

# Dealing with Financial Instability: The Central Bank's Tool Kit

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**QUESTIONS FOR DISCUSSION:** *Given that substantial financial imbalances are detected with sufficient certainty, what tools would authorities use in order to counteract these imbalances? Are measures necessary in order to make moral suasion a more credible tool? If the interest rate is used as a tool to induce financial stability, how can this be communicated without adversely affecting public confidence in monetary policy?*

## **I. Introduction**

This note identifies a dozen tools available to central banks for dealing with financial instability. These tools are grouped into three categories: targeted actions, generalized actions, and informational tools. Targeted actions are aimed at individual institutions or small groups of institutions. Generalized tools have effects that work through the whole economy. Informational tools are based on the transfer of information: either collection of intelligence by the central bank or dissemination of information by the central bank in the form of public communication. Each individual tool is discussed in section II.

We then consider in section III issues of central bank credibility and public confidence. If the central bank wants to use moral suasion – a minimalist tool – how can it ensure that it will be effective? The key is credibility. If the central bank has several potentially conflicting objectives, how can it communicate the reasons for its actions? Here the keys are both credibility and transparency.

Finally, section IV takes a look at the use of the tools in practice. We examine twenty cases since 1965 in which central banks have used the dozen tools to deal with problems that had possible systemic implications. Which tools were used in each case? Which tools were most popular? Were the results satisfactory? Did credibility and public confidence hold up?

## **II. The central bank's tool kit**

This section describes a dozen tools available to central banks for dealing with crises that have the potential to cause systemic disruptions. The list is probably not exhaustive, but

hopefully touches on the principal elements in the central bank's toolkit. The list is divided into three sections, corresponding to tools that are (1) targeted at individual institutions, (2) aimed at the market in general, and (3) based on the transfer of information.

#### A. Targeted tools

These tools are aimed at dealing with individual institutions. If systemic problems are driven by a few important institutions, or if a generalized problem affects many individual institutions, targeted tools may be very helpful in containing the effects of the problems. A list of some of these targeted tools follows.

##### *Bank supervision*

Traditionally, bank supervision has been one of the main tasks under the purview of central banks. Today, however, in a large and increasing number of countries, the central bank is not the entity primarily responsible for bank supervision. Supervision is included in this survey, however, because in most jurisdictions central banks remain involved in supervisory issues, if not in direct supervision. Bank supervision is targeted at individual institutions, even though many of the concerns associated with supervision are systemic in nature. For example, one goal of supervision may be to avoid large-scale disruptions to the credit system. To accomplish that goal, however, supervisory agencies take a detailed look at particular institutions that may trigger or exacerbate such an event.

##### *Legal action*

In many cases, it is difficult to determine the exact boundary between bank supervision and legal action. Supervisory agencies, including some central banks, have a series of enforcement actions at their disposal, many of them involving judicial proceedings. For the present purposes, legal action is considered as an extreme measure in which an institution is brought by the supervisory authority before the judicial system.

##### *Discount window lending*

The primary purpose of discount window lending and similar facilities is to deal with short-term liquidity problems. For various reasons, a bank or other financial institution may find itself hard-pressed to finance its ongoing operations, and the discount window may step in. In general, this action follows an assessment of the borrowing institution by the central bank, in which the bank is deemed to be solvent and therefore capable of repaying the loan. Improper credit controls in discount window lending may create a moral hazard problem.

##### *Recapitalization of institution*

Recapitalization is a much more extreme measure than discount window lending. In this case, the institution in need of financing is assessed to be either insolvent or so poorly capitalized that it cannot sustain itself without an infusion of external capital. Clearly, moral hazard is more of a problem in this case, and this is a tool that tends to be used very sparingly in actual practice.

### *Deposit insurance*

Deposit insurance is generally not a function of the central bank per se. It is included here, however, for two reasons. First, when the central bank is the supervisory authority, it is forced to act very closely with the deposit insurer in dealing with financial crises. Second, even if the central bank is not the supervisor, it may rely explicitly or implicitly on deposit insurance as a backstop in case of an unavoidable crisis. As in the cases of discount lending and recapitalization, there are well-known moral hazard issues with deposit insurance.

