

**THE FOUNDATION
OF THE FEDERAL
RESERVE SYSTEM
IS THE CO-OPERATION AND
THE COMMUNITY OF INTEREST
OF THE NATION'S BANKS
THIS BANK AS A MEMBER,
SHARES IN THE STRENGTH
AND THE PROTECTION WHICH
FEDERAL SUPERVISION
AFFORDS**



The 1913 Federal Reserve Act requires all nationally chartered banks to become members of the Federal Reserve System. State-chartered banks have the option of becoming members. The Depository Institutions Deregulation and Monetary Control Act of 1980 opened up the benefits of Federal Reserve membership to a broader range of financial institutions.

Central Banks & Crisis Management

by Joseph Haubrich, James Thomson, and O. Emre Ergungor

As 2007 began, historians prepared to reflect on several anniversaries of financial turmoil. It had been 10 years since the East Asian crisis, 20 years since the Black Monday stock market crash, 100 years since the Panic of 1907, and 150 years since the Hamburg financial crisis of 1857. Not many, however, could have predicted that 2007 would write its own chapter in history with the subprime mortgage meltdown.

The historical perspective may reveal the deeper issues behind recent events. The fundamental causes and full consequences of previous crises did not become apparent until after they had passed. Reflecting on historical analogies may serve us better than adopting too narrow a focus on day-to-day market changes and results.

Certainly, there are some critical differences in today's events from those in previous episodes. For example, since the savings and loan crisis and bank problems of the 1980s, regulation has emphasized solvency issues, such as ensuring adequate capital and proper measures of bank risk. But it was liquidity problems that first garnered widespread attention in the current crisis—a seizing up of markets for securitized credit and asset-backed commercial paper, which placed considerable balance sheet and liquidity pressures on many large U.S. and European banks and securities firms.

The financial market events of 2007 (which have continued into 2008) provide yet another opportunity to consider financial crisis management, and in particular the problems confronting central banks. In this essay, we identify two long-standing issues that central banks must confront during periods of financial market stress. The first is moral hazard, a situation in which people do not take adequate care because they do not fully bear the costs of their decisions. The second is dynamic inconsistency, an environment in which policymakers take actions that make short-term sense, but that do not necessarily lead to the best long-term outcome.

We begin by asking why a central bank's mission includes responsibility for financial stability. Next we consider the central bank's response to crisis and its intended and unintended consequences. Because many issues faced by the central bank depend on the broader crisis-management environment, we conclude by addressing how a central bank fits into the broader context of advance planning and the design of institutions that should be in place before the turmoil begins.

WHY WE CARE: THE BASICS OF A HEALTHY FINANCIAL SYSTEM

The Federal Reserve System was created in 1913, after a long series of banking panics from 1857 to 1907. The initial motivation was to stem financial crises originating from shortages of money in the banking system. Thus, the preamble to the Federal Reserve Act announced the intention “to furnish an elastic currency, to afford means of rediscounting commercial paper, [and] to establish a more effective supervision of banking in the United States.” Over time, it has become evident that healthy economies require healthy financial systems, and central banks such as the Federal Reserve can operate on a number of fronts to foster financial stability.

The Federal Reserve Act has been amended at various times to provide the System with the means for accomplishing this objective. For example, the Banking Act of 1935 amended the Federal Reserve Act “to provide for the sound, effective, and uninterrupted operation of the banking system” and afforded the System greater regulatory and supervisory authority over banking organizations. Also, the Federal Reserve has long had a strong operating presence in the nation’s wholesale and retail payments systems, which it has used to promote reliability in clearing and settling of financial obligations.

Although many people identify price stability as the most important objective of a central bank, economists know that price stability, financial stability, and sustainable economic growth go hand in hand. Congress amended the Federal Reserve Act in 1977, instructing the System to control the long-run growth of money and credit “to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”¹

Why is financial stability so integral to the healthy functioning of the economy? The role of the financial system is to allocate capital—to move funds to their best possible uses. A company, hoping to expand and build a new factory, raises the money by selling stocks or bonds to investors or by securing a bank loan. In either case, many individuals pool their savings to make the investment possible. Of course, allocating funds is part of the process. If people cannot see a profit in the firm’s expansion, they will not buy the company’s securities and the factory will not get built. If the bank thinks the project is too risky, it will not lend the money—it will decide to invest elsewhere.

The financial system, then, matches savings and investment, fostering economic growth. Indeed, international studies have shown that a major difference between developed and less-developed countries is the ability to pool investment capital.

An impressive amount of money flows through the financial system. In 2007, net borrowing by U.S. household and business sectors totaled \$1.9 trillion, or 14 percent of GDP.² Outstanding debt for the same sectors totaled \$23.9 trillion. It makes sense, then, that problems in the financial markets will cause problems in the labor, capital, and product markets. A serious disruption in the flow of funds through financial institutions can shrink investment, delaying the start-up and expansion of businesses or pushing them into bankruptcy. It can depress consumption if household access to credit markets becomes curtailed. Weaknesses in economic activity can then further impair the condition of financial institutions, once again decreasing income and spending. The entire process can be amplified by uncertainty and caution.

