sundararajan and Balino (1992), Brock (1992), and Sheng (1996), we examine a wider variety of cases and link macroeconomic and microeconomic factors in the debate about how bank insolvency arises and spreads. Most episodes of insolvency are caused by a mixture of bad luck, bad policies—both microeconomic (regulatory) and macroeconomic—and bad banking. But these factors are neither independent nor immutable. Although establishing an absolutely fail-safe banking system should not be the goal of reform—even if it were possible, it likely would be too expensive—banking systems can, as Calomiris (1992) suggests, be made more robust in their responses to bad luck and bad policies through a regulatory framework that rewards prudent and diversified risk taking by bankers.

Bank Solvency: Does It Matter?

Although many financial historians mark the rise of financial houses in thirteenth-century Italy as the origin of modern banking, one of the earliest crises on record goes back to 33 A.D., when a confluence of factors—the sinking of some ships loaded with uninsured commodities, a slave revolt, fraud, defaults on foreign debt, liquidity-draining government policies, and a bout of domestic and international contagion—shut down several banking houses in Rome (Calomiris 1989). Tiberius Caesar resolved the crisis by providing government funds to *reliable* bankers and certain debtors, forgiving some interest, and suspending government policies that had temporarily drained liquidity. Most of the institutions recovered.

This case notwithstanding, government safety nets were uncommon before the nineteenth century. Indeed, in many countries central banks were formally instituted only in the twentieth century. Until then market forces of one form or another were relied on to deal with bank insolvency, and depositors generally had no government safety net protecting their funds. Widespread bank failures were fairly common in the United States, in large part because many states had unit banks (banks with only one office). Their lack of diversification made these banks especially susceptible to failure, and indeed it was in states where such banks were common that deposit insurance schemes first became popular—and routinely failed. At the end of the twentieth century government intervention (before and especially after episodes of bank insolvency) has become commonplace, suggesting a belief that bank solvency is important. Why is this the case, and how does bank failure differ from the failure of a nonfinancial firm?

Differences between Bank and Nonbank Firms

Insolvent firms in market economies generally find it difficult or impossible to raise new funds. This lack of capital precludes their acting on profitable investment opportunities and may force them to sell important assets. Insolvency also may distort the incentives of managers, making them more susceptible to fraud and moral hazard. At the very least insolvency reduces the incentives for owners or managers to exert effort consistent with the long-run health of the firm. Although small firms have a high failure rate in market economies, major nonfinancial firms seldom cease operations when they become insolvent because they usually have both a core group of activities that remains profitable and new investment opportunities. In addition, most large firms have sizable investments in fixed capital goods that often are difficult to resell. As long as the net present value of the firm's operating profits and tax loss carryforwards exceeds its liquidation value, it makes sense to continue operations—albeit with minimal new investment, divestiture of noncore activities, and installation of new management. Insolvent firms deal with the imbalance between assets and liabilities by marking down liabilities and equity to the new, lower value of the assets and the future cash flow. Equity holders usually see most of their claims wiped out, while debt holders have a portion of their claims converted into equity. Individual funding is provided only after assets have been marked down.

The imposition of losses on creditors plays an important role in this process. Creditors do not necessarily have the best information about the troubled firm. Nevertheless, they have a strong incentive to respond to a serious deterioration in the firm's performance by seeking its restructuring or liquidation. If creditors bore none of the losses, they would have little incentive to allocate credit to its best use or to monitor the performance of borrowers. Unprofitable firms would be able to continue operating undisturbed.

When banks become insolvent, many of these adverse consequences can be deferred. The most important factor accounting for this difference is that the output and production processes of nonfinancial firms often are more transparent than those of banks, reflecting both the information-intensive nature of banking and its intertemporal quality—most bank products or services include a promise to pay in the future, meaning that it can take time for a bank's inability to fulfill its contracts to become evident. Banks can conceal problems by rolling over bad loans or by raising more deposits and increasing the size of their balance sheets. Especially when depositors enjoy explicit or implicit protection, banks often can attract new depositors with the promise of high interest rates so as to increase their bets with current clients; look for new, high-risk, high-return areas; or work a Ponzi scheme.

The opacity of bank loans also means that they are harder to sell than the typical inventories of nonfinancial firms, so it is commensurately more difficult for banks to raise liquidity to restructure when a negative shock hits. Moreover, in selling off its (hard to market) assets the bank might be forced to accept "fire sale" offers—sales of assets at a lower price than they could command given a normal search time for the highest bidder or adequate time to convey sufficient information about an asset's real quality.³ Thus banks that are in trouble have the incentive and the ability to delay loss recognition. When banks with a low or negative net worth remain open, bank owners or senior managers are less motivated to monitor them, so bank staff and officers have an ideal opportunity to engage in a variety of defalcations. The resulting tendency for insolvent

banks to increase their losses has been widely noted and suggests the need for prompt, corrective action.

Thus banks differ from nonfinancial firms because of a combination of information imperfections and intertemporal contracting. Not only can banks have trouble evaluating borrowers, but the health of a bank (or a banking system) is difficult to discern because depositors, supervisors, and other outsiders are unable to see through the veil surrounding banks' balance sheets until it is too late (Simons and Cross 1991). This information problem, coupled with banks' demandable debt and sequential servicing features, makes banking inherently fragile and susceptible to runs: depositors' first indication of trouble can be a line of other depositors waiting to collect their funds. Since banks are part of the payments system, contagion could lead to a halting of payments and a return to barter, to the detriment of overall economic activity. The simultaneous selling of assets by many banks, prompted by common shocks or even rumors, can lead to large declines in quite visible asset prices (such as that of land) and thereby increase political pressure for the government to act. Money market mutual funds, which offer a par guarantee but hold only highly liquid and riskless (or low-risk) short-term assets, do not suffer from panics or runs, except possibly in the case of fraud. Mutual funds, which do not offer a par guarantee but rather are equity-like instruments, also are less prone to runs.

The possibility of contagion means that a single bank failure has not only a direct negative effect on GDP associated with the loss of the bank's profits and wages (as with any bankruptcy) but also an indirect and potentially larger effect to the extent that the bank failure leads to or is associated with other bank failures and the shutdown of the payments system. Widespread bank failure also can indirectly affect economic activity to the extent that bank closures lead to the drying up of information, as Bernanke (1983) argues was the case during the U.S. Depression. Benston and others (1986) contend that bank failures and limited (nonsystemic) bank runs have for the most part had no greater effect on the U.S. economy than have the failures of nonfinancial firms of comparable size, and that the losses generally were low in the pre-deposit insurance era.⁴ Since the advent of a federal safety net, however, matters appear to have changed: fewer banks failed in the 1980s than during the Depression, but depositor losses per dollar of deposits were higher (White forthcoming). Even in the United States, however, and even before 1914 (when the Federal Reserve System was created), the instability of individual banks has at times developed into concerns about the banking system as a whole.

Thus the importance of bank insolvency relative to that of nonbanks can be distinguished by the possibility of a systemic crisis. The real cost to the economy of bad loans, whether as part of a generalized crisis or as isolated problems, is the misallocation of resources. Although much of the lending supported by insolvent banks is thought to be underwriting productive investments, these banks' losses are evidence that this is not always the case. But since estimates of the real return on projects—both those undertaken and those crowded out by bad loans—are often lacking, observers rely on information about nonperforming loans, loan losses, or the cost of restoring insolvent institutions to solvency as a proxy for the cost of resource misallocation.⁵

Systemic bank insolvency also drives resources out of the formal financial sector and into less productive uses. In addition to a direct budgetary impact, widespread bank insolvencies can have the added cost of changing government policy in a negative direction, such as by derailing stabilization programs or by retarding or reversing

financial and nonfinancial sector reforms. Developing and transition economies in particular are hard pressed to deal with bank insolvencies because they lack deep capital markets, which can spread the costs of insolvency over a number of years. Without this buffer, and with a more limited tax base, developing countries are more likely to resort to an inflation tax to finance banks' losses.

There is no objective, generally accepted definition of when a problem in the banking sector becomes systemic. Central bank governors tend to behave as though "they know-a systemic problem when they see one" or as though a problem becomes systemic when those at the central bank think that an event could develop into a systemwide problem. This view is not as arbitrary as it first appears: contagion can occur when creditors believe that there is a problem, and central bankers may be in the best position to discern if a crisis is likely to become systemic, since they should have good information (through their links with commercial banks) on the likelihood of a run by the liability holders of the banking system. Moreover, the presence or absence of central bank support can determine the likelihood that a crisis will occur, though support that is too readily or too cheaply available may encourage excessive risk taking and larger losses. This uncertainty and the possibility of contagion suggest that a problem can have systemic implications even if only a small portion of banking system assets is impaired.