### B. Generalized tools

In contrast to the targeted tools, generalized tools affect the financial markets in general. They may not be effective in dealing with a problem affecting only a few institutions, but may be extremely helpful when quick action is needed with regard to many institutions at once.

### *Open market operations*

Through open market operations, the central bank can inject liquidity into financial markets, particular at the short end of the maturity spectrum. The effects of such injections can be eventually felt in most sectors of the financial markets, and even in the real economy. However, it is almost impossible for the central bank to direct such effects at particular targets.

### *Foreign exchange intervention*

Intervention in the foreign exchange markets, like open market operations, is designed to affect markets, not institutions. In fact, the effects of foreign exchange intervention can be so diffuse that it has been questioned whether they are material at all. This is particularly the case with sterilized intervention, in which domestic market operations attempt to undo effects on the domestic economy. Nevertheless, it is possible that foreign exchange intervention by the central bank may minimize the consequences of short-term disruptions in the market.

### *Payments system action*

Banks and other financial institutions are not only credit intermediaries, but also have a key role in the payments system. A disruption to any institution that plays a large role in payments, or to many small institutions, has the potential to paralyze the system, with disastrous consequences. The central bank may deal with such disruptions by monitoring the system, by trying to ease bottlenecks, and by direct management of large payments crises.

### C. Informational tools

These tools differ among themselves according to the direction of the flow of information. In some cases, information flows to the central bank, which helps it deal with problem situations. In other cases, the key is the sharing of information among agencies with the capacity to deal with a crisis. Finally, the central bank can help

disseminate information that may ease market pressures or may lead market participants to take welfare-enhancing steps.

### *Market monitoring*

In order to perform its various tasks, it is essential for the central bank to monitor markets: to collect market intelligence even in markets in which it does not have a direct supervisory or regulatory mandate. This principle applies whether or not the central bank has explicit supervisory authority over the banking system. This type of market monitoring can provide early warnings of systemic problems, can generate useful information when the central bank needs to take specific steps to deal with a crisis, and can help determine whether a crisis has subsided once actions are taken. Market monitoring may focus, for example, on the performance of individual institutions, on the performance of a sector as a whole, and on movements in prices in various financial markets.

### *Inter-agency cooperation*

Cooperation among official agencies is generally of the utmost importance in the resolution of financial crises. Collaboration between the central bank and the deposit insurer has already been mentioned. Another example is collaboration between the central bank and the bank supervisory authority, if different, and with other financial regulators such as those overseeing the securities markets. In some cases, cooperation between national and local authorities is called for.

### *International cooperation*

A similar principle applies to collaboration between central banks across national boundaries. In a world full of global institutions and markets, it is frequently impossible for a central bank to deal single-handedly with a large systemic problem. Spillovers into other national markets are not uncommon, necessitating international cooperation among central banks.

### *Public communication*

In some cases, a mere statement from the central bank can be a very powerful tool for dealing with a crisis. A statement of fact can help alleviate fears in the marketplace, which could be fueled by incorrect or incomplete information. All crisis management involves an element of public relations in this sense. More challenging are cases in which the central bank suggests a course of action for private-sector institutions to follow, which may have been overlooked or more typically is not pursued spontaneously for lack of confidence in the reactions of other institutions, including the central bank. This type of public exhortation is sometimes known as “jaw-boning” or “moral suasion” by the central bank. Public communication is generally a low-cost strategy. The principal cost may be in terms of credibility if information turns out to be inaccurate or if the central bank is forced to back away from a suggested strategy.

### **III. Credibility and public confidence**

A lack of credibility or a loss in public confidence can easily undermine a central bank's best efforts to lead a financial system through a crisis. This section discusses briefly why credibility and public confidence are important in dealing with crises and how the central bank can achieve them.