To fully understand the roles a central bank can play in mitigating the worst effects of financial crises, we must take a closer look at the various ways in which banking panics and market crashes can disrupt the real economy, leading to higher unemployment and loss of income. Let’s begin with the period prior to the founding of the Federal Reserve System in 1913. A major concern at the time was that the money supply was inelastic—that is, it could not expand and contract along with the needs of trade. When a crisis threatened, each bank would hoard its funds, reduce loans, and refuse to convert deposits into currency. The result was predictable: reduced lending, a smaller money supply, and financial stringency.

Without a central bank to increase the quantity of money that anyone would accept as payment for an obligation, each individual’s attempt to protect himself made the problem worse. Banks could be solvent but not liquid enough to meet their current obligations without having to sell valuable assets at a steep discount to raise cash. J.P. Morgan mobilized private funds to end the banking panic of 1907, but the federal government decided that going forward, the nation should rely on a central bank.

1. Section 2a of the Federal Reserve Act: 12 USC 225a as added by act of November 16, 1977 (91 Stat. 1387).

2. Data from the Flow of Funds, table F.1, for the nonfinancial, nongovernment sector.

Why place this responsibility with the central bank? Part of the reason stemmed from dissatisfaction with how crises had been resolved in the past, but perhaps a greater reason was that financial innovations were already pointing to the benefits of a centralized response. In the nineteenth century, groups of banks formed clearing house associations, which in the panics of 1873, 1893, and 1907 issued “clearing house loan certificates” in exchange for deposits of legal currency.

This early form of elastic currency helped mitigate the effects of the panic. The Federal Reserve Act essentially cast the Federal Reserve System into the role of the nation’s most powerful clearing house. The Act provided another means for making the nation’s money supply more elastic: “rediscounting,” the process by which banks pledge collateral and borrow from the Federal Reserve (see box on page 10).

Clearing House Loan Certificates



The clearing house originated as a single location to provide clearing and settlement services for its member banks. Thus, a single bank did not have to deal with all other banks, but only with the clearing house. Clearing houses originally arose to settle and clear banknotes, but as checks became more important in the U.S. economy, clearing house volumes increasingly shifted to checks and the clearing house associations expanded.

In times of panic, however, the clearing house took on additional roles beyond clearing checks. Starting in 1857, the clearing house, on approval of its policy committee, would issue clearing house loan certificates, a currency substitute that was the liability of the clearing house association, not of any specific bank. Banks could use the certificates in clearing checks with other banks, freeing up currency to pay depositors. Later, after 1873, the certificates were issued directly to depositors. These certificates were thus an early form of elastic currency and — because the certificates represented a claim on the entire group of banks — an early form of the lender of last resort. Clearing houses also pioneered a variety of other central bank activities, such as capital requirements, reserve requirements, interest rate caps, and regular audits and reports.

Sources: Gorton (1985); Gorton and Huang (2006).

Central banks provide nations with some tools for dealing with financial crises, but having a central bank does not immunize nations from experiencing severe financial disturbances and poor economic performance. Consider the evidence from several historical episodes. The most famous, of course, is the Great Depression. Although bank failures featured prominently in the Depression, at first they appeared to have little direct impact on the economy. The failures seemed either to reflect the deteriorating economy or to have resulted in a drastic decrease in the money supply, which in fact did the damage.³ More recent work, however, suggests that the banking crisis did have real effects above and beyond monetary policy. With nearly one-third of U.S. banks

failing, financial services dried up and credit became much more difficult to obtain.⁴

In a well-functioning system, other means of financing could have offset at least part of reduced lending and bank services. However, pronounced deflation (prices fell by 25 percent from 1929 to 1937) substantially reduced the wealth of debtors, as the real value of principal and interest rose as prices fell. With less wealth and less collateral to stand behind borrowings, funding became difficult. In addition, consumers cut back on purchases in the hope of retaining some liquidity.⁵ The commercial paper market also dried up. With both businesses and consumers hurting, and alternative funding unavailable, the stage was set for a serious depression.



The Discount Window

Discount window lending is used when depository institutions borrow directly from their local Federal Reserve Bank. They may borrow under several programs (including primary credit, seasonal credit, and most recently, the Term Auction Facility), provided they have the appropriate collateral and meet several other requirements. This lending expands the bank's reserves, increasing its liquidity. A discount window loan also expands the reserves of the banking system, increasing overall liquidity. When a loan is paid off, reserves and liquidity decrease. Today, the overall change is usually offset by open market operations, leaving the stance of monetary policy unchanged.

This practice was known as rediscounting. The original discount was when the merchant sold the paper to the bank. Interest was paid because the bank advanced less money than the merchant would eventually pay back, and the Federal Reserve advanced less than what the bank paid. Today the process for extending credit to depository institutions is known as discount window lending. See the Operational Highlights section of this report on page 22 for more information on this function.