Types of Insolvency

There are three general types of bank insolvency: those limited to a single bank or a small number of banks, which clearly are not systemic; overt banking system runs; and a more silent form of financial distress. Overt runs are easy to recognize: a banking panic (that is, a systemic run) occurs when "bank debt holders at all, or many, banks in the banking system suddenly demand that banks convert their debt claims into cash (at par) to such an extent that the banks suspend convertibility of their debt into cash" (Calomiris and Gorton 1991, p.5) or take other actions to deal with the crisis, such as securing support from a lender of last resort. Overt runs happen suddenly and end quickly. Financial distress of the banking system, when a significant portion of the system is insolvent but remains open, is perhaps the most pernicious type of insolvency. This problem is relatively common in developing and transition economies, where bank runs are averted by explicit or implicit (for example, when the state owns a large segment of the banking sector) deposit insurance. Financial distress can persist for years, overlooked by weak supervisory and regulatory systems and obscured by bankers' ability to make bad loans look good by granting new loans (de Juan 1987). Distress can continue indefinitely, but it may progress into overt runs if the public begins to doubt the validity of a government guarantee or the authorities come to recognize the costs of misallocating resources and intervene to restructure or otherwise resolve distressed institutions.

Acknowledging the uncertainties in separating systemic from more limited banking problems, Bartholomew, Mote, and Whalen (1995) define systemic risk as "the *likelihood* [emphasis added] of a sudden, usually unexpected, collapse of confidence in a significant portion of the banking or financial system with potentially large real economic effects" (p. 9). This definition avoids any quantification and leaves scope for central bankers' judgment, as alluded to earlier. When is the collapse likely, or what probability level is sufficiently high? Since one important reason sudden crises occur is that banks are opaque, defining what constitutes a crisis or systemic event is inherently subjective.

For the purpose of this article the definition is narrowed further, to cases in which the net worth of the banking system has been almost or entirely eliminated. Even though systemic problems clearly can arise when a banking system has positive net worth, it should be easy to agree that if the banking system is insolvent—that it is, if loan losses are sufficient to wipe out the system's capital—then the problem is systemic. During the 1980s the capital in many developing countries' banks was less than 5 percent of assets. Under those circumstances, if nonperforming loans net of provisions were 10 percent of assets and if banks generally collected 50 percent on these loans, then losses would be sufficient to eliminate the banking system's capital. Since this collection rate and capital ratio likely are higher than the developing country average for the 1980s, and loan loss provisioning was limited, even a lower ratio of nonperforming loans could eradicate capital.⁶ Moreover, estimates of nonperforming loans usually are biased downward, suggesting that this definition of systemic crisis is quite conservative. Thus our inclusion in the systemic crisis group of countries with ratios of nonperforming loans to total loans of 5-10 percent also appears conservative. Finally, erring to include a few banking systems with a small but positive net worth is sensible because low net worth appears routinely to be translated into negative net worth, no doubt reflecting incentives to "loot" the bank (Akerlof and Romer 1994).

Under this definition bank insolvency is widespread, with as many as eighty-six episodes in sixty-nine countries (box 1). Some judgment has gone into the compilation of the list, because data on losses are not available for many countries and because official estimates often understate the size of the problem.⁷ Moreover, virtually every transition economy belongs on this list at some stage in the transition process; to limit the number of countries with missing information, however, some were excluded. Including all the transition economies—for which we hope eventually to have adequate data—would bring the number of countries covered to about ninety and the episodes to well over one-hundred.

Box 1. Major bank insolvencies**Systemic cases****(most or all bank capital exhausted)***Africa*

Benin (1988-90)
 Burkina Faso (late 1980s)
 Cameroon (1987-present)
 Central African Republic (1980s and 1994)
 Chad (1980s and 1990s)
 Congo (1 980s and 1991)
 Côte d'Ivoire (1988-91)
 Eritrea (1993)
 Ghana (1982-89)
 Guinea (1985, 1993-94)
 Kenya (1985-89, 1992, 1993-95)
 Madagascar (1988)
 Mauritania (1 983-93)
 Mozambique (1987-present)
 Nigeria (1 990s)
 Senegal (1988-91)
 South Africa (1977)
 Tanzania (1987, 1995)
 Togo (1993-present)
 Uganda (1994)
 Zaire (1991 -92)
 Zambia (1995)

Asia

Bangladesh (late 1980s-present)
 India (1994-95)
 Nepal (1988)
 Philippines (1981-87)
 Sri Lanka (1989-93)
 Thailand (1983-87)

Latin America

Argentina (1980-82, 1 989-90, 1 995)
 Bolivia (1986-87)
 Brazil (1990, 1994-95)
 Chile (1976, 1981-83)
 Colombia (1982-87)
 Costa Rica (several instances)
 Ecuador (early 1980s)
 Mexico (1981-82, perhaps through 1990-91, 1995)

Paraguay (1995)
 Uruguay (1981 -84)
 Venezuela (1980, 1994-95)

Middle East and North Africa

Egypt (early 1980s, 1990-91)
 Israel (1977-83)
 Kuwait (1980s)
 Morocco (early 1980s)

Europe and Central Asia

Turkey (1982-85)

Transition economies

Bulgaria (1990s)
 Estonia (1992-94)
 Hungary (1991-9S)
 Latvia (1995)
 Lithuania (1995-96)
 Poland (1990s)
 Romania (1990-93)
 Russia (1995)
 Slovenia (1990s)

Industrial countries

Finland (1991-93)
 Japan (1990s)
 Norway (1 987-89)
 Spain (1 977-85)
 Sweden (1991)

Borderline or smaller cases*Asia*

Hong Kong (1982-83, 1983-86)
 Indonesia (1994)
 Malaysia (1985-88)
 Singapore (1982)
 Taiwan China (1983-84, 1995)

Industrial countries

Australia (1989-90)
 France (199-95)
 Germany (late 1970s)
 New Zealand (1 987-90)
 United Kingdom (1974-76)
 United States (1984-91)

Source: Caprio and Klingebiel 1996.

Why Banking Systems Go Bust

A long and well-developed literature has been devoted to identifying a single cause of banking crises. This section reviews the debate, including some historical evidence, and sees what can be learned from our global database. The evidence both undermines single-cause theories of insolvency and finds a more important role for microeconomic factors than is commonly conceded.

Macroeconomic Explanations

Although many analysts have found microeconomic or financial causes for bank crises, a recent study of crises in Latin America emphasizes their macroeconomic roots (Gavin

and Hausmann 1996). The authors do not say that banking crises are always and everywhere a macroeconomic phenomenon, but they do use the following analogy:

Chains break at their weakest link, but that does not mean that the specific flaws in the weakest link fully explain why the chain broke; one needs also to understand what caused the tension on the chain. Indeed, strengthening weak links in the chain only works if one succeeds in identifying the weakest link before it snaps.... Tension is placed on the chain by economy-wide factors, including, in particular, macroeconomic developments. When macroeconomic forces place great strain on the banking system, the weakest banks are the ones most likely to fail, but it is the macroeconomic tension, as much as the weakness of individual banks, that causes the failures. (Gavin and Hausmann 1996, pp. 27-28)

This view echoes that of Gorton (1988), who finds that in the United States recessions cause bank panics but bank panics do not cause recessions—a conclusion that applies to overt forms of bank insolvency, is based on the pre-Federal Reserve period (when there was no federal safety net for banks), and depends on which episodes one defined as panics. By using an overt run as the defining event of a bank crisis, this approach might merely identify the denouement of a tragedy, as when a terminally ill patient checks into a hospital before dying. If instead the disease itself—unsafe and unsound banking—is defined as the crisis, then it is possible that crises begin long before a system collapses and might even cause or contribute to macroeconomic problems, as Bernanke (1983) contends was the case during the U.S. Depression. Since prolonged periods of financial distress are quite common in developing countries, this article explores the more general problem of bank insolvency in its various manifestations, with bank runs as a subset.

