Crisis Economics

A CRASH COURSE IN THE FUTURE OF FINANCE

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and

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Nouriel Roubini: To H.H., K.S., L.S., M.M., and M.W.

Stephen Mihm: To my family

Chapter 4

Things Fall Apart

Walter Bagehot was a giant in the nineteenth-century British financial world. Aside from editing *The Economist* for many years, he wrote extensively about financial crises, most famously in *Lombard Street*, published in 1873. Writing about the great banks of his day, Bagehot complained that they "are imprudent in so carefully concealing the details of their government, and in secluding those details from the risk of discussion." That veil of secrecy was all well and good in prosperous times, he observed, but in a downturn it could become a terrible liability. Suppose, he wrote, that one of the "greater London joint stock banks failed." The result "would be an instant suspicion of the whole system. One *terra incognita* being seen to be faulty, every other *terra incognita* would be suspected." In short, he concluded, "the ruin of one of these great banks would greatly impair the credit of all."

If Bagehot had been alive in 2007, he would have recognized a familiar but deeply unsettling scene: Citigroup, a financial institution with impeccable credentials but an impenetrable balance sheet, was ailing because of mysterious dealings with shadowy SIVs and conduits and a baffling assortment

of structured financial products. A big bank was in trouble, and the extent of its problem was not apparent. Other financial institutions came under suspicion; uncertainty and unease roiled the markets.

What happened next was precisely as Bagehot anticipated. The first failures of 2007 set the stage for a collapse of confidence and an evaporation of trust, not merely in the shadow banks but in conventional banks as well. In no time at all, the ordinary bank-to-bank lending that supports global finance collapsed. The reason was simple: the entire financial system was one great *terra incognita*. As one market economist at the doomed firm Lehman Brothers observed late in the summer of 2007, "We are in a minefield. No one knows where the mines are planted." The result was the paralysis of the entire financial system.

That paralysis was a function of not knowing which banks were merely illiquid and which banks were truly insolvent. To have trouble rolling over some debt because of a seizure in the markets was one thing; to be bankrupt was altogether another. In a panic, it's difficult to tell which is which, and absent any clarification, panic can only grow. When that happens, institutions can swiftly slide from illiquid to insolvent, as asset values drop amid countless fire sales.

The only thing that can reliably arrest the descent into fear and terror is a lender of last resort. Bagehot is generally credited with coming up with the idea. He believed that a bank of banks—something like the Bank of England or the Federal Reserve—must step up to the plate and lend to those caught in the crunch. The holders of what he called the "cash reserve" must "advance it most freely for the liabilities of others. They must lend to merchants, to minor bankers, to 'this man and that man,' whenever the security is good." After all, he observed, "in wild periods of alarm, one failure makes many, and the best way to prevent the derivative failures is to arrest the primary failure which causes them." Yet Bagehot was against indiscriminate bailouts: only solvent institutions should be able to gain access to loans, which would be made at penalty rates so as to discourage all but the most desperate. His philosophy has often been distilled to its essence: "Lend freely at a high rate, on good collateral."

Over the course of 2007–8, Bagehot's perceptive diagnosis, along with a deeply flawed version of his prescription, played out dramatically. Panic

struck the markets, uncertainty spread, liquidity evaporated, and central banks around the world threw lifelines to banks large and small and to financial institutions of every stripe. It was a rescue effort on a scale that Bagehot never foresaw. For this crisis, although a textbook case, was bigger, swifter, and more brutal than anything seen before. It was a nineteenth-century panic moving at twenty-first-century speed.

The Minsky Moment

By the spring of 2006, the financial system, with its extraordinary reliance on leverage—and its blind faith that asset prices would only continue to rise—was primed for a breakdown of monumental proportions. Financing increasingly depended on the sort of speculative and Ponzi borrowing that Minsky predicted. Euphoria that began in the housing sector and percolated upward throughout the entire financial system only encouraged further risk taking, and the few skeptics who raised the alarm were not heard. As Minsky himself said of these euphoric moments, "Cassandra-like warnings that nothing basic has changed, that there is a financial breaking point that will lead to a deep depression, are naturally ignored in these circumstances."

And so it was with this boom. Throughout 2006 and into 2007, one of the authors—Nouriel Roubini—warned of the coming collapse, as did a handful of other prescient commentators. In general, their warnings fell on deaf ears, much as Minsky anticipated. Naysayers at the height of a bubble, Minsky observed, "do not have fashionable printouts to prove the validity of their views," and those in the establishment inevitably "ignore arguments drawn from unconventional theory, history, and institutional analysis."

Indeed, by the time a bubble peaks, its participants do more than scorn the skeptics; they proclaim that a new age of prosperity has arrived. The particulars vary from era to era, but the language is the same. On October 15, 1929, the otherwise accomplished economist Irving Fisher announced that having dropped downward from their remarkable highs, "stock prices have reached what looks like a permanently high plateau." Likewise, in December 2005 the somewhat less accomplished (and more subjective) spokesman

for the National Association of Realtors, David Lereah, looked at a similar precrash drop and uttered this sage pronouncement: "Home sales are coming down from the mountain peak, but they will level out at a high plateau, a plateau that is higher than previous peaks in the housing cycle."

It seems quaint in retrospect, but what inaugurates a financial crisis is rarely something dramatic or out of the ordinary, merely a leveling off, a movement sideways, and a few unsettling signs. Those arrived in the spring of 2006, as housing starts flattened out, and home prices—which had doubled in real terms over the previous decade—stopped rising. The reason was simple enough: the supply of new homes began to outstrip the demand, and a rise in interest rates made variable-rate mortgages more expensive. Prices leveled off.

At the same time, as in every financial crisis, a "canary in the coal mine" signaled that all was not well: subprime mortgages issued in 2005 and 2006 began to exhibit unusually high rates of delinquent payments. These same mortgages came with features—superlow teaser rates, option ARMs, negative amortization—that depended on refinancing at low rates. But the option of refinancing—particularly for those mortgages that had no down payment and no equity—was available only if home prices kept rising. As a consequence, delinquencies and defaults started to crop up; cracks appeared in the facade.

Still, there was little indication that this was the beginning of a colossal banking crisis. But beginning in late 2006, the shadow banking system became the focus of a slow-motion run that George Bailey himself would have recognized. The hundreds of unregulated nonbank mortgage lenders who had been at the forefront of originating subprime mortgages relied heavily on short-term financing from larger banks. Once subprime mortgages were going into default at accelerating rates, the larger banks refused to renew these lenders' lines of credit. Unable to tap a lender of last resort, the nonbank lenders began to fail, victims of a twenty-first-century bank run.

The first lender to go under was the hilariously misnamed Merit Financial, which had allegedly spent all of fifteen minutes training its loan officers before setting them loose to originate loans with little documention, liar loans, and no-income, no-job NINJA loans. But Merit Financial was not alone. Other nonbank lenders may have kept up professional appearances,

but their lending practices were no less suspect. By the end of 2006, ten institutions had gone bust, and the flow of mortgages through the securitization pipeline began to slow. By end of March 2007, the number of nonbank lenders that had collapsed soared to fifty or more. On April 2 the nation's second-largest subprime lender—New Century Financial—went bankrupt after its funding dried up. At the same time, others who had battened on the business of originating mortgages—thousands of small-time mortgage brokers—went out of business.