3. Temin (1976); Friedman and Schwartz (1963).

4. Bernanke (1983).

5. Mishkin (1978).

Financial disruptions affected the overall economy in later episodes as well. Before 1981, Federal Reserve Regulation Q put a cap on the interest rate that banks and thrifts could pay on deposits. Rising interest rates would often lead to disintermediation, where depositors withdrew money from the regulated institutions and moved it into higher-yielding financial instruments from unregulated institutions. In response, the regulated institutions, particularly savings and loans (S&Ls), cut back lending, in turn reducing house construction, which depended heavily on mortgages from S&Ls. Even moderately restrictive monetary policy could have large effects. For example, in 1966, residential construction fell by 23 percent in just one year.⁶

A further lesson on the lingering effects of financial problems comes from Japan. In the 1970s and 1980s, Japan experienced a real estate and stock market boom. The real estate bubble reached a point at which the land beneath the emperor’s palace in Tokyo had a market value equal to all of the real estate in California.⁷ The stock market peaked in 1989 and real estate prices peaked in 1990, after which both lost more than half their value. Loans collateralized by land (or stock) did not seem as safe as they once did. The severity of the collapse proved the truth of the old adage, “If you owe the bank \$100 and can’t pay, that’s your problem. If you owe \$100 million, that’s the bank’s problem.”

Faced with numerous problem loans, Japanese banks resorted to “evergreening,” extending new loans to troubled borrowers so these firms could continue to make interest payments, enabling the banks to avoid reporting losses.

But by propping up problem loans, the banks had less capital to fund growing, profitable firms. This became a classic illustration of opportunity cost. The problem was not that lending decreased—in fact, bank loans increased until the mid-1990s—but that capital was misallocated as loans went to the wrong firms.⁸ Failure to resolve the financial problems led to years of disappointing growth.

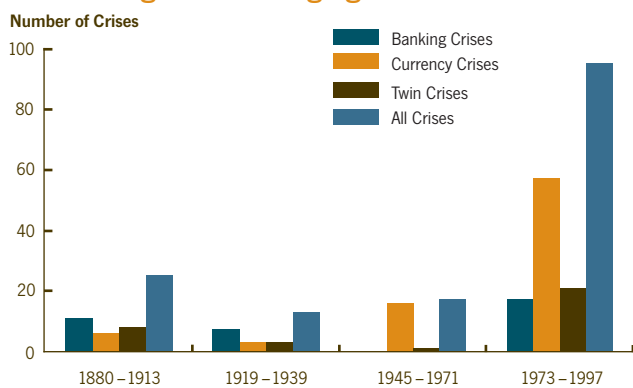
CRISIS AND RESPONSE

A financial crisis provides perhaps the most concrete opportunity for a central bank to assert its role in achieving financial stability. But what role should the central bank play in a crisis? Much depends on the cause of the crisis, the market failure behind it, and the costs and benefits of resolving the market failure.

The historical record provides many examples of crises and panics of different sorts in various countries (see figures 1 and 2). For example, the past century has seen classic banking panics, when people run on banks, as well as broader crises when funding markets collapse. We have also seen currency crises, when people rush to get out of a nation’s money, and twin crises, consisting of a simultaneous run on a country’s banks and currency.

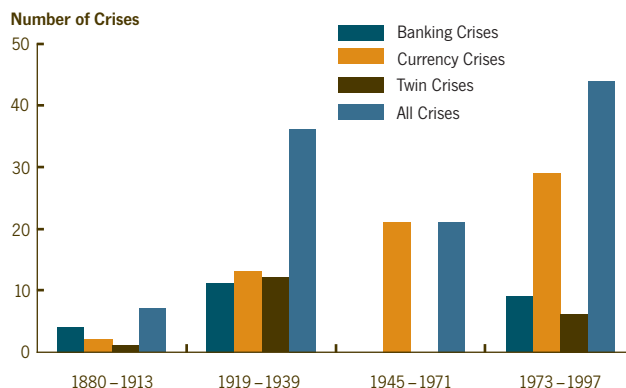
Sometimes a small shock will be responsible for the crisis, as a seemingly insignificant incident—a fraud, scandal, or rumor—sets off a panic. At other times, a large shock, such as a war or an abrupt change in government policy, will set off a crisis.

Figure 1: Emerging Markets



Source: Bordo and Eichengreen (2002).

Figure 2: Industrial Countries



Source: Bordo and Eichengreen (2002).

6. Bernanke (2007).

7. Allen (2001).

8. Peek and Rosengren (2005).

Still, most crises do share a resemblance. Uncertain about economic conditions, people rush to convert their illiquid assets to cash, sometimes in dramatic fashion. When depositors rush to convert bank deposits into cash, we have the classic bank run dramatized in the movie *It's a Wonderful Life*. When investors rush to exchange the Thai baht for dollars, we have a currency run. When institutional investors refuse to roll over asset-backed commercial paper, we have the financial turmoil of 2007–08 (see box on page 13). In many cases, this desire to convert assets takes the form of a demand for liquidity.

A liquidity crisis can cause otherwise solvent firms to fail, disrupting the financial system, reducing investment, and slowing economic growth. Banks must reduce lending or even call in loans. Businesses that rely on short-term funding, such as commercial paper, find it impossible to keep issuing that paper and must restrict investment and let profitable projects languish. Furthermore, most commercial paper is backed by bank lines of credit, meaning that disruptions in the commercial paper market can place increasing liquidity pressures on commercial banks.

Central banks are assigned different roles, responsibilities, and policy tools in their home countries. Their ability to promote and maintain a healthy financial system depends on their specific policy tools and their capability to perform during periods of stress. Nevertheless, by definition, central banks control the supply of base money in their countries, and thus can supply their financial systems with a highly liquid financial asset during times when markets hunger for it.