Whether macroeconomic pressures are uniformly the main cause of bank crises can be elucidated by considering two economies with similar macroeconomic shocks and structures but with different outcomes in the banking sector. Perhaps the best examples are Canada and the United States. Both endured the severe shocks associated with the Great Depression, yet the United States saw 15,000 banks fail during the 1920s and 1930s, and Canada saw only one bank fail (in 1923).⁸ The depression was less severe in Canada than in the United States, suggesting that bank failures make a difference (Haubrich 1990). The banking crises of 1873, 1893, and 1907 caused large losses in the United States, but no crises occurred in Canada (Bordo forthcoming). At the very least this example suggests that forces in addition to macroeconomic factors are worth analyzing in predicting, diagnosing, and assessing the costs of bank failures. Also, Benston and others (1986) note that between 1875 and 1933 the correlation between the failure rates of U.S. banks and those of businesses was a mere 0.24. They conclude that while "bank failures and the state of the national economy are intertwined . . . [they are] not very closely [intertwined] at all times" (p. 59). If macroeconomic explanations are not sufficient to explain bank crises, what other factors might lie behind bank insolvency?

Other Possibilities

A number of analysts have made theoretical attempts to uncover the main cause of banking crises. Guttentag (1994) and Bartholomew, Mote, and Whalen (1995) produced the most succinct summaries of the factors behind banking crises,

including the well-known debt-deflation school of Kindleberger (1978), Minsky (1982), and Bernanke (1983), who contend that although bank crises may not cause recessions, they certainly make them worse. Poor information markets and weak banks make this type of credit crunch more likely in developing countries, particularly after major swings in relative prices (Caprio 1992). General uncertainty, asymmetric information, and speculative bubbles led by excessive credit growth are other commonly cited factors. Increasingly, financial liberalization is mentioned as a cause of bank insolvency, likely because many recent insolvencies came on the heels of reform attempts. And in many cases a variety of regulatory and bank-specific management factors—including asset-liability mismatches, insufficient diversification, connected lending, and fraud—are cited (see below).

It is often claimed that bank insolvency in transition economies is different from that in market economies, and certainly this assertion can be justified in the transition economy banking systems that experienced massive initial losses as a result of the bad debts—most stemming from loans made to uncompetitive state-owned enterprises—inherited from pre-transition regimes. All the transition economies dealt with these early losses, however, most often by inflating them away. Succeeding rounds of insolvency have appeared in many transition economies as a result of political interference, lending to state-owned enterprises, poor management, and a variety of other factors similar to those cited worldwide.

In all economies it is entirely possible and indeed likely that there is not one but a variety of causes of bank insolvency. For example, a macroeconomic shock or heavily concentrated loan portfolio might cause one (or more) bank(s) to have low or negative net worth. Private owners then have less incentive to manage the bank well, and indeed where their liability is limited they have every incentive to gamble or loot the bank, as noted earlier. This tendency helps explain why losses in the U.S. savings and loan institutions skyrocketed from an initial \$30 billion to a final \$150 billion (Barth and Bartholomew 1992).⁹ Where the supervisory and regulatory regime is not particularly stringent or the government intervenes directly in allocating and pricing credit, as in many developing countries, initial losses might stem from politically motivated lending, connected lending, or outright fraud. Governments often fail to confront the problem early on, however, and delays routinely lead to much larger losses. The common link between different types of bank failure is that initial losses, whatever their cause, often multiply when prompt corrective action is not taken.

What the Data Say

The rest of this section examines what our data on a global set of banking crises can tell us about their origins. Because macroeconomic factors are more readily quantified, we look there first. Gavin and Hausmann (1996) argue that excessive credit growth is a primary factor behind banking crises. Although this appears to be true in Latin American crises, the link between credit growth and insolvency disappears when a broader sample is considered (figure 1).

Rapid credit growth often leads to or reflects a decline in the credit standards of individual banks. When a banking system grows rapidly, it is difficult for supervisors (or even bankers) to keep abreast of loan quality, since their information usually arrives late.

The rate at which credit growth becomes excessive and the amount of time it needs to persist before being clearly indicative of a problem are difficult to gauge. But given the tendency of financial systems to deepen gradually as countries grow, real credit growth of one to two times GDP growth might be expected in normal times. A more definitive test of the role of credit would be possible if it were easier to identify with confidence a set of countries without banking problems. Doing so is a daunting challenge, however—consider that just a few years ago many observers viewed Japan's banking system as a model for others to follow; fewer would do so today.

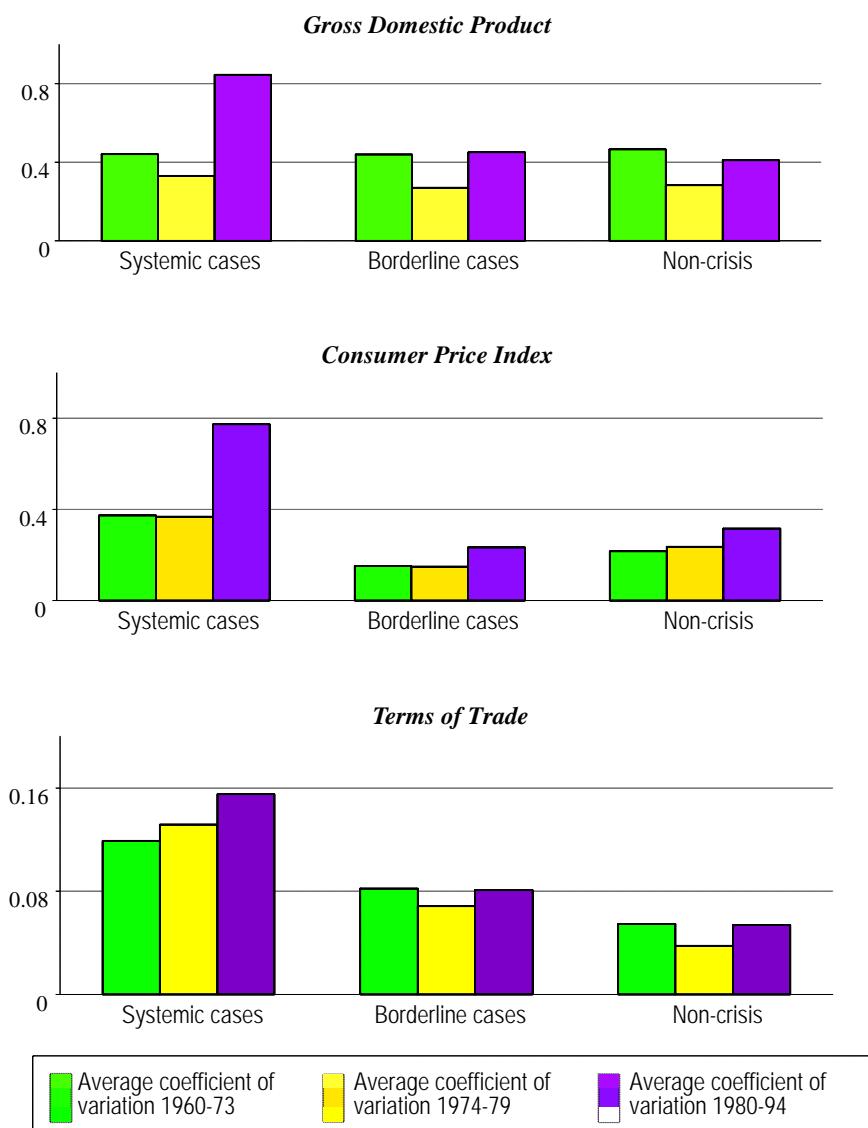
With somewhat greater certainty, given both the favorable macroeconomic climate and the higher franchise value of banking, we selected OECD countries during the 1960s as a crisis-free sample. These countries not only fall within the "safe" zone in figure 1 (real credit growth of one to two times real GDP growth), they also do so with so little variation that it is not possible to display all twenty observations. Many of the borderline or less significant episodes of bank insolvency also lie near this zone. In addition to the Latin American countries above the safe zone of credit growth, many countries, particularly African and transition economies, show signs of a credit crunch. This crunch may reflect factors such as tight monetary policy, an aversion to lending on the part of banks because of a high-risk environment, or an episode of insolvency that began before the data shown here.

From figure 1 one might conclude that officials should pay closer attention to credit growth and sound macroeconomic policy, though it is notable that what appeared to be excessive credit growth in Indonesia (and Japan) occurred at a time of single-digit inflation. It may well be that the monetary authorities should look at broader indicators of

asset prices (which have little if any weight in consumer and producer prices) as well as at credit developments. But as the figure suggests, other factors also play a role in banking problems.