#### **A. Credibility and moral suasion**

Credibility is essential to the central bank in all of its functions, but it is particularly necessary when it tries to convince private-sector institutions to do what they would not have done of their accord. "Moral suasion" or "jaw-boning" can be very powerful and cost-effective tools for the central bank, but they have very little likelihood of success if they are not backed by central bank credibility. In most cases, the actions proposed by the central bank to the private sector do not come as a surprise to market participants. The value of central bank suasion is that it provides greater assurance to the private institutions that they will not go individually out on a limb: that the "system" will go along with them. In this sense, they have less to fear from predatory competitors and from adverse future actions by the central bank. It is clear, however, that if the central bank lacks credibility, it will be impossible to get the necessary core of the private sector to go along with a plan. To obtain credibility, in turn, the central bank must have a distinguished track record and must be in a position to make authoritative public announcements in times of stress.

#### **B. Multiple objectives and public confidence**

What happens when the actions dictated by the central bank's role as a systemic crisis manager conflict with other central bank goals? The classic case is probably the onset of a systemic crisis that dictates an infusion of liquidity at a time when the central bank is actively fighting inflation. If liquidity is injected, inflationary expectations and subsequent inflation may rise, affecting not only the macroeconomy, but possibly undermining confidence in the central bank's inflation-fighting resolve. If liquidity is not injected, the crisis may escalate and lead to the failure of both solvent and insolvent institutions. In such instances, it is essential that the central bank's actions be transparent: that the public understands exactly what all the policy goals are and how much weight is being assigned to them on an ongoing basis. A shift away from inflation-fighting that is perceived as temporary and well-reasoned may not undermine confidence in the central bank. The horizons involved in such instances may be helpful. For example, inflation is usually a medium- to long-term goal, whereas the management of a crisis may have a much shorter-term horizon. Thus, the policy may be reversible in time to address longer-term goals.

#### **C. Moral hazard**

Moral hazard, like central bank credibility and public confidence, depends on expectations of how the central bank will act in a crisis. In addition, moral hazard involves expectations of how other individual institutions will act, specifically to take opportunistic advantage of expected central bank actions. For instance, a large institution may think that it is too big to be allowed to fail and that the central bank will come to its rescue regardless of how risky it becomes. Another classic example is deposit insurance.

Banks with the ability to put losses to the insurer may generate cheap insured deposits and invest them in risky ventures, since the insurer bears the ultimate cost of risk. The existence of moral hazard makes it much more difficult and sensitive to apply some of the tools discussed before. This is particularly true of discount window lending, recapitalization, and deposit insurance.

#### **IV. Actual use of tools to deal with past systemic problems**

This section provides a very brief synopsis of each of twenty crisis situations since 1965 that had the potential to lead to systemic problems. The information is drawn mostly from internal and external documents from the U.S. Federal Reserve System.<sup>1</sup> Although the sample includes cases from various countries, there is an emphasis on U.S. cases.

The analysis of this sample of crises (albeit not scientifically selected), indicates that targeted tools have been the most frequently employed by central banks and are probably the most effective. Bank supervision played a role in nearly all the crises, and discount window lending was used in half the cases. Deposit insurance was helpful, generally in dealing with the aftermath of about a third of the crises. In contrast, generalized measures, such as domestic and foreign market operations, were much less frequently employed. Informational tools were used in about one-third of the cases.

The individual titles below indicate the central bank whose perspective is taken in the discussion and the year in which the incident originated. A table summarizing the information in this section is included at the end.

##### *Yamaichi, Japan, 1965*

In 1965, the Bank of Japan helped prevent the collapse of Yamaichi Securities, one of the largest securities firms in the country. Stock market losses beginning in 1961 had weakened the firm substantially. Furthermore, market monitoring indicated that the Japanese banking system had significant exposure to Yamaichi. In consultation with the Ministry of Finance, the Bank of Japan put together in 1965 a rescue plan that included loans equivalent to over \$93 million (in 1965 values). In the end, Yamaichi pulled through the crisis to remain one of the top Japanese firms.