This, then, is where the central bank plays its most powerful role. As the monetary authority, it can create fiat money—the essence of liquidity.⁹ By creating liquidity, the central bank can forestall liquidation or fire sales of productive assets, preserving the “going concern value” of firms.

A good example is the Penn Central Crisis of 1970. The railroad went bankrupt, defaulting on its commercial paper. With credit markets already tight, investors became reluctant to invest in commercial paper, jeopardizing the funding of many corporations. The Federal Reserve stepped in, providing liquidity. As one observer put it:

What the Fed did was to provide assurance to the financial markets that the liquidity essential to their operation would be preserved. If panicky investors refused to renew their holdings of commercial paper, preferring Treasury bills . . . instead, their extreme preference for safety would not be allowed to contribute to widespread insolvency. Once everyone understood that, there was little reason for panic.¹⁰

Liquidity problems, though, are not the only reason a firm may have trouble borrowing, and this makes the central bank's decision more difficult. The classic distinction is between liquidity and solvency: A firm is insolvent if the total value of its liabilities exceeds the total value of its assets—in other words, if it owes more than it is worth. A firm is illiquid if it cannot pay on its liabilities due right now. The classic notion of a solvent but illiquid firm is a company with valuable assets and good prospects of future sales, but whose cash flows lie in the future, so it must borrow money to keep going.

The distinction between liquidity and solvency problems means that central bank actions—or inaction—appropriate in one situation may be exactly the wrong prescription in another. Furthermore, actions taken during a crisis have consequences long after the crisis is resolved.

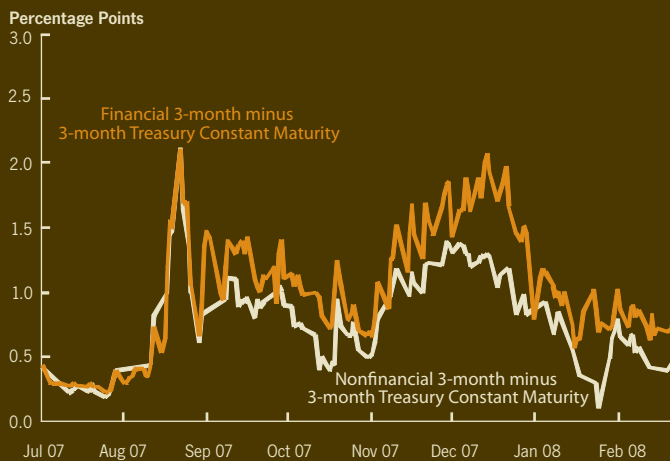
9. Theoretically, at least, it is conceivable that private agents might create money (as was done in the U.S. Free Banking Era from 1838 to 1863), but today it is generally the function, and indeed the defining feature, of the central bank.

10. Melton (1985, 158).

The Current Financial Distress in a Nutshell

Weak underwriting standards for subprime mortgages, combined with falling home prices, led to soaring delinquencies in 2007. Most of these mortgages were bundled together and sold into mortgage-backed securities, then repackaged into collateralized debt obligations. When it became clear that these securities could suffer heavy losses, despite their high ratings (AAA and AA), investors lost faith in the ratings system for complex structured securities and pulled back in a wide range of markets. The outstanding value of asset-backed commercial paper declined by one-third, or about \$350 billion, between August and December 2007. For banks, which provided back-up liquidity facilities for the vast majority of asset-backed commercial paper outstanding, difficulties in rolling over commercial paper resulted in significant balance sheet and liquidity pressures. As a result, banks became reluctant to lend to others, particularly in the term funding markets.

Commercial Paper Spread



Source: Federal Reserve Board.

(commercial paper) and a safe security (the Treasury bill) and therefore indicates the financial market's assessment of risk in the economy. The figure shows the course of this yield spread since the subprime meltdown began in summer 2007.

The liquidity problems did not abate as quickly as many in the market had hoped, and the Federal Reserve took a number of steps, beyond reductions in its federal funds rate target, to ease strains in financial markets. The changes during this period of market disruption fall into four broad categories: (1) longer terms of lending, (2) broader types of collateral, (3) a wider class of counterparties, and (4) a tighter spread between the primary credit rate and the target federal funds rate. These initiatives were designed to bolster market liquidity and promote orderly market functioning.

Monoline bond insurers were hit particularly hard, leading to questions about their ability to stand behind municipal bonds. Hedge funds, despite suffering notable losses in August by funds using quantitative trading strategies (quant funds), have mostly survived.

These events were reflected in the rates paid in the commercial paper market, particularly the spread between 90-day commercial paper and three-month Treasury bills. This spread measures the difference between interest rates on a risky security

Crisis Response: Intended and Unintended Consequences

While central banking may properly be considered more art than science, the central bank has some time-honored advice for confronting a liquidity crisis. First suggested by Sir Francis Baring in 1797 and Henry Thornton in 1802, the advice is best known in the formulation of Walter Bagehot (founder and first editor of *The Economist* magazine), in his book *Lombard Street*:

The end is to stay the panic; and the advances should, if possible, stay the panic. And for this purpose there are two rules:—First. That these loans should only be made at a very high rate of interest. This will operate as a heavy fine on unreasonable timidity, and will prevent the greatest number of applications by persons who do not require it. . . .