Most market commentators claimed that the problem was restricted to one small sector of the financial system. This too often happens as financial crises gather steam: the problem is widely seen as "contained"—in this case, to a handful of reckless mortgage lenders and the loans they made. Federal Reserve chairman Ben Bernanke fell into this trap when he appeared before Congress in May 2007. While he conceded that the subprime market had plenty of problems, he portrayed these troubles as an isolated disease outbreak rather than the beginnings of a pandemic.

Then a London-based company called Markit Group introduced something called the ABX Index, which measured stress in the market for subprime securities. It did so by measuring the prices of a basket of credit default swaps, used to transfer the risk of default on securities derived from subprime home loans. The goal, a company spokesman said, was "visibility and transparency." Using the ABX, one could measure the cost of buying insurance—in the form of credit default swaps—against defaults of tranches of mortgage-backed securities and CDOs rated from an abysmal BBB to a supposedly high-grade AAA. Over the course of 2007, the ABX Index went into a free fall, as bottom-of-the-barrel tranches lost upwards of 80 percent of their value. Even the safest AAA tranches lost 10 percent by July 2007.

The fall in the ABX Index revealed that something was going horribly awry. Worse, the ABX figures made all the shadow banks look at their assets and recalculate the value of the securities they held. Collateralized debt obligations that had been worth one hundred cents on the dollar sustained enormous losses, leaving financial institutions with fewer assets relative to their outstanding liabilities. Faced with dwindling reserves, both the traditional and the shadow banks began to hoard cash, refusing to lend on the basis of collateral that looked more dubious by the day.

A sudden aversion to risk, a sudden desire to dismantle the pyramids of leverage on which profits have until so recently depended, is the key turning point in a financial crisis. In earlier times, it was called "discredit" or "revulsion"; more recently it has been called a "Minsky moment." By late spring of 2007, that moment had definitely arrived.

The Unraveling

Hedge funds may not look like banks, but they operate much as banks do, getting short-term investments from individual and institutional investors as well as short-term repurchase agreements, or repos, from investment banks. Like conventional banks, hedge funds invest their short-term borrowings for the long term. For example, two hedge funds run by Bear Stearns sank billions of short-term loans into highly illiquid subprime CDO tranches.

The collapse of those two funds in the summer of 2007 portended the fate not only of hundreds of other hedge funds but of the shadow banking system as a whole. Like many players in this system, these two funds were virtually unregulated but highly leveraged; the riskiest had a debt-to-equity ratio of twenty to one. As the ABX Index revealed the market's growing belief that subprime CDOs might lose much if not most of their value, these two hedge funds started to suffer major losses.

At that point the banks that had lent billions to the two funds made margin calls and threatened to sell the collateral—some AAA CDO tranches—that the two funds had pledged to secure financing. This step was fateful: up until now CDOs and other forms of structured finance had rarely been traded. The ABX Index was merely a proxy for prices, not an actual reflection of the going market price. The hedge fund managers knew that these securities would never fetch their original price; trying to sell them into a panicked market would have revealed that the entire CDO enterprise was, like the fabled emperor, without clothes. Instead, Bear Stearns injected money into the funds. But to no avail: by the summer of 2007, one of the funds had seen 90 percent of the capital put up by the investors of wiped out, while the equity of the more leveraged fund disappeared altogether. Both funds filed

for bankruptcy at the end of July. They were not alone: another hedge fund created by UBS perished under similar circumstances.

These early failures showed how hedge funds could fall victim to the equivalent of a bank run on their assets. Institutional creditors could suddenly refuse to roll over the repo loans, leaving them high and dry. Alternatively, those who'd invested equity—wealthy individuals and the like—could demand their money back, just as depositors used to demand money back from old-fashioned banks like Bailey Bros. Building & Loan. Either way, the result was the same: the short-term financing of the hedge funds could readily disappear, forcing them to shut their doors.

The failure of the first three hedge funds conformed to the classic narrative of a financial crisis. Most crises see a few initial high-profile failures, then a period of unsettling uncertainty, as people try to determine whether the troubles that have befallen once-healthy institutions are part of a larger problem. More often than not a larger problem is emerging, and this crisis was no different: in the two years following the failure of the Bear Stearns and UBS funds, some five hundred hedge funds perished, the victims of a slow-motion bank run. The reason was simple: the creditors of the hedge funds couldn't and didn't know how much exposure individual hedge funds had to the toxic assets. Faced with so much uncertainty, they curtailed credit to all of them.

As panic spread in the spring and summer of 2007, the search for toxic assets began apace. Investors desperately tried to figure out who else was exposed to the subprime mess. Suspicion soon fell on the off-balance-sheet vehicles that investment banks and broker dealers had created during the rush to securitization. They came in two varieties: conduits and SIVs. Both had played essential roles in the securitization frenzy: conduits had served as a holding pen at the beginning of the process, and SIVs served as a dumping ground at the end. Together they held upwards of $800 billion in assets.

Here's how they worked. As investment banks assembled mortgages and other assets, they needed a place to park them. Rather than keeping them on their balance sheets—where they would force the banks to maintain higher levels of reserves relative to the value of the assets—the banks parked them in something called a conduit, a kind of shadowy legal entity that had reserve ratios a tenth the size of ordinary banks'. There they would sit until they were

turned into mortgage-backed securities, collateralized debt obligations, and other securities. Conduits depended on financing to keep this process humming along, for which they turned to money market funds, pension funds, and corporate treasurers, who gave the conduits short-term loans using asset-backed commercial paper (ABCP).

Crucially, the loans were short-term, but once again the assets—the subprime mortgages and other forms of debt—were illiquid, long-term instruments. The same dynamic was in play at the other end of the securitization assembly line. Once the investment banks had created the securities, they inevitably encountered a bottleneck: they could not possibly shove all the new structured products down the throats of gullible investors right away. Rather than keep the assets on their balance sheets—and incur capital charges—the investment banks came up with the SIV. The purpose of this off-balance-sheet vehicle was to buy up these securities using money siphoned from the ABCP market. This was a bit like an automaker setting up a shell company to buy up unsold vehicles sitting on dealer lots.

Citigroup, which had some seven separate SIVs holding assets of $100 billion, was one of the first to falter. Just as trouble with one hedge fund sparked a panicky scrutiny of all hedge funds, trouble with one SIV sparked a more general rush for the exits by wary investors. It quickly turned into a rout: in the space of four weeks, investors moved $200 billion out of the ACBP market, and the SIVs and conduits alike had to contend with much higher costs for borrowing money from this market. Even worse, some creditors of the SIVs and conduits refused to lend money at any cost, leaving them unable to continue in their current incarnation.

As things spiraled out of control, the banks that had sponsored the SIVs and conduits found themselves in a delicate position. Originally, in order to entice investors, many of them had promised to use the bank's own liquidity in the event of a crisis, and they had even guaranteed the interest rates and value of the instruments. That put the banks on the hook for any losses. After much kicking and screaming, the banks were forced to bring their SIV exposure back onto their balance sheets, sustaining massive losses in the process.

The worst was yet to come. Beginning in August 2007, a much more severe shock—a full-blown liquidity and credit crunch—seized the financial

markets, culminating in the collapse of Lehman Brothers and bringing the global financial system to the brink of collapse. During that time the remnants of the shadow banking system collapsed, and even the conventional banking system came under assault. The crisis was just beginning.