Volatility is another possible cause of crisis, since large variations in output and prices make it more difficult to pick good borrowers. Since 1980 crisis countries have seen greater volatility in output, inflation, and terms of trade (figure 2). To be sure, part of the volatility in GDP and inflation was caused by the banking crises. Less feedback effect might be expected in the volatility of terms of trade since relative prices are determined mainly by international factors. Also notable is that crisis countries experienced not only significantly greater volatility in terms of trade than did the other two groups but also significant shocks in the years prior to the episode. In 75 percent of the crisis countries the terms of trade fell by more than 10 percent in the years preceding the episode, with an average fall of 17 percent. Borderline crisis countries saw a 4 percent decline, while the noncrisis countries saw a 4 percent rise.¹⁰ Many of the developing countries in our sample are highly concentrated in a few commodities (Caprio and Klingebiel 1996) and, as suggested by the earlier comparison of U.S. states with no branching restrictions with states having undiversified unit banks, banks in small economies are highly vulnerable to external shocks.

Figure 2: Bank Crises and Volatility



In sum, a combination of greater volatility and shallow financial markets is particularly harmful, since it means that the shocks are more damaging and the means for spreading their costs over time are more limited. Figure 2 also suggests that the regulatory framework (such as Bank for International Settlements guidelines) devised for noncrisis countries is likely to be inadequate for developing countries, as well as for some industrial countries that have experienced greater volatility.

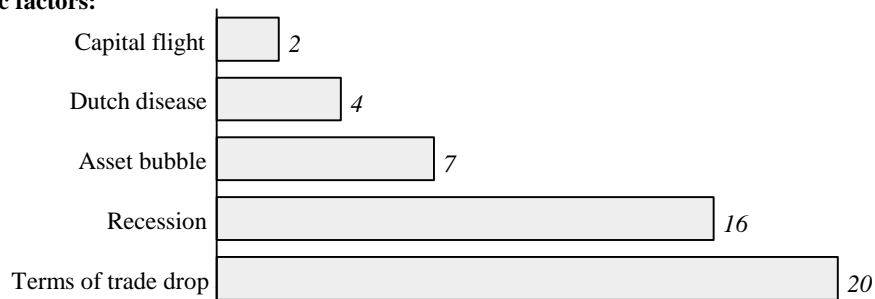
Macroeconomic disturbances of any kind can weaken the nonfinancial sector and then show up in the portfolios of banks. But a poor (or wildly expansionary) macroeconomic climate need not be fatal to banks. The regulatory framework—which, along with a variety of institutional variables, plays a crucial role in defining the incentive system in banks and the environment in which they function—

determines how resilient a banking system is in the face of shocks. Obtaining information on how incentives operate is difficult. But for the subset of twenty-nine episodes for which we could obtain better information (from published reports or interviews with experts) and which includes the most prominent and severe cases of banking sector insolvencies of the past fifteen years, the primary causes of bank insolvency are considered to be deficient management, faulty supervision and regulation, government intervention, or some degree of connected or politically motivated lending (figure 3).¹¹ Although large terms of trade declines figured in about two-thirds of the sample and recessions in about half, microeconomic factors were even more prevalent, indicating the presence of incentive distortions. Although events like capital flight or bank runs may have occurred more than twice in this subset, neither factor was thought to be important in most cases. And though many countries suffer from weak judicial systems— and improvements in this area likely would help instill better incentives—these deficiencies did not occur overnight and were rarely considered to be a main cause of insolvency.

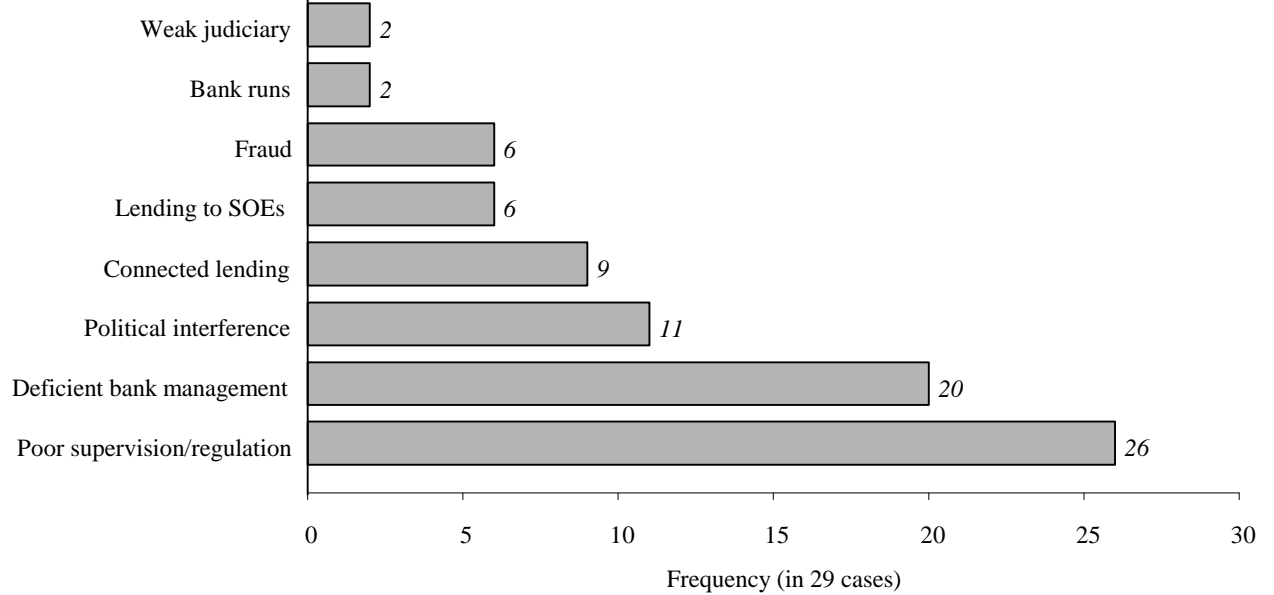
This assessment does not help settle the issue of whether macroeconomic or microeconomic causes are more important, but it does suggest that even when macroeconomic disturbances are the main factors precipitating a banking crisis, it is by no means clear that they are the most important causes. The Gavin-Hausmann "chain" analogy at the beginning of this section breaks down to the extent that the links in the chain—the banks themselves—know that pressures on the links will occur frequently and unpredictably. In such a world putting all the blame on external forces is more an excuse than a justification (Fetter 1931). Macroeconomic factors often play an important but indirect role: a strong macroeconomic climate can help erode incentives for prudent banking—why sink resources into assessment or monitoring if repayment rates are

Figure 3: Factors Behind Bank Insolvency

Macroeconomic factors:



Microeconomic factors:



high?—whereas a downturn exposes the results of poor management. And a regulatory framework designed to cope with routine shocks can prove inadequate if the shocks are sufficiently large. Thus authorities have to be continuously alert to the erosion of incentives in good times and prepared to act as a lender of last resort (only) in inordinately bad times.

A thorough analysis of why bank insolvency has increased in the past fifteen to twenty years and of why losses appear to be far larger than even during the Great Depression is beyond the scope of this article. But several factors have likely contributed. The last wave of banking problems was in the 1930s. During the thirty years following World War II systemic bank insolvency was for the most part thought to be a matter of historical interest—no doubt reflecting a good macroeconomic environment. Also, the spread of state ownership of banks allowed problems to be disguised. It is certainly plausible that greater macroeconomic volatility has contributed to the increased incidence of banking problems, particularly since the end of the pegged exchange rate system in 1973. Although figure 2 shows that crisis countries experienced less volatility in terms of trade than in inflation and output, many developing countries saw their terms of trade rise during the 1960s, whereas during the more recent period the trend was very much negative.

The increase in the number of separate banking systems during the postwar period—resulting from the end of colonization in many countries, the dissolution of several empires, and the breakup of the Soviet Union—has meant that there are more banking systems and more new banks but fewer skilled bankers or supervisors and relatively low capital levels, especially compared with the pre-Depression era— a good recipe for insolvency. Additionally, at the microeconomic level incentives for prudent risk taking in banking systems have weakened. In part this may be due to Kindleberger's (1978) warning that each generation needs its own follies—bankers who survive recessions or the bursting of speculative bubbles remember the lessons and become more conservative, but each new generation of bankers has to relearn them. Indeed, the recent wave of bank insolvencies might also be attributed to the good economic climate of the postwar period. By making it easier for borrowers to repay, this climate may have encouraged weaker credit standards and less investment in monitoring.