Secondly. That at this rate these advances should be made on all good banking securities, and as largely as the public asks for them. The reason is plain. The object is to stay alarm, and nothing therefore should be done to cause alarm.¹¹

Bagehot's rules can be summarized as "lend freely at a penalty rate." The central bank must provide enough liquidity to meet the needs of the market, but it must also prevent banks from profiting at the central bank's expense. The penalty rate should allow those firms that need liquidity to survive, but it should discourage those looking only for cheap funding.

The rules distill some hard-won wisdom gleaned by the Bank of England. It is not sufficient merely to resolve the financial crisis. The central bank must ensure that its actions do not set the stage for future crises. Bagehot saw how the wrong lending policy could make financial problems worse. In modern jargon, this problem is known as moral hazard. The term is borrowed from insurance, when people tend to take on more risk simply because they are insured. For example, people build houses near the beach, knowing that insurance will reimburse them for some of their losses after a hurricane hits. The term has taken on a broader meaning of how behavior changes when people do not bear the full costs of their actions.

Indeed, moral hazard lay behind one of the more severe recent financial crises: the S&L crisis of the 1980s. When the inflation of the late 1970s rendered many S&Ls economically insolvent by pushing deposit rates above the rates on fixed-rate mortgages, S&Ls responded by taking on increasingly risky investments. If the investments paid off, the S&L returned to health; if they did not, the Federal Savings and Loan Insurance Corporation, which insured their deposits, paid the depositors.

Moral hazard meant that insolvent S&Ls gambled for resurrection because federal deposit insurance insulated new depositors from the risky investments. Many of the gambles famously did not pay off, impoverishing the insurance fund and the taxpayers who stood behind it.¹² The \$152 billion direct cost to taxpayers, large as it was, did not measure the full impact on the economy. Those loans went to buildings that remained empty and shopping malls that never saw customers. The total indirect economic costs of the crisis are estimated at \$500 billion.¹³

Guarantees can take other forms besides explicit deposit insurance, and they sometimes do. For example, Continental Illinois was labeled "too big to fail" and was rescued in 1984. Expectations of rescue have the same effect as insurance. As economic historian Charles Kindleberger puts it: "...if the market knows it is to be supported by a lender of last resort, it will feel less (little? no?) responsibility for the effective functioning of money and capital markets during the next boom. The public good of the lender of last resort weakens the private responsibility of 'sound' banking."¹⁴

Of course, crises do not always sort themselves into the "liquidity" type of the classic bank run and the "solvency" type of the S&L crisis. Solvency issues often lay behind the demand for liquidity in the 1800s, and many modern financial crises display attributes of both, particularly the international "twin crises" that combine a banking panic with a run on a nation's currency. The classic example is the East Asian crisis of the past decade.

11. Bagehot (1874, 197).

12. Kane (1989).

13. Stern and Feldman (2004).

14. Kindleberger (2000, 161).

Anatomy of the East Asian Crisis



In the early 1990s, the East Asian “tigers” (Indonesia, Malaysia, Philippines, Thailand) and “dragons” (Hong Kong, Singapore, South Korea, Taiwan) experienced strong economic growth with extensive foreign investment, much of it short-term and denominated in dollars. Thus, these economies were vulnerable if foreigners wanted to withdraw their funds.

At the same time, the banking and financial systems in these nations expanded, fueled by both foreign money and deregulation.

In early 1997, exports slowed and bankruptcies increased sharply. Foreign lenders began withdrawing their capital, increasing pressure on exchange rates. The region’s central banks started to defend their currencies, but the drain proved too much. In July, Thailand stopped supporting the baht, and the Philippines and Malaysia soon ceased their defense of the peso and ringgit, with Indonesia supporting the rupee until August.

The International Monetary Fund added \$100 billion of emergency funds but failed to stem the crisis. The plunging exchange rates and capital withdrawal worsened the domestic financial problems as more firms went bankrupt, further weakening the banking system. Moody’s downgraded the debt of Indonesia, Korea, and Thailand to junk-bond status. In early 1998, the Thai government explicitly guaranteed all bank liabilities, including those to foreign creditors.

Sources: Radalet, Sachs, Cooper, and Bosworth (1998); Tirole (2002); Allen and Gale (2007).

The exact causes of the East Asian crisis may never be untangled, but its progression illustrates the extreme pressure for active government intervention beyond liquidity assistance. Even a government that is aware of moral hazard problems can have trouble following through on its promises. This constitutes the second key dilemma in resolving financial crises—dynamic inconsistency.

Recall the beach example. Residents build houses near the beach but cannot get insurance because the chance of hurricanes is too great. The government promises no flood relief, but once a hurricane comes and the damage is done, the government relents and picks up the tab for damages. Homeowners, expecting the government to provide relief, feel confident building near the beach in the first place.

In the analogous case of a financial crisis, even though no explicit insurance exists, a central bank could step in to alleviate liquidity strains on some financial firms or their creditors. The firms and creditors, recognizing this possibility, could take less-than-adequate care of their risk and their liquidity once they believe they will have access to government support. Two episodes illustrate this situation:

- In 1925, more than 500 banks had been borrowing from the Federal Reserve for more than a year, including 80 percent of the more than 200 failing banks.
- In 1974, Franklin National Bank borrowed extensively from the discount window for five months before the bank was closed, with the loans at one point totaling half of its assets. This allowed the uninsured depositors time to exit the bank before it was finally declared insolvent.¹⁵

In the beach example, if the government kept its promise, then over time fewer people would likely build homes on the beach. In the financial crisis example, if the central bank did not alleviate the liquidity strains on some financial firms or their creditors, financial institutions would likely engage in less risky investment practices. Yet we should not forget that Bagehot suggested that lending in a crisis be done on all good banking collateral, as freely as the public wants. How do we reconcile Bagehot's advice with our concern about dynamic inconsistency?