Fear of the Unknown

Risk, Uncertainty, and Profit, first published in 1921, contains iconoclastic economist Frank H. Knight's now famous distinction between the concepts of *risk* and *uncertainty*. Risk, he argued, can be priced by financial markets because it depends on known distributions of events to which investors assign probabilities—and price things accordingly. Uncertainty, on the other hand, can't be priced: it relates to events, conditions, and possibilities that can't be predicted, measured, or modeled.

To understand this distinction, imagine two men playing a game of Russian roulette. They take a standard revolver with room for six bullets, put a bullet in the chamber, and spin it. Whoever pulls the trigger first has a one-in-six chance of blowing his brains out. That's risk. While the men playing this game may be suicidal idiots, they know the odds. Now imagine that the two men are handed a mystery gun prepared by someone else. The gun could have one bullet; it could have six; or it could have none. It may not even be a real gun; it could fire blanks instead of bullets. The players don't know. That's uncertainty: they have no idea how to assess the risk. The odds of dying are impossible to quantify.

The distinction between risk and uncertainty helps explain the financial markets from late summer 2007 onward. Until the crisis struck, risk could be reduced to the ratings slapped on various securities: some were riskier than others, and the risk could be quantified—or so it seemed. As the housing market crumbled, however, and uncertainty enveloped these securities, the financial system no longer seemed comprehensible, much less predictable. Bad things had already happened, but they paled next to what might happen next. As one journalist with the *Financial Times* put it that August during a radio interview, "It is not the corpses at the surface that are scary; it is the

unknown corpses below the surface that may pop up unexpectedly. Nobody knows where the bodies are buried."

By late summer of 2007, the balance sheets of an extraordinary range of financial institutions showed an unpleasant surprise: a diverse handful of hedge funds, banks, conduits, SIVs, and others had been forced to exhume "bodies" by revealing a bewildering array of toxic assets. Where might others lie? And how many were there? No one could know; uncertainty reigned. Estimated losses on subprime mortgages now ranged from $50 billion to $500 billion and beyond.

This development didn't fit the standard expectations or measurements of risk. When two Goldman Sachs hedge funds lost more than a third of their value late that summer, the firm sought to calm investors by claiming that these losses were "twenty-five standard deviation events." This was statistical shorthand for claiming that what had happened should occur only once in a million years. In actuality, the models used to assess risk were flawed; they used preposterous assumptions—home values could only go up!—and relied on data that went back only a few years.

A deeper appreciation of history might have prepared market watchers for what happened next: uncertainty spread, suspicion grew, and long-time bonds of trust frayed. Bagehot captured this dynamic all the way back in 1873, noting that "every day, as a panic grows, this floating suspicion becomes both more intense and more diffused; it attacks more persons; and attacks them all more virulently than at first." When that happens, the money market—the arena where banks borrow and lend surplus cash—seizes up. In Bagehot's day the epicenter of the global money market was Lombard Street, where the most important banks in England had their headquarters.

In 2007 the seizure occurred in a more amorphous international network of financial institutions—not only in London but in New York, Tokyo, and other financial centers. This was the interbank market, where banks and other financial institutions lend their surplus cash to one another. It all takes place in cyberspace, but in a testament to London's enduring place in financial history, the most important rate at which money is lent is known as the London Interbank Offered Rate (LIBOR).

In normal times, the overnight LIBOR—for loans made for the duration of a day—is only a few basis points above the overnight policy rates set

by central banks around the world. The reason for this near convergence is simple: the perceived risk of lending between established banks is only marginally higher than the risk-free lending available from central banks. Similarly, longer-term interbank loans—three-month LIBOR contracts—rarely deviate from rates associated with supersafe investments like three-month Treasury bills.

In August and September 2007 unease was rising. By that time the subprime crisis was in full swing, complete with rising delinquencies and foreclosures. The securitization pipeline clogged as ratings agencies downgraded mortgage lenders and a range of structured products. At the same time, the ABX Index revealed a marked deterioration of confidence in the value of various CDO tranches, while the unraveling of the commercial paper market continued apace. Other ominous portents appeared: stock markets became extraordinarily volatile, and hedge funds that used complicated mathematical strategies to make money off equities suffered enormous losses. Subprime mortgage lenders continued to go under, including giant American Home Mortgage. Credit spreads for corporate firms sharply rose. A run on some money market funds overseen by BNP Paribas only added to the sense that things were going horribly, terribly awry. So did ruptures in the "carry trade," where investors borrowed in low-interest-rate currencies and invested them in high-interest-rate currencies. The crisis was no longer an isolated problem; it was spreading into new and dangerous territory.

As a consequence, the interbank market tightened in August, and the spread between LIBOR and the rates charged by European central banks soared, from 10 basis points to about 70. This was extraordinary, signaling that liquidity in overnight money markets had largely dried up; banks that had previously done business confidently now looked suspiciously at one another's finances, fearful that untold numbers of "bodies" might be lurking on or off the balance sheets. Every bank in Europe and the United States wanted to borrow cash, but no bank would lend it, except at extraordinarily high rates.

Predictably, central banks rode to the rescue—or tried to do so. On August 9 the European Central Bank lent €94.8 billion to some fifty banks; the next day it lent another €61 billion. The Federal Reserve joined the fire brigade as well, lending some $60 billion over the course of two days. Though these infusions helped close the LIBOR spread in the early fall, it

widened once more in November and December as bank losses mounted, stock prices plummeted, and panic spread still further. The Federal Reserve cut its rates by 100 basis points that fall, but to no avail. The Fed also made it easier for banks to borrow from its discount window, but there was a stigma associated with doing so. Any bank that needed to go to the Fed for funds might be perceived as weak and on the brink of collapse.

These events followed a familiar pattern. Hard evidence was growing that things were bad and getting worse by the day; it was not a matter of rumor or conjecture. According to the ABX Index, CDO values continued to erode, and even the AAA-rated supersenior tranches were losing value by the day. The ratings agencies, in a rush to compensate for their negligence during the boom years, downgraded the ratings of a range of securities. As for the securitization market, it was effectively frozen. Mortgages and other forms of debt that had served as ingredients in the sausage making of structured finance now accumulated, unused and unwanted.

By the end of 2007, profound uncertainty prevailed. Which banks had bodies buried off their balance sheets? Which hedge funds had placed foolish bets? Who else had invested in subprime CDOs? Unfortunately, it was next to impossible to tell. The financial system was extraordinarily opaque, and much of its activity—credit default swaps, for example—took place outside the purview of regulated exchanges. Increasingly it resembled a vast minefield. A few of the mines had gone off, but most remained buried, waiting for the unsuspecting.

Illiquid and Insolvent

In the late summer of 2007, when the Bank of England first threw a lifeline to British banks, Mervyn King, the governor of that institution, had tough words for insolvent banks begging for a bailout. "We are certainly not going to protect people from unwise lending decisions," he grandly proclaimed.

The subtext was clear: if central banks were going to play their role as lenders of last resort, they would help only the deserving. He was speaking a language that Walter Bagehot would have appreciated. As Bagehot had

ounseled, "Any aid to a present bad Bank is the surest mode of preventing he establishment of a future good Bank."