In addition, the lifespan of tightened credit standards can depend on the franchise value of bank licenses (Caprio 1996), which has declined in several industrial countries since the 1950s largely as a result of increased nonbank competition (Keeley 1990; Weisbrod, Lee, and Rolas-Suárez 1992); in all likelihood greater profitability would have induced more prudent conduct. Moreover, bankers' willingness to take risk must have been increased by the spread of deposit insurance schemes, both implicit and explicit (Garcia 1995); that is, by the unwillingness or inability of governments to treat banks the way they treat (or should treat) nonfinancial firms. Thus it is also plausible that in addition to increased volatility, an increase in bankers' incentives to take risk explains why banking no longer appears to be so safe.

How Countries Have Responded

In contrast to the laissez-faire practices of the nineteenth century, governments in recent years (as in the time of Tiberius Caesar) have felt compelled to step in when bank insolvencies become widespread. Not all government interventions have been successful, and there are lessons to be derived from the more successful performers relating both to how the problems arose and to how they were resolved.

Evaluating the Success of the Restructuring Exercise

Measuring success and failure in finance is difficult because no single indicator reflects how well a financial system performs its various functions. Here we use four criteria to evaluate attempts to deal with bank insolvency:

- *Financial deepening.* Financial system deepening, as signaled by a rising ratio of M2 (or a broader monetary aggregate) to GDP, indicates that the banking system has stabilized in the aftermath of the crisis. A flat or falling ratio shows that problems remain in the banking sector.
- *Development of real credit.* Moderate growth of real credit indicates that the crisis has passed. Negative real credit growth may reflect a credit crunch,¹² while exploding credit growth (well in excess of twice real GDP growth and sustained for several years) may reflect distress borrowing from those in default.
- *Real deposit interest rates.* Real deposit interest rates above 10 percent are a strong indicator that banks are bidding up rates in order to stay afloat and signal that there is financial distress in the banking system (Brock 1995).¹³ On the other hand significantly negative real rates on a sustained basis often signify a credit crunch or government intervention.
- *Recurrent problems in the banking system after restructuring.* The ratio of nonperforming loans to total loans should fall in the aftermath of a banking crisis. A flat or rising ratio (relative to the level during the crisis period) implies that banks' health did not improve on a long-term basis after restructuring. Unsustained recovery might have different causes—for example, banks did not stop lending to their borrowers in default or the government did not manage to bring fiscal, monetary, or external imbalances under control. A repeated episode of widespread insolvency is the surest sign that attempts to cure the previous episode did not succeed; isolated episodes of bank failure might indicate success.

Of the eighty-six episodes of bank insolvency listed in box 1, data on these four indicators of success are available for sixty-four. We scored a country's banking sector performance in each of these areas as a one (performance consistent with a sound financial system) or a zero (there may still be problems). A country that scores a four after restructuring is considered a clear success, at least for now; just as central bankers can never eliminate inflation but have to be ever vigilant about its revival, regulating a banking system and responding to insolvency requires constant attention. A score of two or three indicates a mixed result, which could go either way, while a zero or one means either that the response was deficient or that there

has not been sufficient time since the episode to see clearly the fruits of the policy response. This last point should be stressed: given that many countries have encountered insolvency problems during the 1990s, it may well be too early to judge success or failure. For that reason we focus below on four cases that occurred in the 1980s.

Very few of the sixty-four cases are clear successes, and among developing countries only Chile and Malaysia make this category (table 1). Twenty-eight restructuring exercises achieved mixed results, indicating that some problems persisted in the banking system. Among these cases Benin, New Zealand, the Philippines, and Thailand score a three (see Caprio and Klingebiel 1996 for detailed results). An equal number of cases have yet to be resolved or were unsuccessful. Of this group five countries—the Central African Republic, Chad, the Congo, Guinea, and Tanzania—have very low scores, signaling that governments still need to tackle fundamental problems in the financial sector. In some of the cases yet to be resolved the success of the restructuring efforts is at least questionable. For example, in Venezuela a comprehensive plan that addresses deficiencies in the banking system is still being adopted. Hungary's repeated recapitalization efforts may prove to be effective but at this point constitute a warning sign that underlying problems may not yet be resolved.

By contrast, Estonia's situation looks more promising, with the government sending the signal that losses will not be readily covered by the authorities. A new external and internal incentive system has depositors bearing the burden of losses and imposes tough exit requirements for banks. Among other transition economies Poland has made noteworthy improvements, especially evident in the increased technical capacity of Polish banks (partly a result of a twinning program with Western commercial banks) and in double-digit capital-asset ratios and relatively sophisticated workout units. Among developing countries Argentina has made considerable progress in bracing its banking system against shocks. This increased stability became evident during last year's "tequila" crisis, which the Argentine banking system weathered relatively well. Besides making progress on the macroeconomic front, the Argentine government has put in place a regulatory system with firm exit policies (seventy-six banks closed or merged in the past two years) and moved toward more market-based monitoring of the banking system by subjecting banks to greater disclosure requirements. In both Argentina and Poland the establishment and maintenance of incentive-compatible regulatory frameworks would likely put these countries among the ranks of our more successful cases.

Highlights of Four Cases

To draw solid lessons from countries' experiences with banking crisis and reform, enough time needs to have passed since the crisis for policy changes to have taken root. Here we look at four cases that range from clear success to clear failure. Chile and Malaysia can be considered among the more successful cases. Both countries experienced financial system deepening, moderate real credit growth, reasonable real deposit rates (that is, consistent with a healthy financial system), and no recurrent banking problems. Ghana's bank restructuring exercise achieved mixed results. The

financial system did not deepen in the aftermath of the restructuring, and real credit growth was below real GDP growth—both indicators of possible ongoing problems. But real deposit interest rates were moderately positive and therefore at a level consistent with a healthy financial system. The less positive cases can be attributed mainly to the government's failure to restructure state-owned enterprises, which accounted for many of the nonperforming loans, or to maintain macroeconomic discipline. Guinea's banking system restructuring in the 1980s was a clear failure. The ratio of M2 to GDP remained flat, real credit growth was excessive, real deposit rates reached double-digit levels in 1994, and the banking system experienced recurrent problems. The restructuring was unsuccessful because the government failed to implement an adequate accounting and regulatory framework and to bring the budget deficit under control.

Table 1. Evaluating the Restructuring Exercises

<i>Successful</i>	<i>Mixed results</i>	<i>Unsuccessful/not yet resolved/insufficient time</i>
<i>Africa</i>		
	Benin (1988-90) Côte d'Ivoire (1988-91) Ghana (1982-89) Madagascar (1988) Mauritania (1983-93) Senegal (1988-91) Zaire (1991-92)	Burkina Faso (late 1980s) Cameroon (1987-) Central African Republic (1980s and 1991) Chad (1980s and 1990s) Congo (1980s and 1991-) Guinea (1985) Kenya (1985-89) Mozambique (1987-) Nigeria (1990s) Tanzania (1987, 1995) Togo (1993-) Uganda (1994) Zambia (1995)
<i>Asia</i>		
Malaysia (1 985-88)	Bangladesh (late 1980s) Nepal (1988) Philippines (1981-87) Singapore (1982) Sri Lanka (1989-93) Taiwan, China (1983-84) Thailand (1983-87)	India (1994-) Indonesia (1994-) Japan (1990s)
<i>Latin America</i>		
Chile (1 981 -83)	Argentina (1980-82) Argentina (1989-90) Bolivia (1986-87) Colombia (1982-87) Mexico (1981 -91) Uruguay (1981-84)	Brazil (1994-) Costa Rica (several instances) Mexico (1994-) Paraguay (1995-) Venezuela (1 994-)
<i>Other</i>		
Australia (1989-90) Germany (late 1970s) United Kingdom (1974-76) United States (1984-91)	Egypt (early 1980s) Finland (1991-93) New Zealand (1987-90) Norway (1987-89) Romania (1990-93) Spain (1977-85) Sweden (1991-93) Turkey (1982-85)	Bulgaria (1990s) Estonia (1992-94) France (1994-95) Hungary (1991-) Latvia (1995) Lithuania (1995-96) Poland (1991-) Russia (1995) Slovenia (1990s)

Note: Countries were rated on the basis of four criteria: financial deepening, development of real credit, real deposit interest rates, and recurrence of problems after banking sector restructuring.
Source: Caprio and Klingebiel 1996.

While Malaysia's restructuring affected only a small portion of the banking system, almost all the banks in Guinea were bankrupt in 1985, with just one institution—accounting for 1 percent of financial system deposits—remaining open. In Ghana and Chile insolvent institutions controlled almost half of total assets. Interestingly, the two successes represent one of the smallest (Malaysia) and one of the largest (Chile) insolvency episodes in terms of resolution cost (Caprio and Klingebiel 1996).