##### *U.K. secondary banks, 1973*

Secondary banks in the U.K. developed outside the traditional banking sector beginning in the late 1950s, without a requirement for an operating license and with very little regulation. In 1973, following concern about the quality of their assets, secondary banks began to face heavy deposit withdrawals, and market monitoring indicated that they were having difficulties in rolling over their short-term funds. The Bank of England led a

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<sup>1</sup> The documents are not classified as confidential, but some may not be readily available. Accessible documents include: Testimony of Chairman Alan Greenspan before the Committee on Banking and Financial Services, U.S. House of Representatives, October 1, 1998 (from [www.federalreserve.gov](http://www.federalreserve.gov)); Statement by William J. McDonough, President, Federal Reserve Bank of New York, before the Committee on Banking and Financial Services, U.S. House of Representatives, October 1, 1998 (from [www.ny.frb.org](http://www.ny.frb.org)); Supervisory Lessons to be Drawn from the Asian Crisis, Basel Committee on Banking Supervision Working Papers No. 2, June 1999 (from [www.bis.org](http://www.bis.org)).

rescue effort that included both moral suasion and direct lending to the institutions. The Bank's initial response was to ask the clearing banks to contribute to a rescue package of loans, with a small central bank participation. Subsequently, some secondary banks received direct credit assistance from the central bank. Finally, the Bank of England arranged for many of the troubled banks to be acquired by healthy institutions.

*Bankhaus Herstatt, Germany, 1974*

Herstatt was a medium-sized commercial bank located in Cologne. It had a sizable foreign exchange portfolio that became much riskier with the advent of the floating exchange rate regime in 1973. In June of 1974, the Bundesaufsichtsamt für das Kreditwesen determined that Herstatt was insolvent, that its licence should be revoked, and a liquidator would be appointed. The Bundesaufsichtsamt made this public at approximately 4:00 p.m. local time on June 26, and the Bundesbank ceased clearing for Herstatt's account. The time of the announcement was the end of the day in Germany, but only mid-morning in New York. Thus, although the DM legs of transactions had gone through, the dollar legs in New York had not. As a result, some counterparties receiving dollars from Herstatt suffered losses, and others paying dollars decided not to honor transactions involving the German bank. Gridlock ensued in the international payments system until a few days later, when New York clearing house banks instituted a special procedure to facilitate international payments. The full tangle took several months to unravel. In the meantime, a consortium of private German banks provided full compensation to Herstatt depositors with accounts under the equivalent of \$7,500 (in 1974 values).

*New York City fiscal crisis, US, 1974*

Starting in the early 1960s, the New York City government experienced a series of budget deficits, which were financed with short-term debt. By 1974, the city's short-term debt had grown to such proportions that it encountered serious problems in issuing new debt instruments. In December of that year, a consortium of commercial and investment banks absorbed a \$50 million loss on the city's debentures, and the city's A rating was withdrawn by Standard & Poor's. In 1975, the city was unable to raise several billion that it needed to roll over its maturing debt. The Federal Reserve collaborated with other official agencies in the design of a plan for the city to put its finances in order. Bank supervisors helped assess the extent to which some banks could assist the city, and they also identified some banks, typically smaller, that were in danger of failure as a result of large exposures to the city government.

*Silver market crisis, US, 1980*

In the mid- to late-1970s, the Hunt brothers amassed a very large position in silver, to a large extent by taking possession of the settlement amounts of futures contracts at the New York Commodity Exchange and at the Chicago Board of Trade. In 1980, higher silver prices attracted unexpected supply to the market, and the futures exchanges implemented new requirements intended to control price manipulation. As a result, the Hunts' financial position deteriorated markedly, with negative implications for both the silver market and for the Hunts' creditors. The Federal Reserve stepped up its examinations of banks' positions with regard to the Hunts to try assess the magnitude of

the problem. A consortium of banks eventually provided a consolidation loan to the Hunts' interests to avoid further market disruptions. Most of the banks in the consortium borrowed from the Federal Reserve's discount window during this period, although the level of their borrowing was not considered unusual.

*Schröder, Munchmeyer, Hengst, Germany, 1983*

Schröder, Munchmeyer, Hengst, a German bank, faced collapse in November 1983. A large share of its lending was to IBH Holdings of Luxembourg, one of Europe's largest construction equipment companies. When the loans to IBH went into default in November, Schröder, Munchmeyer, Hengst was in danger of losing a very large proportion of their assets. Apparently at the urging of the Bundesbank, a consortium of German banks provided Schröder, Munchmeyer, Hengst with stable funding, possibly staving off a breakdown in interbank lending in Germany.