Now as then, the difficulty lies in distinguishing between banks that are nerely illiquid (the "good" ones) versus those that are insolvent (the "bad" ›nes). Or to put it another way, the challenge is to figure out which banks ıave more assets than liabilities, even if these assets can't readily be converted o cash; and which banks have more liabilities than assets, effectively wiping ›ut the banks' capital and thereby driving them into insolvency.

The problem with teasing out this distinction in the midst of a panic is that financial institutions can readily move from one state to another, depending on, say, the changing value of the assets they hold. This question of valuation was particularly complicated in the recent crisis. Take, for example, the CDOs held by banks and other financial institutions. In the early months of the crisis, the ABX Index implied that the value of CDOs was declining. But that was not the actual market value: it was merely a reflection of the cost of insuring against future defaults. Early on, banks reasonably argued that these implied losses were theoretical, not real: the actual default rates on the underlying mortgages had not yet approached the levels implied by the index.

The thinking was that irrational panic was driving the markets. The banks blamed the losses on market psychology alone, be they the declines implied by the ABX Index or even the real declines in the prices of assets such as stocks. Once investors regained their sanity, it was thought, prices would return to their normal levels. The markets would become more liquid, and the threat of insolvency would subside. At least, that was the theory.

This thinking was naïve. The crisis was never merely a function of illiquidity alone; plenty of insolvency was involved as well. That became apparent when the unthinkable happened: rates of delinquency and of defaults on mortgages started to soar, and the cash stream from these assets collapsed. Hypothetical losses on the "safe" supersenior AAA tranches became real losses, and the value of those assets fell. The value of mortgage-backed securities, collateralized loan obligations, corporate bonds, and municipal bonds fell too.

Even the banks' plain-vanilla assets hemorrhaged: that is, ordinary residential mortgages, commercial mortgages, credit card portfolios, auto loans,

student loans, and other forms of consumer credit. Banks had also made commercial and industrial loans or helped finance leveraged buyouts of firms. All of these loans deteriorated, especially after the United States entered a recession at the end of 2007.

These developments highlighted that a bank's health is a fleeting, impermanent thing. As long as the prices of underlying assets continued to fall, banks in good standing saw their positions deteriorate, bringing them to the brink of insolvency. Of course, they could also collapse if they suffered a run on their liabilities. The shadow banks were clearly vulnerable on this point, given that they lacked deposit insurance. Conventional banks were not—or so the thinking went.

Nonetheless, once the run on the shadow banking system gathered steam, ordinary banks became targets of bank runs for the first time since the 1930s. One of the first to go was Countrywide Bank, the savings arm of Countrywide Financial, the nation's largest mortgage lender. Founded by Angelo Mozilo, the lender had been at the center of the subprime crisis. As conditions worsened, doubts about the firm rose and eventually spilled over to its banking division. In August 2007 depositors rushed branches of Countrywide Bank, clamoring for their money in a way not seen for decades. One retiree waiting in line outside a branch captured the spirit of the panic when he told a reporter, "I'm at the age where I can't afford to take the risk. I'll gladly put it back as soon as I know the storm is over."

Words like these were uttered during panics in Bagehot's time, but to hear them spoken in the twenty-first century was remarkable. Even more extraordinary, bank runs spread around the world. Northern Rock, a sizable British mortgage lender with a banking arm, suffered Countrywide's fate the following month. Like Countrywide, most of its funding came from sources other than ordinary depositors, but that didn't stop its ordinary depositors from lining up outside its branches in mid-September, under the glaring lights of the global media. The Bank of England intervened, offering emergency lines of liquidity, but still the run did not stop. "I don't think the bank will collapse—but we just don't have the nerves," explained one depositor. "I'm taking the money out to get peace of mind."

As the run continued, fears mounted that other well-regulated banks with deposit insurance might suffer runs as well, then spiral from illiquidity

to insolvency. As irrational as these bank runs may have seemed, depositors actually did have reason to worry. Like Countrywide, Northern Rock offered deposit insurance only up to a certain point: $100,000 in the case of Countrywide, and £30,000 in the case of Northern Rock. Plenty of depositors had sums well in excess of these amounts, and should the bank become insolvent—with or without the support of a lender of last resort—they would lose their savings. In fact, in the United States in 2007, some 40 percent of conventional deposits were uninsured. Bank runs, in other words, were rather rational.

The cases of Countrywide and Northern Rock highlighted the difficulties of channeling aid only to "good" banks as opposed to "bad" ones. Banks were well on the road to insolvency, if not there already; by normal standards, they deserved neither lines of liquidity nor additional insurance for depositors. But what sounds good in theory is hard to put into practice during a crisis, when depositors storm banks and the financial system crumbles. The Bank of England's Mervyn King found himself in precisely this awkward position. A month after lecturing the market about letting bad banks fail, he reversed course, promising to insure all of Northern Rock's deposits and offering additional lines of liquidity to the beleaguered bank. That blanket deposit guarantee was soon extended to all banking institutions throughout the United Kingdom. Most other countries eventually followed suit or, at the very least, raised the deposit insurance ceiling.

These interventions were just the beginning, but for a brief period in the winter of 2007 and 2008, some claimed that the crisis was over: the markets seemed to settle down. As any student of crisis economics should have known, this was an illusion. More often than not, crises wane before waxing anew; a period of calm may precede even worse outbreaks of panic and disorder.

The Eye of the Storm

In May 1930 President Herbert Hoover confidently announced that "we have been passing through one of those great economic storms which periodically bring hardship and suffering upon our people. . . . I am convinced

we have now passed through the worst—and with continued unity of effort we shall rapidly recover. There has been no significant bank or industrial failure. That danger, too, is safely behind us." Another day in May seventy-eight years later, Treasury Secretary Henry Paulson confidently announced, "The worst is likely to be behind us," adding a week later that "we are closer to the end of the market turmoil than the beginning."

Both Hoover and Paulson were making the classic error of those caught in a financial hurricane, mistaking the eye of the storm for the end of the crisis. They were hardly the only wise men to make such pronouncements in the midst of a meltdown; every crisis has its share of optimists who at some point declare the worst is over. Interestingly, this kind of optimism is usually genuine; it's not an attempt to jawbone markets but generally reflects a real belief that the storm has passed.

Unfortunately, financial crises usually ebb and flow in their severity; they rarely hit once and then subside. They resemble hurricanes in that they gather strength, weaken for a while, and then gain even more destructive power than before. This reflects the fact that the vulnerabilities that build up in advance of a major crisis are pervasive and systemic. They cannot be cured by the collapse or bailout of a single bank, or even the implosion of an entire swath of the financial sector.

Many crises follow this pattern. For example, in Britain the crisis of 1847 erupted in two distinct stages in April and October of that year; the crisis of 1873 was even more complicated, surfacing and subsiding in Vienna in April, reappearing with a vengeance in the United States that September, and then flattening much of Europe in November. The Great Depression was the most complicated of all, with a blowup on Wall Street, multiple bank runs interspersed with periods of relative calm, and different financial centers around the world erupting in panic at different times over the course of three years.

