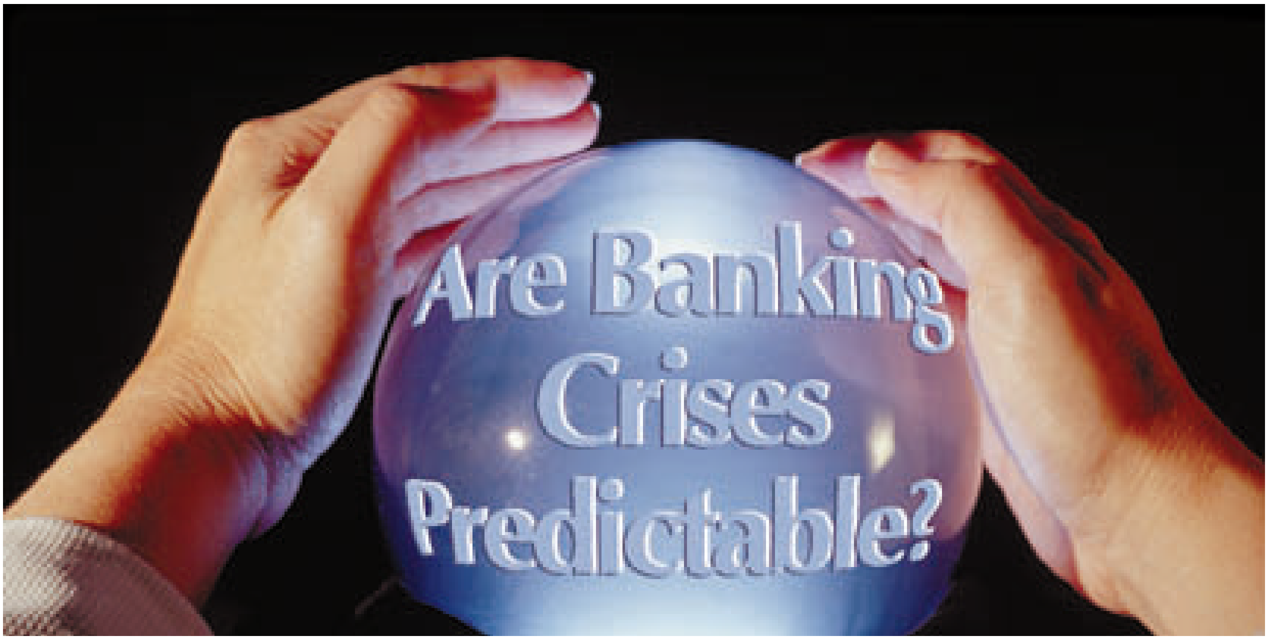

Are Banking Crises Predictable?

Many countries have experienced financial sector distress at some time. Although bank failures can come as a surprise, information is often available that can signal a banking system's vulnerability to crisis.

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STRAINS and disturbances anywhere in an economy are likely to have repercussions on the banking system. Because of the nature of the business, banks are exposed to many potential sources of danger: reliance on deposits many times larger than their capital, uncertain claims on different sectors of the economy, assets that are longer term and less liquid than liabilities, and, for banks involved in international transactions, assets and liabilities denominated in different currencies. To these variables should be added the possibility that problems will originate within the banking system itself, perhaps because of lax internal controls or poor management. When a bank is facing possible bankruptcy, its owners and managers may take greater risks if they expect to avoid being held accountable. As a result, problems that can ordinarily be contained may be magnified, and sooner or later the banking system will run into difficulties. Furthermore, complex relationships and mutual dependency typically develop between banks and their clients, as well as among banks, so that difficulties that are initially localized can spread throughout the banking sector and into the economy as a whole.

Ultimately, the institutional and structural features of an economy and, in particular, its banking sector will determine its susceptibility to crisis. The government—including the central bank and the regulatory and supervisory authorities—plays an important role in establishing the legal and institutional framework. It must implement adequate prudential supervision and regulation, which includes requiring banks to address problems as soon as they emerge. The government is also responsible for ensuring that accounting and auditing practices meet certain standards so that banks cannot mask problems, such as a high proportion of nonperforming loans, until they become unmanageable. Accounting standards in enterprises and nonbank financial institutions also need to be rigorous enough to ensure that their creditworthiness can be assessed. Laxity in these areas increases the likelihood of widespread banking sector distress.

Although these structural factors may make it easier to identify which countries are more likely to experience a banking crisis eventually, they provide little indication of when one might occur. Under favorable circumstances, a country with poor institutional arrangements can coast for a long time without serious banking sector difficulties, but when the environment deteriorates, a crisis can emerge very rapidly.

History of banking crises

Given these myriad vulnerabilities, it is not surprising that banking crises have a long history. The Great Depression of the 1930s was exacerbated by bank failures in the United States and elsewhere. In recent decades, a large number of countries have experienced financial distress of varying degrees of severity, and some have suffered repeated bouts of distress.