*Continental Illinois, US, 1984*

As part of a strategy since 1973 to make Continental one of the top lenders in the United States, the bank purchased between 1978 and 1982 a large number of oil-related credits from Penn Square Bank, which failed in mid-1982. This portfolio of loans suffered heavy losses, leading Continental to make extraordinary loss provisions by end-1982. These troubles led to difficulties for the bank in obtaining funds in the U.S. market, and it turned increasingly to the European interbank market for funds. In early 1984, the bank's situation became precarious, leading the Federal Reserve to step up its monitoring of the institution. Rumors of and impending failure started circulating worldwide. The dollar fell sharply and the Federal Reserve intervened to stabilize the foreign exchange market. By May, the firm had obtained discount window assistance from the Federal Reserve, in consultation with the Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation (FDIC). Later that year, the FDIC produced an open assistance package that included discount window borrowing as well as equity funds. As of the end of the 1980s, the loans had been repaid and the FDIC had liquidated its investment through a series of sales.

*Johnson Matthey, UK, 1984*

In 1984, Johnson Matthey Bankers was the banking, gold bullion, and commodity trading subsidiary of the Johnson Matthey Group. It had an important position, particularly in the bullion market, since it was one of only a handful of officially recognized gold dealers in London. As a result of diminished trading in the bullion markets, Johnson Matthey turned to other business lines, such as commercial lending and trade finance. Its exposure to a small number of firms grew rapidly, to the extent that it faced a serious concentration problem. In August 1984, the firm's auditors determined that it was insolvent. Shortly afterwards, the Bank of England stepped forward with a rescue operation that included a recapitalization, mostly with Bank of England resources, and the appointment of new directors, management team, and auditors. In April 1986, the Bank sold the bulk of its interest in Johnson Matthey.

*Bank of New York glitch, US, 1985*

As a result of a simple bug in a computer program, Bank of New York found itself on November 21, 1985 unable to deliver securities to its customers. It received during the day a large volume of securities that were to be transferred to other customers, but the computer glitch made those latter transfers impossible. The Federal Reserve kept the payments system operating until late evening, but it became clear that the problem would not be resolved that day. Since Bank of New York could not complete the transactions and did not have the cash to finance the securities, the discount window advanced to Bank of New York \$22.6 billion of overnight funds. The existing supervisory relationship between the Federal Reserve and Bank of New York helped accelerate the loan evaluation process,

*Ohio S&Ls, US, 1985*

About 70 state-chartered banking institutions in the State of Ohio were members of a private deposit insurer in 1985. When it became known that the largest member of the private insurance fund was close to failure, all members began to experience runs on their deposits and general lack of public confidence. The crisis threatened not only the largest member, but the viability of the insurer and all the other members as well. The Federal Reserve intervened in various capacities. As supervisor, it evaluated the financial condition of affected institutions. As discount window lender, it provided funds to solvent institutions. Finally, as manager of the payments system, it provided for the continued flow of payments involving the members of the private insurer. In some cases of bank failure, the Federal Deposit Insurance Corporation assisted institutions that qualified for federal insurance coverage.

*Maryland, North Carolina S&Ls, US, 1985*

In the aftermath of the Ohio crisis of 1985, member banks of private insurers in the states of Maryland and North Carolina underwent a very similar experience. The closure of the Ohio insurer created strong concerns about its counterparts in these states, and a similar crisis ensued. The pattern of this crisis was very similar to that in Ohio, and the steps taken by the central bank were essentially the same.

*Western Canada banks, 1985*

Following an oil-led boom in the economy of western Canada in the early 1980s, the region went through a sharp economic downturn. As a result, a number of regional banking institutions had serious financial difficulties, which became quite clear in 1985. The Bank of Canada, in consultation with the Canadian Deposit Insurance Corporation and the Province of Alberta, initially extended liquidity to the troubled banks. The package assembled by the Bank of Canada included funds from the then “big six” Canadian banks. When a closer examination of the banks showed that two were actually insolvent, loans to these two banks were suspended and the banks were closed.