In the winter of 2007–8, surprisingly, a semblance of calm settled over the markets. As the fall turned to winter, write-downs and losses were reducing the capital of financial institutions to new and dangerous lows. Many banks circled their wagons, lending less, increasing their lending standards, and limiting their exposure to risky assets. Nonetheless, the value of assets continued to fall, while liabilities rose. Regulators in both the United States

and Europe suggested that banks raise more capital to buttress their balance sheets.

Given that the entire financial system was in the same boat, the banks had few places to turn. Their solution was to go hat in hand to sovereign wealth funds, investment vehicles owned by foreign governments in the Middle East and Asia. The prospect of Saudi Arabian and Chinese investors controlling American and European banks was politically untenable, so the recapitalization of the troubled banks took the form of preferred shares. This meant in practice that sovereign wealth funds received only a minority stake, no board membership, and no voting rights.

Citigroup raised $7.5 billion from a fund in Abu Dhabi; UBS got $11 billion from Singapore's fund and a group of private investors from the Middle East. Singapore's fund sank $5 billion into Merrill Lynch, while China sank another $5 billion into Morgan Stanley. In a smaller-scale effort, American private equity firms pumped $3 billion into Washington Mutual and close to $7 billion into Wachovia.

These infusions helped give the illusion that things might be stabilizing. So did the actions of the Federal Reserve. In December the Fed along with other central banks started to provide long-term loans to banks. The Term Auction Facility (TAF), created in coordination with the European Central Bank and the Bank of England, was designed to unclog the interbank lending market by providing longer-term loans to banks. At the time of its creation, interbank loans lasting one, three, and six months had all but dried up, and the spread between LIBOR rates and central bank rates had risen to unprecedented highs.

At first the TAF was successful in reducing stress in the interbank market. One measure of stress—the LIBOR-OIS spread—fell from 110 basis points to below 50. The measure seemed to give the economy some breathing room, and there was hope that the worst had passed. "I'm optimistic about the economy," said President George W. Bush to the press on January 8, 2008. "I like the fundamentals, they look strong." He acknowledged some clouds on the horizon but remained upbeat: "We'll work through this period of time . . . the entrepreneurial spirit is strong."

In fact, the U.S. economy had formally entered a recession the previous month, and the entire financial edifice was on the verge of crumbling. The

crisis was about to enter its most dangerous and dramatic stage. Like Hoover's relief that there had been no "significant" failure in the spring of 1930, Bush's conviction that things had stabilized was extraordinarily complacent. The levees were about to break.

The Reckoning

Like the current crisis, the panic of 1825 was a speculative bubble gone horribly awry. That fall a single bank failure eventually triggered a massive run on all the banks. At first the Bank of England did nothing, refusing to intervene. As the crisis spiraled out of control, pressure built for the government to do something—anything. In December 1825 the Bank of England reversed policy and began lending money in new and unconventional ways. The Bank became the lender of last resort to virtually every participant in the financial system. The results, Bagehot recalled, were dramatic. "After a day or two of this treatment, the entire panic subsided, and the 'City' was quite calm."

This narrative—a central bank compelled to adopt extreme, unprecedented measures to arrest the panic—would play out numerous times in the succeeding decades, and 2008 was no exception. In the recent crisis, however, the Federal Reserve and other central banks could not—and did not— immediately bring the crisis under control. One reason was that central banks were in uncharted territory: the size and scope of the meltdown made many of the usual tools useless. Worse, many of the institutions in the deepest trouble—investment banks and other members of the shadow banking system—lacked ready access to the lifelines that had served central bankers so well in previous crises. The central bankers caught in the midst of the crisis would have to improvise, much as their predecessors had done nearly two centuries ago.

In the spring of 2008 the pressure to do something quickly mounted. By then the securitization pipeline had all but shut down, not only for ordinary mortgages but for credit card loans, auto loans, and other consumer credit products. The securitization of corporate loans and leveraged loans

into collateralized loan obligation froze up, a victim of plummeting demand and growing aversion to risk. When the credit markets shut down, banks and investment banks found themselves stuck with the loans, unable to turn them into securities and sell them off. They also found themselves stuck with $300 billion worth of bridge loans that gave temporary financing to private equity funds putting together leveraged buyouts. Banks and broker dealers trying to sell off these loans quickly realized that assets with a par value only a few months earlier were now selling into extremely illiquid markets at a steep discount.

All this was playing out against the backdrop of deterioration in a range of asset classes. The stock market continued to stumble downward, and banks continued to announce write-downs and losses as diverse structured financial products saw their ratings downgraded and their values plummet. Even AAA tranches of CDOs saw their ratings cut, and their prices fell by 10 percent or more. While banks and broker dealers could use accounting tricks to conceal some of the growing losses, structured financial products like CDOs had to be valued at the prevailing market price.

The net result of these declines—in assets both esoteric and conventional—was that banks had to announce write-downs on their asset portfolios. By March 2008 banks around the world announced write-downs of over $260 billion. Citigroup alone took a $40 billion write-down, and other big banks would post comparable figures. Many of those that went public with their losses at this time may not have been insolvent yet, but their days were numbered. Two institutions whose troubles would dominate the headlines in the coming months, AIG and Wachovia, posted write-downs of $30 billion and $47 billion, respectively.

Ordinary commercial banks were suffering, but the investment banks suffered first. Some of them, such as those attached to commercial banks—the units embedded in Citigroup, JPMorgan Chase, and Bank of America—could rely on the support of their parent companies. But the independents—Lehman Brothers, Merrill Lynch, Morgan Stanley, Goldman Sachs, and Bear Stearns—were on their own. Like ordinary banks, they borrowed short and lent long, but they did not have access to a lender of last resort, and their creditors could not rely on deposit insurance if things went awry. Worse, being less regulated, they tended to be much more leveraged. They were also highly dependent on short-term financing in the repo market.

None of the independent broker dealers would remain by the end of the year. The first to go was Bear Stearns in March 2008. Like its counterparts, it had been a big player in running CDO assembly lines, and it had kept plenty of now-toxic securities on its books. Losses mounted in the fall and winter of 2007 as the value of CDOs—particularly AAA tranches—eroded. There was a growing sense of clarity in the market: Bear Stearns was in trouble, and like the depositors who withdrew their money from Countrywide, Northern Rock, and other banks, the hedge funds borrowing from Bear Stearns and other firms lending funds to the ailing investment bank pulled their money. On March 13 the besieged bank reported that 88 percent of its liquid assets were gone, the result of creditors' refusing to roll over short-term financing. Bear Stearns was moribund, and over a frantic weekend the legendary firm was summarily sold off to JPMorgan Chase. The Federal Reserve intervened heavily, facilitating the sale and agreeing to assume most of the future losses tied to the former firm's toxic assets.

The Federal Reserve's move was not a full bailout; Bear Stearns's shareholders were effectively wiped out. But its creditors and counterparties were fully bailed out. Instead, the Fed made a classic central bank move, as if following Bagehot's admonition to rescue the bank whose failure threatens otherwise solvent banks. In Bear Stearns's case, it deemed such intervention necessary: the firm had been a big player in selling credit default swaps against a variety of risky assets held by other banks and investors. Its collapse would have nullified those insurance contracts, potentially triggering "derivative failures" throughout the global financial system.