The solution is to recognize that central-bank lending entails both costs and benefits. The benefits come in the form of stemming the panic, which means preventing negative externalities that private decision-makers have no incentive to take into account. The costs come in the form of introducing moral hazards—incentives for people to anticipate that the central bank will act in the same ways in the future and, accordingly, to take on excessive risk. The existence of these costs does not necessarily mean that a central bank should avoid intervening in private credit markets, but rather that it is important for the central bank to look for the lowest-cost (least-distorting) interventions.

PLANNING AHEAD TO CONFRONT CRISES

Financial crisis management ultimately has two goals: minimizing the depth and duration of the current episode and minimizing the probability of future crises. These goals can sometimes conflict because of the time-inconsistency problem facing policymakers. That is, actions taken to manage a crisis in the short run can lead to market incentives that are inconsistent with financial stability in the long run. Preparation can reduce the conflict between the goals, enhance the credibility of the central bank, and lead to shorter, fewer, and less-severe crises.

The essential problem is how to enhance the central bank's credibility. The central bank should provide market participants with incentives to internalize their cost of risk, even if the central bank faces strong pressures to do otherwise. Credibility involves more than just the central bank, however; it depends on the broader environment needed to prevent moral hazard and dynamic inconsistency. This is particularly true in the United States, where the Federal Reserve is only one of several financial-institution regulators.

This is where planning ahead really matters. When a crisis breaks out, events move quickly. Facing up to financial losses and resolving institutions expeditiously can lower uncertainty and reduce the pressure for more drastic action. Although it seems paradoxical, closing financial institutions quickly

15. Schwartz (1992).

limits creditor losses. Preventing small losses from growing into large losses makes it less likely that the credit problems will spill over into other financial firms or to the broader economy, and it reduces the pressure for using public funds to redress creditors' losses.

“Planning ahead can allow the crisis managers to assemble such vital information as the distressed institution’s loans, deposits, and derivatives exposure. A clear view of the size of the problem can reduce the chance of regulatory panic in the face of uncertainty, and real-time knowledge of the situation can enable more nimble responses.”

Evidence shows that waiting increases losses. Researchers note that during the S&L crisis, the average time from insolvency to closure was a lengthy 38 months: 345 thrifts recovered, making profits of \$1.5 billion, but 1,600 failed, losing \$60 billion.¹⁶ Consequently, being prepared to resolve troubled financial institutions expeditiously saves money in the long run.

The planning process might be long and tedious, and its benefits could seem doubtful when markets are calm; nevertheless, the effort could have great benefits in times of distress. For example, advance planning can reduce pressures for inappropriate guarantees. Uncertainty about the extent of a crisis, and the chance that it will devolve into a major economic catastrophe as in the 1930s, may induce regulators to err on the side of safety. Planning ahead can allow the crisis managers to assemble such vital information as the distressed institution’s loans, deposits, and derivatives exposure. A clear view of the size of the problem can reduce the chance of regulatory panic in the face of uncertainty, and real-time knowledge of the situation can enable more nimble responses.

Even knowing who to call or where to find information—a nontrivial exercise in itself—is not enough. In the United States, a crisis involving several large financial institutions could easily involve the Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation, the Federal Reserve, the Securities and Exchange Commission, the Commodity Futures Trading Commission, and state bank and insurance regulators. With multiple actors, planning ahead to define roles and responsibilities adds clarity to the process and makes coordination between the actors (and the public) more likely. International regulators took a step in this direction in 1974 with the formation of the Basel Committee on Banking Supervision, created to encourage cooperation in the supervision of banks operating across national borders.

Planning is also important because actions taken today constrain the range of choices later on. Crisis resolution has three distinct stages: containment, restructuring, and recovery. These stages are interdependent, as early decisions made in the containment phase restrict the possible options in future stages, and the options available at future stages help determine the most appropriate response early on.

Early in the containment phase of a crisis, the heightened uncertainty and the pressure to do something as conditions rapidly deteriorate combine to increase the likelihood of clumsy (time-inconsistent) actions to bring the situation under control. The immediacy of the situation can produce pressures to stop the crisis at any cost. However, well-conceived contingency plans increase the likelihood that crisis managers can respond quickly and forcefully to emerging problems without setting the stage for future crises.

A case can be made that such advance planning is particularly important now. Through its Primary Dealer Credit Facility, the Federal Reserve is providing emergency liquidity assistance to some of the primary securities dealers that serve as its counterparties in open market operations. In addition, the Federal Reserve facilitated the resolution of a large securities firm that served as a primary dealer. For bank failures, experience and institutional memory may substitute for the lack of a publicly articulated plan (although we have argued that this has its downside as well), but for nonbank failures, more basic requirements such as fact-finding mechanisms and resolution procedures need to be developed.