*Stock market crash, US, 1987*

In October 1987, the U.S. stock market experienced a drop of previously unseen proportions, which spread internationally. The proximate cause of the drop was not clear, but the practice of “portfolio insurance” by large institutional investors is widely blamed

for the magnitude of the drop. The crash caused the failure of a number of small securities firms and precipitated a liquidity crisis among the large securities firms. Some of these firms advanced margin payments to exchanges on behalf of customers, who were unable to come up with liquidity at a moment's notice. The Federal Reserve took several immediate steps to contain the spread of the crisis. It announced that it stood ready to provide liquidity to the banking system and engaged banks in an effort to support liquidity in the securities markets. As part of these measures, the Federal Reserve injected liquidity into the system through open market operations in the aftermath of the crash. The Federal Reserve also contacted other central banks, which together put in motion a worldwide network of market monitoring. Domestically, it worked with the Treasury Department and with other regulators to keep track of the problems. Through its bank supervisory functions, the Federal Reserve kept track of the exposures of commercial banks to the securities industry and of the severity of liquidity and solvency problems in the banking and securities sectors.

*Highly leveraged transactions, US, 1989*

In the 1980s, banks were aggressive participants in the financing of highly leveraged transaction in the United States. Toward the end of the decade, the failure of some of these ventures was a major cause of concern about the health of the banking system. Traditional bank reporting and examination procedures did not allow for the clear identification of the extent to which banks were exposed to these problems. Therefore, the Federal Reserve instituted new reporting guidelines, and conducted an effort to gauge the exact exposure of the institutions under its supervision, particularly the consolidated exposure of bank holding companies.

*New England Banks, US, 1990*

In the late 1980s and early 1990s, the New England economy experienced a pronounced regional downturn. This slowdown anticipated a nationwide recession in 1990-1991. As a result of the regional economic problems, many banks in New England became financially troubled, including the large Bank of New England. By 1990, Federal Reserve supervisors had determined that the crisis was severe and that it would affect a large number of banks, the regional economy, and even the payments system. For instance, public concern about the banks' health led to deposit runs, which necessitated that the central bank step up its cash processing operations. In a number of cases, including that of Bank of New England, the discount window provided funds in an effort to stem the crisis by restoring liquidity. Eventually, the Bank of New England and others were deemed insolvent and were closed down. The FDIC and the OCC effected the closures, and the FDIC assumed responsibility for covered deposits.

*Drexel, US, 1990*

Drexel Burnham Lambert was the acknowledged leader in the junk or high-yield bond market in the 1980s. The market experienced unforeseen problems in 1989 and, by January 1990, unsecured lenders were starting to pull away from Drexel, creating serious funding problems. By February, the problem was so severe that a liquidation of Drexel seemed unavoidable. An orderly liquidation was expected to lead to few losses to counterparties. However, because Drexel had so many counterparties and complex

relationships, an abrupt liquidation could lead to serious systemic losses. The Federal Reserve monitored the exposure of the banking system to Drexel, gathered intelligence through its open market desk, and monitored the payments system for potential bottlenecks throughout the liquidation process. The Federal Reserve also worked closely with the Securities and Exchange Commission, the New York Stock Exchange, the Treasury Department, and with other regulatory agencies. In addition, it made an effort to keep central banks abroad informed about progress in the liquidation of the Drexel positions. The Bank of England intervened as a facilitator and put in place a settlement facility, which remained open for a full week after the onset of the problem.

#### *BCCI, US, 1991*

When the Bank of Credit and Commerce International (BCCI) failed in 1991, it left behind a complex international network of transactions, exposures, and even fraud. To untangle this mess, the Federal Reserve had to work with many official agencies, domestic and foreign. As early as May 1987, the Federal Reserve had made a referral to the U.S. Department of Justice, suspected of money laundering activities in the United States. Since BCCI had several banking operations in the United States, the Federal Reserve was officially responsible for the supervision of some of the affiliates. Beyond the usual supervisory actions and remedies, the Federal Reserve took a very active role in the judicial cases related to BCCI throughout the period leading to its closure.