But the Federal Reserve was not finished intervening. Much as the Bank of England had used swaps in 1825, the Federal Reserve began exchanging liquid, safe short-term Treasury bills for the more illiquid assets that were weighing down the balance sheets of the investment banks. This lending facility (which we will discuss in chapter 6) helped the banks contain the illiquidity trap that the panic created. So did the Federal Reserve's subsequent creation of another lending facility that gave investment banks like Goldman Sachs and Morgan Stanley access to lender-of-last-resort support.

This was a radical break with past precedent: for the first time in decades, the government had opted to provide such support to key members of the shadow banking system.

The creation of the two new lending facilities reduced but did not eliminate the risk that the broker dealers would suffer a run. For starters, the broker dealers did not have access to deposit insurance, arguably the strongest shelter against a bank run. Moreover, their access to the lender-of-last-resort support of the Federal Reserve was conditional and limited. If a broker dealer was truly insolvent, the Federal Reserve would refuse to ride to the rescue. Or so prudent central banking practice would dictate. That almost guaranteed there would be some more high-profile failures.

At the same time, the bailout of Bear Stearns seemed to indicate that the Federal Reserve was unwilling to stand on the sidelines if the failure of a financial institution would sow panic on a global scale. Bear Stearns was but the smallest of the independent broker dealers; surely, the reasoning went, the Federal Reserve would step in to save a bigger victim if doing so would stop the crisis from spreading further. Allowing such a failure would risk a meltdown of the entire global financial system.

Both views had merit. Unfortunately, both turned out to be correct. What happened in the succeeding months sent contradictory messages about whether the Federal Reserve would hold the line on moral hazard.

The Center Cannot Hold

Whenever the narrative of a financial crisis is dominated by a high-profile failure, there's a temptation to see the entire crisis through the prism of that one event, as if all that came before and after can be reduced to a specific inflection point. In the recent crisis, the failure of Lehman Brothers played this role: many market watchers are convinced that it, more than anything else, was responsible for turning the American crisis into a worldwide conflagration.

This interpretation is understandable: reducing a crisis to one spectacular failure simplifies an extraordinarily complex chain of events. Unfortunately, it's misleading. The failure of Lehman Brothers was less a cause of the crisis than a symptom of its severity. After all, by the time Lehman announced it would file for bankruptcy on September 15, 2008, the United States had been in a severe recession for ten months, and other industrial economies were on the verge of entering one. The housing bust was entering its second year, and high oil prices were sending shock waves through the global economy. Some two hundred nonbank mortgage lenders had collapsed, and as securitization ground to a halt, SIVs and conduits had unraveled. Conventional banks were in trouble too: their balance sheets continued to deteriorate in 2008, and new write-downs inevitably followed. After showing some signs of improvement over the winter, interbank lending had seized up yet again in the spring and summer.

The institutions charged with backing up the system—smaller insurers like Ambac and ACA, which specialized in guaranteeing bond payments (also known as monoline insurers), as well as sprawling insurance companies like AIG—were also deep in trouble long before Lehman collapsed. Using credit default swaps, they had insured several trillion dollars' worth of CDO tranches, effectively transferring their own AAA ratings onto a range of structured financial products. As the tide of losses rose, it looked increasingly likely that the insurers would be forced to pay out. Unfortunately, they didn't have the capital, thanks to being wildly overleveraged. The ratings agencies knew this and started to downgrade the monolines in the fall of 2007.

These real and looming downgrades threatened to rob companies like Ambac and AIG of their ability to confer AAA ratings on a range of securities. In the case of the smaller companies like Ambac, that meant not only CDOs but the municipal bonds that had been their original bread and butter. In the spring of 2008 the deepening troubles of the monoline insurers plunged the usually boring (but reassuringly stable) municipal bond markets into turmoil. Many of the investment banks that had previously played a pivotal role in these markets abandoned the field, fearful of potential losses. Auctions of municipal bonds started to fail, and panic spread throughout the market. Much of the more complex short-term financing used by these municipalities—auction-rate securities and tender option bonds—also collapsed. In a matter of months, state and local governments that were otherwise solvent saw the costs of borrowing soar.

This facet of the crisis began as a matter of illiquidity, but here too the

specter of insolvency loomed: many municipalities that had profited from rising property values in the good times saw tax revenues fall off a cliff in the face of escalating delinquencies and foreclosures. The growing troubles of California, already evident in the summer of 2008, offered a glimpse of what lay in wait for other states and municipalities. The problem was real; it wasn't merely a matter of investor psychology.

Fannie Mae and Freddie Mac started to falter too. These enterprises, sponsored by the federal government, had leveraged themselves at ratios of forty to one by issuing debt that enjoyed the implicit backing of the U.S. Treasury. They had used part of that supposedly risk-free debt to purchase risky mortgages and asset-backed securities. By 2008 both institutions were sustaining massive losses that rapidly eroded their capital. Those losses came from two sources. For starters, the fee they received for guaranteeing the mortgages that they manufactured into mortgage-backed securities proved insufficient to cover their losses. In the worst housing crisis since the Great Depression, even safe "prime" borrowers started to default, at rates far in excess of what Fannie Mae and Freddie Mac had anticipated. The insurance premiums no longer covered the losses, which now surfaced on the two institutions' balance sheets.

Far more significant was the fact that their investment portfolios were bursting with subprime mortgages and subprime securities. That summer the losses on these investments had become so large—and the two institutions' capital had so dwindled—that investors panicked. Fears grew that the duo might no longer be able to cover the securities they had guaranteed. Even worse, investors who had purchased debt issued by the two giants now openly talked about the possibility of a default. The assumption that the U.S. government stood behind that debt had never been tested.

Here again the question of moral hazard came to the fore. Without a government takeover, the failure of Fannie Mae and Freddie Mac would clearly send financial markets and mortgage markets into a panic of unprecedented proportions, never mind spook the various foreign creditors that had purchased their debt. Here much more was at risk than the market for a bunch of subprime mortgages: the creditworthiness of the United States was at stake. Letting the two institutions fail in the name of sending a message to the markets was not an option.

The result was another government takeover, formalized in September. Its terms protected those who had purchased the debt of Fannie Mae and Freddie Mac, but the common and preferred shareholders alike saw their investments wiped out. Unfortunately, many of the preferred shareholders included scores of regional banks, who overnight saw their "risk-free" investments wiped out. These losses sent further shock waves reverberating through the collapsing financial system.

On the eve of Lehman's failure, much of the damage had already been done. Lehman and the other investment banks, most obviously Merrill Lynch, were floundering, awash in losses due to exposure to a range of toxic assets; their ability to remain liquid, much less solvent, was in serious doubt. All the financial system needed to plunge into a state of utter panic was a little push.

Mere Anarchy Is Loosed upon the World

The panic of 1907 has a special place in the history of financial disasters. More than most, it has a hero, the banker J. P. Morgan, who occupied a singular place in the financial firmament as the biggest and most powerful banker of the day. In fact, in the days before the Federal Reserve, Morgan was the closest thing the United States had to a lender of last resort. The panic had begun in a series of lightly regulated, overleveraged financial institutions that were the forerunners of today's shadow banking system. Like twenty-first-century investment banks, the "investment trusts" of Morgan's day operated with little transparency.