16. Santomero and Hoffman (1999); DeGennaro and Thomson (1996).

Planning also includes practice. A crisis management team cannot just exist on paper. Preparedness for a financial crisis involves conducting crisis simulations where different scenarios are rehearsed and responses are mapped out. Understanding what decisions must be made, what information is required, and who needs to be informed—whether it be talking to the Secretary of the Treasury or writing a press release for the public—takes practice.

This approach to planning has been adopted in several areas. The Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) took a broad-based approach to changing the regulatory environment, reforming the bank regulatory system with the aim of minimizing taxpayer losses. It issued new guidelines for bank examinations, capital requirements, and deposit insurance. Of key importance, it mandated a set of prompt corrective action guidelines intended to assist bank supervisors in handling troubled depository institutions as they slide toward insolvency. Prompt corrective action provides for a wide degree of discretion to ensure that short-term regulatory actions are consistent with long-run incentives for regulated banks and thrifts.

FDICIA's systemic risk exemption allows for public funds to be paid to unsecured creditors of large or systemically important insured depository institutions, but it does so in a politically accountable manner. Invoking the exemption requires votes by the Board of Governors of the Federal Reserve System, the Board of the Federal Deposit Insurance Corporation, and the Secretary of the Treasury. The idea is that these public rescues should be viewed as an extraordinary response and not the default response to the economic failure of a large institution. Hence, the spirit of this legislative remedy for too-big-to-fail policies is that such policies should be used as a last resort.

What Sort of Plan?

A formal plan can keep a broader range of options on the table—be they emergency loans, private restructurings, or haircuts—lowering the odds of simply relying on a familiar but perhaps flawed response used in the last crisis. Addressing some questions beforehand, such as when to impose creditor timeouts, can lead to a more careful assessment of the costs and benefits. For other cases, such as expediting depositor payoffs, a plan can assess—and perhaps remedy—feasibility

concerns. Making the plan public in advance should also enhance its credibility, increasing the likelihood that principles such as prompt loss recognition or central bank support for illiquid, but not insolvent, firms will be followed. Private-market participants would know what principles will drive the decisions of government entities during a time of crisis.

Agreeing to a public plan builds consensus among all parties to follow through on their obligations when it is time to put the plan to use. Publishing a plan in advance could help government entities resist undue influence from various interest groups in a time of crisis. Potential vehicles for developing such a plan might be the President's Working Group on Financial Markets, the Financial Stability Forum, the Basel Committee on Banking Supervision, or another similar group.

Beyond the general suggestions of contingency planning, publicizing plans, and designating a crisis team, what more specific features could a financial crisis plan include, when a primary consideration is to avoid moral hazard and dynamic inconsistency? Another key step is to determine what additional authority and powers might be needed in an emergency—in other words, a crisis management infrastructure.

As discussed above, experience from Japan, the S&L crisis, and other banking episodes illustrates that delaying failure usually increases costs both to the government and to the overall economy. Because a critical element of the restructuring stage of a crisis is to recognize the losses as quickly as possible so that private investment can return and credit flows can be restored, a potentially useful component of the crisis management infrastructure might be a publicly chartered asset disposition company modeled after the Reconstruction Finance Corporation (chartered in 1932) or the Resolution Trust Corporation (chartered in 1989). For the purposes of this essay, let's call the proposed entity the Resolution Management Corporation (RMC). The RMC would be an independent federal corporation chartered by Congress and charged with asset recovery and disposition. It would remain dormant until activated as part of the response to a financial crisis and stay active only as long as needed. It is critically important that the RMC be separate from the Federal Reserve to ensure that the central bank's role as liquidity provider of last resort is insulated from the solvency and asset disposition activities of the RMC.

The RMC would be most useful in what we have termed the restructuring and recovery phases of the crisis. First, by helping to segregate bad assets from good ones, it would speed the return of productive assets to their best use in the private sector. Second, with asset salvage and disposal fully audited, the RMC would increase the transparency of embedded losses. This, in turn, would improve price discovery—that is, the revelation of the true value of the assets—increasing the speed at which distressed assets are returned to the private sector and the ability of financial firms to recapitalize. Finally, by explicitly committing public funds to resolve the crisis, the RMC would improve the accountability of crisis managers and subject the resolution process to congressional oversight.

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The creation of a standby RMC is not without its drawbacks, however, so institutional design issues would need to be carefully studied. For instance, routine activation of the RMC charter during even mild periods of financial distress could socialize losses, increase moral hazard, and reduce market discipline. Moreover, some might be tempted to use an RMC-like entity to delay loss recognition and thereby reduce transparency. In other words, the RMC could have unintended consequences if it is poorly designed, including increasing the likelihood or severity of a financial crisis. This brief example illustrates how difficult it can be to both plan ahead and avoid distorting the incentives of private-market participants and policymakers. Nevertheless, the potential difficulties should not deter an examination of the pros and cons.

Another element to consider in building a better crisis management infrastructure is publishing timely and objective information about financial rescues that involve public funds or guarantees. In the United States, a number of federal (and sometimes state) agencies may be involved in the chartering, regulating, supervising, and insuring of financial institutions. With multiple entities potentially involved in resolving financial institution problems, a good crisis prevention environment requires a consistent alignment of policies and practices among all parties, both to minimize moral hazard among the private-sector participants and to achieve dynamic consistency among the policymakers. Discussions of regulatory reform in the financial services industry could be expanded to include provisions for a government agency that would conduct forensic analysis of financial market failures, increasing the information available to the public about the underlying causes of these failures. More information about the causes of failures, and more ex post analysis of policy choices, could lead to more effective market discipline on the private-sector participants and to improved policy choices by public-sector officials.¹⁷ These benefits should be relevant regardless of the design of the broader regulatory structure.