In Guinea the resolution mechanism chosen was liquidation by the government, with large depositors forced to bear some of the losses. In Malaysia the authorities opted to merge insolvent deposit institutions with healthier ones and to inject capital into marginally solvent institutions (with support from current shareholders). In Chile and Ghana the government decided to restructure banks on a case-by-case basis by transferring a large part of nonperforming assets to the central bank (Chile) or to a special loan recovery agency (Ghana). In Chile the banks remained responsible for recovering loans and were required to buy back their loans from the central bank on a face-value basis.

By resolving incentive problems in the external and internal framework of banks, the Chilean and Malaysian authorities managed to stabilize their banking systems on a long-term basis. Increased disclosure figured prominently in Chile, including the requirement for two private ratings of banks each year and timely publication of information on their financial condition, with significant penalties for noncompliance (Brock 1992, pp. 199-216). In Malaysia, which has not featured greater disclosure requirements, the burden on supervisors is correspondingly greater. In both countries shareholders incurred losses and managers were fired, emphasizing the message that poor performance would be costly. Both Chile and Malaysia made efforts to contain or shrink macroeconomic imbalances—bringing the budget deficit under control, lowering inflation, and devaluing their currencies. Both countries also significantly improved their regulatory frameworks, brought accounting rules up to international standards, and strictly enforced the changes. To improve banks' internal incentives, the authorities in both countries barred banks from lending to borrowers in default, changed senior management in the restructured banks, and made attempts to collect on written-off loans.

By contrast, the authorities in Guinea and to a lesser degree in Ghana failed to address problems in the incentive structure of banks. In Guinea this inaction led to a second crisis less than a decade later, and the country still has not managed to reduce its budget deficit significantly. In Ghana macroeconomic control has eased since 1992, with potential adverse consequences for the banking system. Although Ghana was more successful than Guinea in adopting a stronger regulatory framework and tougher accounting standards, it is not yet clear how well these changes are being enforced. Ghana does, however, require its banks to undergo annual audits by outside auditors; the Guinean authorities have made no such provisions. It is not clear that Ghanaian or Guinean banks have halted lending to borrowers in default or made serious attempts to collect written-off loans. Although some change in management occurred in the Ghanaian banks, at least one bank manager just switched banks. A twinning arrangement with foreign banks was adopted, however. In Guinea the banks were liquidated, and no information is available on former managers.

An important question for future research, in particular given the crucial role of financial systems in economic development, is why so few countries have managed to cope successfully with bank insolvency. Answering this question will require in-depth

case studies of the political economy of bank resolution and restructuring. As with public enterprise reform, it will be important to see whether factors that influenced the desirability, feasibility, and credibility of reform can be identified in more and less successful cases (World Bank 1995).

Dealing with Crises: The Case for Inoculation

Though we have noted several factors, both macroeconomic and microeconomic, that have played a role in generating the large losses incurred by banking systems worldwide, it remains difficult to know when a banking system is having problems. Data often are poor and bank problems are easily disguised, so dating crises or engaging in causality testing is necessarily precarious. Moreover, bank insolvency often occurs when macroeconomic volatility is on the rise and when incentives appear to have weakened—not a good time to try to determine causality. When financial deregulation occurs at the same time it becomes a convenient target, though in many countries deregulation proceeded faster than improvements in financial infrastructure and incentives, suggesting that weak financial infrastructure and poor incentives led to the crises. Thus, although macroeconomic factors are important, microeconomic and incentive factors likely are key to determining the magnitude of banking problems and in some cases are even the main cause.

Developing a More Robust Regulatory Framework

The challenge, then, is to devise a regulatory framework that enables the banking system to be a more resilient absorber of shocks. Just as modern medicine cannot cure the flu but can lessen the consequences of severe cases, modern financial economics cannot, without risking the patient, devise an absolutely fail-safe banking system. Banks will face shocks, some banks will fail, and when the shocks are large and policy errors compound them, failures will become systemic. Moreover, the goal is not to have an absolutely safe banking system, but rather to have one that performs its intermediation function well, that is, that undertakes the funding of a diversified bundle of prudent risks. What a regulatory framework can and should do is support this function by providing bankers, shareholders, and perhaps depositors with the incentives to plan for shocks, in effect raising the shock threshold for producing a systemic banking problem. Once a problem occurs, the framework should encourage prompt recognition and early resolution, since delay usually leads to larger losses. That bankers have not routinely planned for larger shocks suggests that they have not had the incentive to do so. As the comparison between the Canadian and U.S. experiences highlights, it is quite possible to have a banking system that absorbs shocks rather than magnifies them.

There is no single model for a banking system that encourages bankers to engage in prudent risk taking. However, most countries need to move toward increasing the loss exposure of bankers through higher capital ratios, higher liability limits for bank owners, mutual liability (making groups of banks liable for member losses), or higher franchise values (making greater bank profitability the carrot that induces greater prudence)—all of which needs to be coupled with better information and better disclosure so that outsiders can effectively monitor banks. Bank managers who face a credible threat of removal for poor performance (and legal action, where warranted)

are more likely to behave prudently, as are bank owners who risk seeing their capital wiped out and their ability to control failed institutions ended. In addition, two plans developed by Chicago economists (some from the University of Chicago, some from the Chicago Federal Reserve) have been suggested to cure banking problems. The narrow banking plan, developed in 1933, would limit banks' investments to safe, highly liquid instruments, leaving other intermediation to less regulated institutions whose liabilities are not guaranteed. A more recent plan would require banks to issue concentrated amounts of subordinated debt, thereby creating a group of highly motivated investors to oversee banks and effectively serve as owners. Although these different proposals are interesting to debate (see Caprio 1996), no single recommendation is likely to be consistent with the institutions and political forces of all countries. But the goal—a regulatory framework that places greater emphasis on market forces—is the common thread of all these plans and is, in our view, the indispensable ingredient of a better banking system.

Are any of these options politically realistic? Large banking crises tend to make such options more appealing; the authorities in Argentina, Chile, Hong Kong, and the United States all improved incentive frameworks following banking crises. One way to improve the political appeal of better incentive systems is to make sure that some classes of bank liability holders have their own funds at risk. It may be unrealistic to limit deposit insurance to small deposits, since large deposit holders often wield significant political influence. But it may be possible to put some part of all depositors' funds at risk, thereby creating an interest group in favor of better supervision and regulation. Without such a motivated group, improvements in incentives may be temporary, since the memory of large crises often fades quickly and "dynamic" bankers become popular figures.

Even with an incentive-compatible regulatory framework, bad luck and bad macroeconomic policies cannot be eliminated, and they will occasionally threaten even the strongest banking system. Prompt action by current or potential owners, creditors, and supervisors will help limit losses and lead to a healthier financial system. But if a country's banking system is still threatened by even small shocks after incentives have been improved, its residents will avoid the formal banking system, a common occurrence in many small developing countries. Here the goal of reform should be to increase the size of the shock that will destabilize the banking system by allowing or even requiring banks in small economies to diversify. Most developing countries are small in terms of market size, and the smallest countries had the largest terms of trade declines (on the order of 20-86 percent, the largest in our sample) and the greatest volatility. Thus requiring banks to invest solely in their domestic economy weakens the banking system. This factor is more important for smaller and more concentrated economies, meaning that a greater role for foreign and regional banks must be fostered. Small economies need even better incentive frameworks and enhanced diversification.

A Role for the World Bank

Developing country banking systems are experiencing widespread problems that need to be dealt with since finance, particularly banking, is so important to long-run economic development (King and Levine 1993; Schiantarelli and others 1994). The World Bank and other multilateral institutions clearly must do something. The size of banking system losses shows that resources are being misallocated on a large scale and that growth is being commensurately reduced. And because governments are devoting funds to fixing banking problems, these funds are not available for health, education, or other programs. Because incentives are a large part of the problem, however, major financial sector lending is not recommended unless developing country authorities adopt a more incentive-compatible regulatory framework. Thus the World Bank may well have to reject requests for financial sector loans when countries' banks are insolvent.

For countries not yet ready to significantly upgrade their incentive framework— and here there is room for judgment in determining how much action is enough— more emphasis is needed on building financial infrastructure (accounting, auditing, legal systems, banking and supervisory skills) and educating member countries on the need for incentive reform. These efforts will allow banks to better screen and monitor their clients and more easily enforce contracts. Encouraging the elimination of real sector distortions, a major goal of the past decade of World Bank lending, will reduce erroneous signals about the long-term viability of projects and borrowers.