The panic felled some secondary players, then detonated under the mighty Knickerbocker Trust Company. From there it spread swiftly, threatening to consume the other banks and trusts caught in the tangled web that bound together the financial community. Morgan was unable to save the Knickerbocker, but he decided to draw the line at another ailing institution, the Trust Company of America. The crisis seesawed for days and eventually culminated in a private meeting at Morgan's enormous private library,

where he gathered together the city's financial movers and shakers on a Saturday.

Morgan asked them to pool their resources and rally behind the Trust Company of America. The bankers initially refused, and deliberations dragged into Saturday night. At some point in the wee hours of the morning, the bankers realized that Morgan had locked them in the library and pocketed the key. He then issued an ultimatum: support the ailing Trust Company, or face the likelihood of complete annihilation in the ensuing panic. As he almost always did, Morgan got his way: the meeting broke up at 4:45 that morning after the bankers signed a mutual aid agreement. The panic was soon over.

On a very similar weekend 101 years later, Treasury Secretary Henry Paulson tried to pull off an equally audacious bit of brinksmanship. As Lehman Brothers and Merrill Lynch slid inexorably toward insolvency, he called the city's financial elite into the office of the Federal Reserve in Lower Manhattan on Saturday, September 13, 2008. Summoning the spirit of Morgan, he told the assembled bankers that the duty of dealing with the panic would rest with all of them. "Everybody is exposed," he reportedly told the assembled bankers, hoping this would prod them to come up with some way of either buying Lehman or organizing its orderly liquidation.

The bankers came back the following morning but left later that day without a deal; Lehman would be allowed to go under. Paulson's attempt to channel J. P. Morgan had failed. By this time Merrill Lynch was rushing into the arms of Bank of America, fearful of sharing Lehman's apparent fate. "We've reestablished moral hazard," claimed one person present at the meetings. "Is that a good thing or a bad thing? We're about to find out."

Much of what happened in the succeeding days and weeks was probably inevitable, even without the dramatic collapse of Lehman. But the speed with which it happened, and the drama that accompanied it, was a function of the shock waves that Lehman's failure sent through the financial markets.

Those shock waves hit AIG first. On September 15, Lehman declared bankruptcy, and all the major ratings agencies downgraded AIG's credit rating. Its losses had been mounting for months, but the downgrade was the coup de grâce: it effectively called into question the guarantees that the insurance giant had bestowed on a half trillion dollars' worth of AAA-rated CDO

tranches. The day of the downgrade, the U.S. government threw the firm an $85 billion lifeline; additional funds would flow in the coming months. In exchange, AIG became a ward of the state: most of the firm's common stock now belonged to the government.

It was a bailout not so much of AIG as of all the banks that had purchased insurance from AIG. In the wake of the takeover, the U.S. government went to those banks and bought back the CDO tranches that AIG had insured. It could have demanded that the banks take a "haircut"—a loss—on those tranches as a penalty for their foolishness in trusting AIG to make them whole. But it did not. Instead, the government paid one hundred cents on the dollar—the full value—even though the market value of the tranches had fallen far below that. By this time, any talk of holding the line against moral hazard had gone out the window.

The parts of the financial system that had so far escaped the crisis now descended into the abyss. Money market funds were one of the first to fall. The funds were supposed to operate reliably: they took cash from investors and sank it into safe, liquid short-term securities. Though a handful had stumbled the previous summer, in the wake of Lehman's bankruptcy things went completely awry. One of the most prominent funds, the Reserve Primary Fund, "broke the buck," meaning that a dollar invested with it was no longer worth a dollar. This was almost unprecedented, and it sparked a run on the fund.

Was the run even remotely rational? Yes. It turned out that the Reserve Primary Fund had surreptitiously sunk some of its investors' money into toxic securities such as Lehman's debt. When this fact came out, suspicion fell on the entire $4 trillion money market industry, which became one big *terra incognita*, and the kind of dangerous uncertainty that Frank Knight had first described swept the field. In no time the federal government was forced to provide a blanket guarantee—the equivalent of deposit insurance—to all existing money market funds.

The panic in the money market funds quickly spilled over into other arenas, beginning with the market for commercial paper, the debt that ordinary corporations used as their main source of working capital. Money market funds had been primary purchasers of this kind of debt, and when their fortunes turned, the commercial paper market seized up too. Perfectly solvent

corporations found themselves shut out of the market as borrowing rates went through the roof. For a few weeks during this liquidity crisis, corporate borrowing effectively collapsed, and blue-chip firms found themselves short of cash.

Emergency times call for emergency actions. The collapse of the commercial paper market, which handled some $1.2 trillion in loans, posed the risk that otherwise solid corporations would go insolvent because of a run on their short-term liabilities. In order to avoid any further runs, the Federal Reserve opted to extend lender-of-last-resort support to nonfinancial corporations. On October 7 it set up yet another lending facility that made loans to corporations issuing commercial paper, though only firms with an A rating or better could borrow from the Fed. This was a belated gesture at holding the line against moral hazard.

Otherwise the federal government drew no such distinctions. In the wake of the collapse of IndyMac that summer, the threat of further bank runs loomed. Washington Mutual and Wachovia, two of the nation's largest banks, started to bleed deposits. Both were effectively insolvent, yet government officials were eager to prevent their collapse. The Office of Thrift Supervision first took over Washington Mutual before brokering its sale to JPMorgan Chase. Four days after the seizure and sale of Washington Mutual, the FDIC invoked emergency powers to facilitate the sale of Wachovia, initially to Citigroup and ultimately to Wells Fargo.

The two remaining independent investment banks—Goldman Sachs and Morgan Stanley—had opted not to wait for lifelines; both saw their positions erode precipitously in the wake of Lehman's failure, and by the end of September both applied to become bank holding companies. Doing so gave them access to lender-of-last-resort support and, no less important, enabled them to look to more traditional means of underwriting their activities, namely old-fashioned bank deposits. This move came with a steep price tag: much more stringent regulation of their activities. Their conversion marked a pivotal moment in the nation's financial history: in the space of seven months Wall Street had been utterly transformed, with all five independent investment banks destroyed, absorbed, or temporarily muzzled.

Yet the transformation of banking was still not complete. Despite the fact that the Federal Reserve raised the limits on deposit insurance, banks

still faced the threat of runs, though from a new quarter. Many banks had other liabilities besides their deposits, most notably the bonds they issued to finance their assets. These bonds came with different maturities and with different levels of seniority. As bank bonds came due in the final months of the financial crisis, banks could not roll over this debt at the same rate. Borrowing money became extraordinarily expensive, and banks faced the prospect of yet another run on their liabilities.

The solution was to have the government guarantee all of the principal and interest on this kind of debt. On October 14 the FDIC announced that it was insuring all new senior debt (the debt that must be repaid ahead of junior "subordinated debt") of regulated financial institutions, including both ordinary banks and bank holding companies. This guarantee was an unprecedented intervention in the banking system. It meant that banks could now issue debt at the sort of low, "no-risk" rates enjoyed by the U.S. Treasury when the government issued debt. Within six months, banks and other financial institutions that qualified managed to roll over a massive $360 billion worth of debt at extremely low rates. Similar guarantees soon fell into place throughout Europe. Early in the fall a number of enormous European banks—Hypo Real Estate, Dexia, Fortis, and Bradford & Bingley—teetered on the brink of collapse. Ireland was the first to guarantee the debt of its banks, followed by the United Kingdom, which announced something called the Credit Guarantee Scheme. In October other European countries along with Canada followed suit, announcing that they too would guarantee the debt of their banks. These blanket guarantees had the desired effect: the risk of a bank run subsided.