The Silberzug and Beyond

The Panic of 1857 began with the New York office of an Ohio bank and, after sweeping through Europe, ended when a loan of silver came to Hamburg via a special train—the Silberzug—from Vienna. Of course, we are unlikely to see those exact circumstances occur again. But financial crises and the need to manage them are likely to be with us for some time. How we deal with these crises depends on our choices. The ubiquity of crises and their impact on the economy demand some action, but too great a concern over losses only encourages greater risk-taking. Once the risks are taken and the losses occur, the political pressures for action increase exponentially.

Planning ahead can provide credibility to the promise of limited intervention. With a broad menu of options, current information, and a public plan in place, the central bank is positioned to contain the current financial crisis without contributing to a new one in the future.

17. See Getmansky, Lo, and Mei (2004) and Kane (2001) for some suggestions along these lines.

References

- Allen, Franklin.** 2001. "Do Financial Institutions Matter?" *Journal of Finance* 56(4): 1165–75.
- Allen, Franklin, and Douglas Gale.** 2007. *Understanding Financial Crises*. Oxford: Oxford University Press.
- Bagehot, Walter.** 1874. *Lombard Street: A Description of the Money Market*. Reprint, London: Scribner, Armstrong & Company, 2006.
- Bernanke, Ben S.** 1983. "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *American Economic Review* 73(3): 257–76.
- Bernanke, Ben S.** 2007. "Housing, Housing Finance, and Monetary Policy." Speech, Federal Reserve Bank of Kansas City's Economic Symposium, Jackson Hole, WY (August 31).
- Bordo, Michael, and Barry Eichengreen.** 2002. "Crises Now and Then: What Lessons from the Last Era of Financial Globalization?" Working Paper No. 8716. National Bureau of Economic Research (January).
- DeGennaro, Ramon P., and James B. Thomson.** 1996. "Capital Forbearance and Thrifts: Examining the Costs of Regulatory Gambling." *Journal of Financial Services Research* 10(3): 199–211.
- Ergungor, O. Emre, and James B. Thomson.** 2007. "Systemic Banking Crises." *Research in Finance* 23: 279–310.
- Friedman, Milton, and Anna J. Schwartz.** 1963. *A Monetary History of the United States: 1867–1960*. National Bureau of Economic Research, Princeton, NJ: Princeton University Press.
- Getmansky, Mila, Andrew W. Lo, and Shauna X. Mei.** 2004. "Sifting through the Wreckage: Lessons from Recent Hedge-Fund Liquidations." *Journal of Investment Management* 2(4): 6–38.
- Gorton, Gary B.** 1985. "Clearinghouses and the Origin of Central Banking in the United States." *Journal of Economic History* 45(2): 277–83.
- Gorton, Gary B., and Lixin Huang.** 2006. "Bank Panics and the Endogeneity of Central Banking." *Journal of Monetary Economics* 53(7): 1613–29.
- Kane, Edward J.** 1989. *The S&L Insurance Mess: How Did It Happen?* Washington DC: The Urban Institute Press.
- Kane, Edward J.** 2001. "Using Disaster Planning to Optimize Expenditures on Financial Safety Nets." *Atlantic Economic Journal* 29(3): 243–53.
- Kindleberger, Charles P.** 2000. *Manias, Panics and Crashes: A History of Financial Crises*. 4th ed. New York: John Wiley & Sons.
- Melton, William C.** 1985. *Inside the Fed: Making Monetary Policy*. Homewood, IL: Dow Jones Irwin.
- Mishkin, Frederic S.** 1978. "The Household Balance Sheet in the Great Depression." *Journal of Economic History* 38(4): 918–37.
- Peek, Joe, and Eric S. Rosengren.** 2005. "Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan." *American Economic Review* 95(4): 1144–66.
- Radelet, Steven, Jeffrey D. Sachs, Richard N. Cooper, and Barry P. Bosworth.** 1998. "The East Asian Financial Crisis: Diagnosis, Remedies, Prospects." *Brookings Papers on Economic Activity* 1: 1–90.
- Santomero, Anthony M., and Paul Hoffman.** 1999. "Problem Bank Resolution: Evaluating the Options." In *International Banking Crises: Large-Scale Failures, Massive Governmental Interventions*, Benton E. Gup, ed. Westport, CT: Quorum Books: 239–63.
- Schwartz, Anna J.** 1992. "The Misuse of the Fed's Discount Window." Federal Reserve Bank of St. Louis, *Review* (September): 58–69.
- Stern, Gary H., and Ron J. Feldman.** 2004. *Too Big to Fail: The Hazard of Bank Bailouts*. Washington DC: Brookings Institution Press.
- Temin, Peter.** 1976. *Did Monetary Forces Cause the Great Depression?* New York: W.W. Norton & Company.
- Tirole, Jean.** 2002. *Financial Crises, Liquidity, and the International Monetary System*. Princeton, NJ: Princeton University Press.