Constructing a long-term (at least ten-year) plan for a country's financial system should be an integral part of the World Bank's financial sector lending strategy. If all World Bank work in the financial sector began with a review of how incentives are working in the financial system and how any proposed program would alter them (an incentives impact statement, if you will), more effective assistance over the medium term likely would result. Moreover, the World Bank needs to be more effective in gathering data on banking and on banks' clients, not just to predict upcoming crises but also to evaluate the impact of its financial sector interventions. Without firm-level data on banks' clients, accurate evaluation of financial sector interventions is impossible.

To be sure, no one endorses lending into a poor incentive framework. The point here is that merely encouraging governments to adopt an 8 percent capital adequacy ratio and to improve bank supervision is not sufficient. Developing countries face larger volatility than industrial countries, their economies are more concentrated, and they face sizable hurdles (as do industrial countries) in effectively supervising banks. If the World Bank limited itself to a few financial sector operations in countries with significantly improved incentive frameworks, it likely would increase the number of clear success cases both directly and, through imitation, indirectly.

A difficult but necessary change is that the World Bank must be willing to tell a country that it is simply too small to have its own banking system, if by that the authorities mean one solely or principally composed of domestic banks investing in the home economy. In very small economies the required incentive system would be difficult to achieve without foreign diversification. Thus promoting a greater role for foreign banks, including regional banking, is needed—a difficult idea to sell in many countries.

More research would help to determine how much diversification is needed and how to diversify safely. Another interesting research question is how much the regulatory system needs to favor more conservative banking before the growth-reducing effects of this approach outweigh the savings from sounder banking. At present there is neither sufficient variation in regulatory practice nor accurate enough information on banking to evaluate this issue. It appears safe to say, however, that most countries suffer from excessively imprudent banking because of governments' willingness to underwrite losses, making the exposure of bank owners quite low. Research on how outcomes in the banking sector vary with the scope of deposit insurance coverage would be particularly useful, as would an effort to better understand the political economy of bank restructuring. With reliable data, research also could shed light on the interactions among concentration of bank portfolios, volatility of asset prices, and prudent capital-asset ratios.

Achieving better banking will require the use of both carrot—in the form of profitable opportunities for banking—and stick—such as prompt replacement of bad managers, substantial losses for (and replacement of) owners, and more mobile deposits. Such mechanisms will ensure that bankers take risks, but only risks that are prudent. The breadth and depth of banking problems reviewed in this article suggest that bigger carrots and bigger sticks are needed. If there is a bright side to this experience, it is that authorities and citizens, being better informed about the scope of the problems, might be more apt to reconsider the rules of the game in banking now than at any time in recent history. The challenge to the development community is to not let this opportunity pass without an effective response.

Notes:

1. Figures for losses are hard to come by and estimates range considerably. In many cases there are no clear, uniform accounting standards; banks can disguise losses for some time by granting additional credit, losses can be apportioned to a variety of groups, and governments can pay for losses in a variety of ways, from injecting funds directly into insolvent banks to helping the borrowers (such as with cash, import licenses, monopoly power, and so on). See Marshall and Schmidt-Hebbel (1994) and Rodriguez (1994) for the higher estimates and Rojas-Suárez and Weisbrod (1995) for the lower ones. The main difference is that the higher estimates attempt to capture the entire fiscal cost, including exchange rate subsidies, while the lower estimates include only funds, credit, and bonds injected directly into the commercial banks.
2. Background data for this article is presented in Caprio and Klingebiel (1996).
3. A fire sale is more likely if the bank or banks in trouble hold a significant portion of an asset, such as in the case of a small town bank's real estate portfolio or Japanese banks' holdings of land and buildings, since the asset sale will then have a significant impact on prices. In the absence of explicit deposit insurance, depositors may even lose from fire sale losses—that is, initial losses can induce banks to dump good assets on the market to pay off early depositors, leading to lower prices for these good assets, more depositors demanding redemption of their funds, and so on.
4. Between 1865 and 1919 an average of 64 U.S. banks failed each year, with a standard deviation of 71 (Benston and others 1986, p. S8). These figures rose to 1,070 and 966, respectively, between 1920 and 1933. For the most part these were small banks, with only a tiny fraction of deposits affected. Limits on nationwide branching directly contributed to the large number of failed institutions—at their peak in 1920, there were 30,000—and their individual fragility. In other industrial countries and in developing economies the regulatory

structure permits or encourages far fewer banks, so the failure of one or a few is likely to have more significant effects on the financial system.

5. Nonperforming loans are those for which interest payments are in arrears by a certain number of days. Although there is no internationally recognized standard for this time limit, bank supervisors often use ninety days. Loan losses are the actual loss on loans that are written off by banks, which is the outstanding loan amount less the value of what is recovered (including any collateral) minus collection expenses.

6. Because there are no comparable capital ratios or provisioning systems for developing country banks, this statement is based on impressions gathered from developing country officials, banking consultants, and World Bank staff. Note that not only is deciding on whether an episode is systemic difficult in a private banking system, but in countries with a significant proportion of bank assets in state-owned banks, capital in the banks may be little more than an assumed claim on the treasury. Although the incentive system may be different in public and private banks, bureaucrats often engage in the same cover-ups of bad loans that private bankers have employed. Finally, as bank capital ratios rise, as they have in the 1990s, this definition will have to be revised.

7. In cases where net capital was positive according to official data but negative based on statements of experts, we sided with the experts. Decisions on when one crisis ends and another begins are necessarily arbitrary; hence it is possible to differ on whether some cases represent multiple crises or a continuation of the preceding one. Although it would be possible to use the indicators of success (see the next section) to determine the end of a crisis, that would mean that many cases would involve ongoing crisis.

8. Kryzanowski and Roberts (1993) argue that some or all Canadian banks were insolvent but were kept open by the government's implicit guarantee. This case is difficult to prove because banking operations generally are opaque and because Canada's banking system historically relied on mutual liability and a relatively small number of nationwide banks.

9. Thus the finding by the U.S. Comptroller of the Currency, the U.S. Federal Deposit Insurance Corporation, and others that fraud and violations of the law figured prominently in U.S. bank failures from the 1860s to the 1970s may merely capture the final stages of a drama in which initial losses were magnified.

10. Clearly, it would be optimal to have a longer time series of data on the precise size of bank crises and then to investigate the relationship between the size of the crisis and the change in and volatility of the terms of trade. It would then be possible to say whether greater volatility in the terms of trade led to more or more costly bank insolvency. Although we do not have such information, the data in figure 2 are at least persuasive.

11. Because the data underlying the descriptions in figure 3 are drawn from a wide variety of sources familiar with the sample countries and their financial systems, the descriptions it uses are somewhat generalized. Poor supervision or regulation is used to denote easy entry, little or no information gathering on bank solvency on the part of the supervisory agency, or no follow-up even if useful information was collected. In many cases deficient management refers to little or no monitoring of borrowers, few internal controls, or basic asset-liability mismatches. Connected or politically motivated lending and fraud need no elaboration.

12. A credit crunch may arise in response to several events: a run on deposits that, if not offset by monetary policy, forces a contraction in total assets and total lending; a postcrisis tightening of regulatory capital requirements; because the resolution mechanism reduces the banking system's information capital; or as a voluntary response to a reduction in the banking system's capital cushion or an increase in the risk of its current portfolio.

13. Positive but moderate real rates do not necessarily mean that there is no financial distress, since they may be restrained by official or informal controls.