In the early 1980s, the governments of several Latin American countries, including Chile and Mexico, felt compelled to make up for losses in the banking system—for instance, by buying substandard loans from the banks for more than their true worth—to preserve its solvency. During the 1980s and 1990s, many African countries also had to restructure and recapitalize their banking systems, which in the past had suffered large losses on loans to parastatal companies (companies at least 50 percent owned by the state) and on crop loans. In the late 1980s, the performance of banks in certain advanced industrial countries, particularly in the Nordic countries, deteriorated to the point where governments had to support some of the largest banks to preserve financial stability. In almost all the transition countries—those that transformed their economies from a command system to a market-based system—major banks incurred large losses as a result of high and fluctuating inflation and the loss of traditional enterprise clients. Current events in East Asia have reminded the world once again of how rapidly and forcefully banking crises can erupt and of how difficult it is to anticipate the full ramifications of these dramatic events. In all cases, banking crises resulted, at a minimum, in large losses of wealth and disruptions in the supply of credit for investment and commerce. Resolving the crises often involved large outlays of public funds.

These grave consequences underscore the value of predicting banking crises or, at least, identifying them rapidly and analyzing events as they occur so as to be prepared.

Leading indicators of distress

Even when a banking crisis appears to strike like a bolt from the blue, it will normally have had a long gestation period. Information is usually available that, when carefully sifted, can give a fair indication of the vulnerability of the banking system to crisis. To be able to predict the timing of a banking crisis or to say, at least, when the risk of a crisis is high or low, one must identify reliable indicators and monitor them for changes. A useful indicator is a variable that can be readily tracked and that behaves one way when the banking system is not under pressure and a distinctly different way when the system is subjected to pressure. Ideally, the behavior of an indicator should provide a measure of the degree of risk or should hint at the likely timing of the emergence of problems in the banking system. Once bank distress is apparent, developments in contemporaneous indicators can say something about the severity and ramifications of the problem.

Variables that are useful as indicators do not necessarily stand in any simple causal relationship to banking crises. One indicator might measure a certain aspect of banking system distress, such as bank losses. Another might capture the evolution of a shock to the economy caused, say, by changes in the terms of trade, which will affect the profitability of exporting industries and the level of government revenues and expenditures and, indirectly, the banking system. A third might capture some consequence of banks' incipient difficulties, say, a widening spread between deposit and lending rates. Often, fluctuations in indicator variables and the emergence of problems in the banking sector are both the product of some third, underlying influence. For example, banks may start rolling over loans to a loss-making industry and capitalizing interest in the hope of an eventual turnaround or bailout by the government. A rapid increase in loans to one sector may indicate that banks are resorting to such measures, which in the end are likely to result in large and explicit bank losses.

Useful indicators can come from various sources and relate to various aspects of the economy. Some may come from the banking system itself and some from other sectors, while others may be macroeconomic.

Banking sector indicators. The most obvious indicators that can be used to predict banking crises are those that relate directly to the soundness of the banking system. Items from banks' balance sheets or statements of revenue and expenses may make clear when risks are increasing and, thus, when problems are emerging. These variables may even be available at the level of individual banks, where systemwide distress often originates; the deterioration of individual institutions may not be apparent in aggregate data.

The primary direct indicator of banking sector soundness and the likelihood of difficulties is *the level of bank capitalization*, that is, the amount by which a bank's assets exceed its liabilities. Capital acts as a cushion against shocks and allows a bank to continue honoring claims even when the value of some of its assets drops. The amount of capital that a bank should hold depends primarily on the riskiness of its assets. Certain assets, such as loans to enterprises, are inherently more likely to become impaired than, for example, cash and reserves held with the central bank. A bank will clearly need a higher level of capitalization if it lends mostly to industries that are subject to large fluctuations in output and profitability caused by external events or if it operates in an environment of high and variable inflation.

Changes in banks' capitalization, especially as revealed in their profitability, can be as telling as their level of capitalization. A rapid erosion of banks' capital as they absorb mounting losses is both a signal and a component of banking system distress. Even if banks continue to make a profit, a rapid increase in *the share of loans that are nonperforming or impaired* is a clear danger signal. Deteriorating loan quality has been at the core of most systemic banking crises. The level of nonperforming loans is thus a key indicator of the magnitude of banks' difficulties, even if banks themselves tend to be overoptimistic in their assessment of repayment prospects.

Shifts in the structure of banks' balance sheets can also be informative and may provide an earlier warning than will data on losses that have already occurred. In some instances, banking crises seem to have been preceded by a rapid buildup of loans to particular sectors. The commercial real estate sector is especially prone to cycles of rising prices, overinvestment, and heavy borrowing, followed by a slump. This phenomenon contributed to the savings and loan debacle in the United States in the 1980s and to various episodes of banking sector difficulties in the United Kingdom—for instance, in 1973–75 and in the early 1990s.

Another significant indicator may be *a rapid change in the maturity structure of banks' assets and liabilities*, especially if it is combined with differences in the currency denominations of assets and liabilities at each maturity. Increasing reliance on short-term funding of relatively long-term assets makes a bank more vulnerable to changing attitudes toward either the banking system as a whole or that particular institution. Such a widening maturity mismatch may also imply that the difficulties a bank has recently experienced will soon affect its ability to meet the claims of its creditors, thus spreading the contagion more rapidly.