#### *Southeast Banking Corporation, US, 1991*

Southeast Banking Corporation, based in Miami, was one of the most aggressive real estate lenders in Florida. When Florida real estate prices fell in the late-1980s and early 1990s, Southeast suffered serious losses. The Federal Reserve and the OCC were aware in 1990-1991 that the company was in serious trouble, but under then-current law were unable to close the institution, which still had some equity capital. Through 1991, the condition of the company deteriorated further. The FDIC asked the Federal Reserve to extend to Southeast discount window credit, on the expectation that it would reduce the FDIC's ultimate losses. In September 1991, the discount window loans were called and the OCC closed the bank with the FDIC acting as receiver.

#### *Asian crisis, US, 1997*

The extraordinary economic performance of many East Asian countries in the mid-1990s (e.g., China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand) attracted a large amount of capital from abroad. To a large extent, the capital was denominated in foreign currencies and was short-term. These foreign investments began to unravel in early 1997 with the bankruptcy of several Korean conglomerates, and by the fall of 1997 spillover effects were being felt in Europe and the United States. The large volume of the debt, together with the need to rollover short-term funds, made it difficult for the Asian countries to deal with the crisis. In the United States, the Federal Reserve kept a watchful eye on the exposures of U.S. banks to the Asian countries. To improve conditions in Korea, the Federal Reserve worked with other central banks to convince commercial banks to create a coordinated program to lengthen the maturity of Korea's outstanding obligations. Market conditions were closely monitored, and open market operations were directed at alleviating short-term liquidity

conditions, rather than focusing narrowly on inflation expectations. Other central banks in countries affected by the crisis took steps of their own.

*LTCM, US, 1998*

The hedge fund Long-Term Capital Management had attracted a very large amount of capital from its investors. This capital was levered dramatically through complex financial transactions with many counterparties, to the extent that the gross size of the investments reached a very large multiple of capital. Under these conditions, several positions taken by the hedge fund with regard to credit spreads began to experience severe losses in 1998. The Federal Reserve became aware of these problems and began active monitoring of markets and of supervised banking institutions in order to obtain a clear picture of the severity of the problem. Concerned about potential adverse effects on capital markets of the meltdown of such a large complex portfolio, the Federal Reserve facilitated discussions among major private-sector creditors of LTCM to wind down the portfolio and liquidate the firm. On September 22, a consortium of private-sector firms agreed to recapitalize LTCM in order to facilitate the orderly liquidation of the firm. LTCM was ultimately liquidated without losses to the consortium.

**Summary Table: Use of various tools by central banks to deal with systemic problems, 1965-1998**

Problem, Central Bank	Year	Targeted tools					Generalized tools				Informational tools			
		Sup	Legl	Disc	Rcap	DI	Omo	FX	Pmt	Mkt	Iag	Int'l	PC	
Yamaichi, Japan	1965			✓								✓		
UK secondary banks	1973	✓		✓								✓		✓
Bankhaus Herstatt, Germany	1974	✓				✓								
New York City fiscal crisis, US	1974	✓										✓		
Silver market crisis, US	1980	✓		✓										
Schröder, Munchmeyer, Hengst, Germany	1983													✓
Continental Illinois, US	1984	✓		✓	✓	✓				✓				
Johnson Matthey, UK	1984	✓			✓									
Bank of New York glitch, US	1985	✓		✓								✓		
Ohio S&Ls, US	1985	✓		✓		✓						✓		
Maryland, No. Carolina S&Ls, US	1985	✓		✓		✓						✓		
Western Canada banks	1985	✓		✓		✓						✓		✓
Stock market crash, US	1987	✓							✓			✓		✓
Highly leveraged transactions, US	1989	✓												
New England Banks, US	1990	✓		✓		✓						✓		
Drexel, US	1990	✓										✓		
BCCI, US	1991	✓	✓									✓		✓
Southeast Banking Corporation, US	1991	✓		✓		✓								
Asian crisis, US	1997	✓							✓			✓		✓
LTCM, US	1998	✓										✓		✓

**Key to column headings**

Sup	Bank supervision	FX	Foreign exchange intervention
Legl	Legal action	Pmt	Payments system action
Disc	Discount window lending	Mkt	Market monitoring
Rcap	Recapitalization of institution	Iag	Inter-agency cooperation
DI	Deposit insurance	Int'l	International cooperation
Omo	Open market operations	PC	Public communication