References

- Akerlof, George A., and Paul Romer. 1993. "Looting: The Economic Underworld of Bankruptcy for Profit." *Brookings Papers on Economic Activity* 2. Washington, D.C.: Brookings Institution.
- Baer, Herbert, and Daniela Klingebiel. 1994. "Systemic Risk When Depositors Bear Losses: Five Case Studies." In George G. Kaufman, ed., *Banking, Financial Markets, and Systemic Risk*. Greenwich, Conn.: JAI Press.
- Barth, James R., and Philip R Bartholomew. 1992. "The Thrift Industry Crisis: Revealed Weaknesses in the Federal Deposit Insurance System." In James R. Barth and R. Dan Brumbaugh, eds., *The Reform of Federal Deposit Insurance*. New York: Harper.
- Barth, James R., Philip F. Bartholomew., and Carol J. Labich. 1989. "Moral Hazard and the Thrift Crisis: An Analysis of the 1988 Resolutions." In Federal Reserve Bank of Chicago, ed., *Proceedings of the 25th Annual Conference of Bank Structure and Competition*. Chicago: Federal Reserve Bank of Chicago.
- Bartholomew, Philip E, Larry R. Mote, and Gary Whalen. 1995. "The Definition of Systemic Risk." U.S. Office of the Comptroller of the Currency, Department of Economic and Policy Analysis, Bank Research Division, Washington, D.C.
- Benston, George J., Robert A. Eisenbeis, Paul M. Horvitz, Edward J. Kane, and George G. Kaufman. 1986. *Safe and Sound Banking: Past, Present, and Future*. Cambridge, Mass.: MIT Press for the American Bankers Association.
- Bernanke, Ben. 1983. "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *American Economic Review* 73(3): 257-76.
- Blass, Asher A., and Richard S. Grossman. 1995. «A Costly Guarantee? The 1983 Israel Bank Shares Crisis Revisited." Discussion Paper 95.05. Maurice Falk Institute for Economic Research in Israel, Jerusalem.
- Bordo, Michael. Forthcoming. "Regulation and Bank Stability: Canada and the United States, 1870-1980." In Gerard Caprio, Jr. and Dimitri Vittas, eds., *Reforming Finance: A Historical Perspective*. Cambridge: Cambridge University Press.
- Borish, Michael S., Millard F. Long, and Michel Noel. *Enterprise and Bank Restructuring: Recent Losses from Transition Countries*. World Bank Discussion Paper 279. Washington, D.C.
- Brock, Philip, ed. 1992. *If Chile Were Texas: A Primer on Banking Reform*. San Francisco, Calif.: Institute for Contemporary Studies Press.
- _____. 1995. "High Real Interest Rates and Bank Recapitalizations." University of Washington, Department of Economics, Seattle.
- Calomiris, Charles W. 1989. "Deposit Insurance: Lessons from the Record." Federal Reserve Bank of Chicago *Economic Perspectives* (May/June): 10-30.
- _____. 1992. "Do 'Vulnerable' Economies Need Deposit Insurance? Lessons from U.S. Agriculture in the 1920s." In Philip L. Brock, ed., *If Chile Were Texas: A Primer on Banking Reform*. San Francisco, Calif.: Institute for Contemporary Studies Press.
- Calomiris, Charles W., and Gary Gorton. 1991. "The Origins of Banking Panics: Models, Facts, and Policy Regulation." In R. Glenn Hubbard, ed., *Financial Markets and Financial Crises*. Chicago: University of Chicago Press for the National Bureau of Economic Research.
- Caprio, Gerard Jr. 1992. "Policy Uncertainty, Information Asymmetries, and Financial Intermediation." Policy Research Working Paper 853. World Bank, Washington, D.C.
- _____. 1996. "Bank Regulation: The Case of the Missing Model." Policy Research Working Paper 1574. World Bank, Washington, D.C.
- Caprio, Gerard Jr., and Daniela Klingebiel. 1996. "Bank Insolvencies: Cross-Country Experience." Policy Research Working Paper 1620. World Bank, Washington, D.C.
- Caprio, Gerard Jr., Izak Atiyas, and James Hanson, eds. 1994. *Financial Reform: Theory and Experience*. Cambridge: Cambridge University Press.

- Davis, E. P. 1992. *Debt, Financial Fragility, and Systemic Risk*. New York: Oxford University Press.
- de Juan, Aristobulo. 1987. "From Good Bankers to Bad Bankers: Ineffective Supervision and Management Deterioration as Major Elements in Banking Crises." World Bank, Financial Policy and Systems Division, Washington, D.C.
- Fetter, Frank W. 1931. *Monetary Inflation in Chile*. Princeton, N.J.: Princeton University Press.
- Fleming, Alex, and Samuel Talley. 1996. "The Latvian Banking Crisis: Lessons Learned." Policy Research Working Paper 1590. World Bank, Washington, D.C.
- Garcia, Gillian. 1995. "Deposit Insurance: Obtaining the Benefits and Avoiding the Pitfalls." International Monetary Fund, Monetary Affairs and Exchange Department, Washington, D.C.
- Gavin, Michael, and Ricardo Hausmann. 1996. "The Roots of Banking Crises: The Macroeconomic Context." In Ricardo Hausmann and Liliana Rojas-Suárez, eds., *Banking Crises in Latin America*. Baltimore, Md.: Johns Hopkins Press.
- Gorton, Gary. 1988. "Banking Panics and Business Cycles." *Oxford Economic Papers* 40(4): 221-55.
- Guttentag, Jack. 1994. "Debt, Financial Fragility, and Systemic Risk: A Review." *Journal of Economic Literature* 32 (September): 1238-40.
- Haubrich, Joseph G. 1990. "Nonmonetary Effects of Financial Crises: Lessons from the Great Depression in Canada." *Journal of Monetary Economics* 25: 223-52.
- Keeley, Michael C. 1990. "Deposit Insurance, Risk, and Market Power in Banking." *American Economic Review* 80(5): 1183-1200.
- Kindleberger, Charles Poor. 1978. *Manias, Panics, and Crashes: A History of Financial Crises*. New York: Basic Books.
- King, Robert, and Ross E. Levine. 1993. "Finance, Entrepreneurship, and Growth: Theory and Evidence." *Journal of Monetary Economics* 32: 513-42.
- Kryzanowski, Lawrence, and Gordon S. Roberts. 1993. "Canadian Banking Solvency, 1922-1940." *Journal of Money, Credit, and Banking* 25 (August): 361-76.
- Marshall, Jorge, and Klaus Schmidt-Hebbel. 1994. "Chile: Fiscal Adjustment and Successful Performance." In William Easterly, C. A. Rodriguez, and Klaus Schmidt-Hebbel, eds. *Public Sector Deficits and Macroeconomic Performance*. New York: Oxford University Press.
- Minsky, Hyman P. 1982. *Can 'It' Happen Again: Essays on Instability and Finance*. Armonk, N.Y.: M.E. Sharpe.
- Mishkin, Frederic S. 1991. "Asymmetric Information and Financial Crises: A Historical Perspective." In R. G. Hubbard, *Financial Markets and Financial Crises*. Chicago, Ill.: University of Chicago Press.
- Morris, Felipe, Mark Dorfman, Jose Pedro Ortiz, and Maria Claudio Franco. 1990. *Latin America's Banking System in the 1980s*. World Bank Discussion Paper 81. Washington, D.C.
- Rodriguez, Carlos Alfredo. 1994. "Argentina: Fiscal Disequilibria Leading to Hyperinflation." In William Easterly, C. A. Rodriguez, and Klaus Schmidt-Hebbel, eds., *Public Sector Deficits and Macroeconomic Performance*. New York: Oxford University Press.
- Rojas-Suárez, Liliana, and Steven Weisbrod. 1995. "Banking Crises in Latin America: Experiences and Issues." In Ricardo Hausmann and Liliana Rojas-Suárez, eds., *Banking Crises in Latin America*. Baltimore, Md.: The Johns Hopkins University Press.
- Schiantarelli, Fabio, Izak Atiyas, Gerard Caprio, Jr., John Harris, and Andrew Weiss. 1994. "Credit Where it is Due? A Review of the Macro and Microeconomic Evidence on the Real Effects of Financial Reform." In Gerard Caprio Jr., Izak Atiyas, and James Hanson, eds., *Financial Reform: Theory and Experience*. New York: Cambridge University Press.
- Sheng, Andrew, ed. 1996. *Bank Restructuring: Lessons from the 1980s*. Washington, D.C.: World Bank.

- Simons, Katerina, and Stephen Cross. 1991. "Do Capital Markets Predict Problems in Large Commercial Banks?" *New England Economic Review* (May/June): 51-6.
- Sundararajan, Vasudevan, and Tomas Jose T. Balino, eds. 1991. *Banking Crises: Structural Weaknesses, Support Operations, and Economic Consequences*. Washington, D.C.: International Monetary Fund.
- Weisbrod, Steven R., Howard Lee, and Liliana Rojas-Suárez. 1993. "Bank Risk and the Declining Franchise Value of the Banking Systems in the United States and Japan." IMF Working Paper 92/45. International Monetary Fund, Washington, D.C.
- White, Eugene. Forthcoming. "Deposit Insurance." In Gerard Caprio Jr. and Dimitri Vittas, eds., *Reforming Finance: A Historical Perspective*. Washington, D.C.: World Bank.
- World Bank. 1989. *World Development Report 1989: Financial Systems and Development*. New York: Oxford University Press.
- _____. 1995. *Bureaucrats in Business: The Economics and Politics of Government Ownership*. A Policy Research Report. New York: Oxford University Press.