These microeconomic, often bank-specific indicators can be of great value, but, unfortunately, are not always available. The data that are available may be of poor quality, either because the institutional arrangements are not in place to produce reliable data even in the best of circumstances or because bankers and their borrowers have a strong incentive to present a rosy picture of their situation (especially when that situation is deteriorating). Hence, outside observers will have to rely more on macroeconomic, aggregated data or on prices available from the market, such as exchange rates.

Macroeconomic indicators. A number of recent studies have explored whether macroeconomic data—such as those typically published in a central bank bulletin—can be used as leading or coincident indicators of banking difficulties. The results generally suggest that these variables are indeed worth watching closely. Although they are far from fully reliable, they do indicate when trouble may be brewing, and they are mostly widely and rapidly available.

The evidence shows that certain macroeconomic variables typically display a distinctive pattern both in the lead-up to an episode of banking system distress and while the episode is unfolding. Overall, the pattern is that of a rapid end to a boom: after rising rapidly, real GDP, consumption, and, especially, investment start to decline; an acceleration in inflation is suddenly reversed; credit from the banking system to the private sector builds up rapidly, peaks, and then contracts; real interest rates increase steadily; and the real effective exchange rate appreciates and then depreciates. In the lead-up to a crisis, banks often rely increasingly on foreign borrowing, which then dries up.

At least as many countries have experienced serious but contained distress in their banking sectors as have suffered full-blown crises that put their solvency in doubt. For example, when the banking systems in the Nordic countries came under strain in the early 1990s, the problems in Denmark were spread among many small banks, while, in Sweden, several major banks received substantial government assistance. A comparison of experiences in the past two decades suggests that the indicators that are most useful in foretelling a full-blown banking crisis are not of equal value in signaling an episode of less systematic and less profound banking sector distress. Declining output, an increase and then a decrease in inflation, and a fall in the real effective exchange rate tend to accompany all banking sector difficulties, whatever their degree of severity. However, it appears that banking crises are often preceded by an unsustainable increase in investment funded in large measure by an inflow of foreign capital through the banking system. A marked characteristic of the onset of crisis is the contraction in banks' foreign borrowing. In contrast, a boom in consumption and bank lending, together with rising real interest rates, often precedes a more limited episode of banking sector distress, which emerges when this boom comes to an end.

These patterns suggest that certain external developments —in particular, heavy reliance on foreign borrowing—can magnify the effect of a negative shock to the system and contribute to the development of a crisis. The causation, though, can also go in the other direction: a very large banking system crisis may itself precipitate an external crisis.

Variations in country experiences

The general "boom and bust" pattern described above does not fit every case. The current East Asian crisis, for example, differs in important ways from the crises that have hit most transition countries and may also differ significantly from recent episodes of banking distress in Europe, Latin America, and countries (many of them in Africa) that rely on the export of primary products.

In recent episodes of banking crisis or distress in East Asia, both the real effective exchange rate and banks' foreign borrowing displayed an exceptionally sharp boom and bust cycle just before and during the onset of a crisis. In these cases, the contemporaneous indicators are very telling, and macroeconomic behavior in the crisis period itself is different from that in previous periods. It would have been difficult, however, to predict these events significantly in advance on the basis of macroeconomic variables alone.

The pattern in countries that rely heavily on exports of primary products is different. The onset of banking sector difficulties in these countries is typically preceded by a worsening of the terms of trade—that is, by declining commodity prices—which not only affects the profitability of some of the largest industries but also reduces government revenue, weakens domestic demand, and threatens the profitability of all enterprises. In these countries, the role of the terms of trade as a leading indicator makes banking problems relatively predictable, whereas fluctuations in inflation and domestic demand seem to be much less relevant to judging the probability of a banking crisis.

Conclusion

For some time, the IMF and the World Bank have been paying increasing attention to variables that may signal incipient banking system distress, studying the institutional structure of countries' financial systems more carefully to spot where weaknesses might lurk and to look for ways to correct them. They gather and analyze quantitative data on countries' banking systems for signs of deteriorating soundness and examine macroeconomic variables in new ways to assess the implications of their behavior for the likelihood of banking sector difficulties.

The IMF and the World Bank certainly will do more. They will scrutinize recent events in Asia to identify what other warning signs should have been heeded. In many countries, they will examine disaggregated data more closely and pay more attention to accounting and data dissemination standards. Ultimately, though, no indicator, or set of indicators, is wholly reliable as an instrument of prediction. Some bank failures will continue to come as a surprise. There will also be periods when a banking crisis appears to be imminent but does not occur, because of either skillful action by the government or sheer luck. Still harder to predict is the exact timing of the onset of a crisis, when a simmering problem boils over. This very uncertainty, however, reinforces the need for vigilance and the preparation of contingency measures to deal decisively with banking sector problems as they emerge. Attempting to predict possible banking crises is the starting point, not only for preempting them but also for resolving them with the least cost to society. F&D

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