By late fall the most dramatic phase of the crisis was subsiding, though all manner of other bailouts and interventions took place; lines of credit were given to everything from car companies like General Motors to finance companies like GE Capital. Most of this was done with little attention paid to whether the recipients were solvent or even worth saving; the only goal was to stop the panic.

This willingness to lend arrested the panic, though the aftershocks would continue for months, if not years. But the uneasy calm came at a great cost. Walter Bagehot and many theorists of central banking had warned against lending indiscriminately in times of panic; lenders should distinguish

between the illiquid and the insolvent and lend only at what Bagehot called "penalty" rates. This time around central bankers saved both bank and many nonbank firms, giving access to lines of credit at rates that were far from punitive. Indeed, the mother of all banklike runs had swept nonbank mortgage lenders, SIVs and conduits, hedge funds, interbank markets, broker dealers, money market funds, finance companies, and even traditional banks and nonfinancial corporate firms. Since banks were not lending to each other or to nonbank financial firms or even to nonfinancial corporate firms, central banks were forced to become lenders of first, last, and only resort. The storm engendered little in the way of the "creative destruction" that Joseph Schumpeter would have celebrated. Instead, strong and weak alike remained in a state of suspended animation, awaiting the final reckoning.

Chapter 5

Global Pandemics

An old saying in financial markets has it that "when the United States sneezes, the rest of the world catches a cold." However clichéd, that observation contains plenty of truth: the United States is the biggest, most powerful economy in the world, and when it gets sick, countries that depend on its insatiable demand for everything from raw commodities to finished consumer goods find themselves in trouble too.

This dynamic takes on dangerous potency in times of financial crisis. An outbreak of some financial disease in the world's economic powerhouse can swiftly become a devastating global pandemic. A crash in the stock market, the failure of a big bank, or some other unexpected collapse at the epicenter of global finance can become a countrywide panic and then a worldwide disaster. It's a scenario that has played out many times, whether in Britain in the nineteenth century or in the United States since that time.

Nevertheless, as the United States succumbed to the subprime disease late in 2006 and 2007, conventional wisdom held that the rest of the world would "decouple" from the financially ailing superpower. This idea, first promoted by analysts at Goldman Sachs and then taken up as the consensus,

argued that the booming economies of Brazil, Russia, India, and China would rely on domestic demand and get through the crisis unscathed by the subprime meltdown. The world's economic upstarts would escape the curse of history.

So too would Europe, where many people clung to a similar belief. Only the United States, so the thinking went, had practiced *le capitalisme sauvage*, as the French disparaged it, and it alone would suffer the consequences. In September 2008 German finance minister Peer Steinbrück declared, "The financial crisis is above all an American problem," and added, "The other G7 financial ministers in continental Europe share this opinion." But a few days later much of the European banking system effectively collapsed. Germany was forced to bail out banking giant Hypo Real Estate, and Steinbrück conceded that Europe was "staring into the abyss." Bailouts of European megabanks soon followed, and Ireland issued a blanket guarantee for its six biggest lenders. Other nations in Europe followed suit, including Britain, which effectively nationalized much of its banking system. By October 2008 many European countries as well as Canada had gone so far as to guarantee not only the deposits but the debts of the banks as well.

Nor was the crisis confined to Europe and Canada. It hammered countries on every continent, including Brazil, Russia, India, and China. In some cases this shared affliction was a matter of global interdependence: the crisis rippled through various channels, infecting otherwise healthy sectors of other countries' economies. But the contagion metaphor, so frequently invoked, does not fully explain the crisis. It was not simply a matter of a disease spreading from a sick superpower to otherwise healthy countries. Other nations, having long pursued policies that fostered homegrown bubbles, were vulnerable when the crisis struck. Indeed, what initially seemed like a uniquely American ailment was in fact far more widespread than anyone wanted to acknowledge.

All of this caught most commentators by surprise. Having missed the crisis in the United States, many bullish financial pundits clung to the decoupling thesis until it was impossible to defend. By the end of 2008 most of the world's advanced economies had slipped into a recession, and numerous emerging-market economies in Asia, Eastern Europe, and Latin America had succumbed as well. Many of these same economies suffered the stock market

meltdowns, banking crises, and other dramatic distresses that had first surfaced in the United States. What began as one country's crisis thus became a global crisis. As usual, this was nothing new or out of the ordinary. The crisis was following a path well worn by centuries of historical precedent. It was, in more ways than one, a blast from the past.

Financing a Pandemic

Crises rarely cripple perfectly healthy economies; usually underlying vulnerabilities and weaknesses set the stage for a collapse. Nonetheless, for economies outside the United States to catch the proverbial cold, some channel had to be in place. The most visible were the institutions that make up the global financial system.

Money markets are one such institution: they're the places where banks and other financial firms borrow and lend money on a short-term basis. These webs of debt and credit have always been fragile in times of panic, spreading problems from one part of the global economy to another. The reason is simple: when one link in the very elaborate chain breaks and defaults on some debt, it can leave creditors dangerously short of funds, unable to guarantee the credit of other firms. In this way, the consequences of one failure can spread throughout the entire money market.

For this reason, troubles in the money market have long been a hallmark of financial crises. In the panic of 1837, the Bank of England refused to roll over loans made to three major British financial firms, whereupon those firms failed. The effect was calamitous: the firms had extended short-term loans to merchants around the world, and their collapse voided tens of millions of pounds' worth of commercial paper. Financiers in Liverpool, Glasgow, New York, New Orleans, Montreal, Hamburg, Antwerp, Paris, Buenos Aires, Mexico City, Calcutta, and elsewhere found themselves short of credit. *The Times* of London lamented, "It must be a very long time, years perhaps, before the entire effect of these failures is known, for they will extend more or less over the whole world."

Those words could well have been uttered in the wake of any of the

crises that crippled international money markets in the nineteenth and early twentieth centuries. The worst crises typically followed the unexpected collapse of some venerable firm that occupied a prominent place within the global money market. In the panic of 1873, for example, the failure of Jay Cooke's giant investment house helped trigger a worldwide crisis. In the Great Depression it was the sudden implosion of Austria's biggest bank, Credit-Anstalt. Many of the world's most powerful and important banks had lent money to it, and its failure triggered other bank failures around the globe.

In the intervening decades, financial markets became even more integrated and interdependent. Indeed, in the recent crisis, the complex webs of borrowing and lending that bound together the international financial system were almost impossible to fully understand, much less disentangle. In fact, few people likely understood that stress in the repo or commercial paper market in one country could be quickly transmitted elsewhere. While there had been some crises that crossed national borders, none came close to rivaling the Great Depression; understanding of how the global financial system could—and would—unravel was limited.

That ignorance ended after the collapse of Lehman Brothers on September 15, 2008. When it failed, the hundreds of billions of dollars in short-term debt it had issued—most of it commercial paper and other bond debt—became worthless, triggering panic among the various investors and funds that held it. This panic prompted a run on the money market funds that provided lending to the commercial paper market and sowed further panic throughout the global banking system. Banks that had made short-term loans to foreign banks jacked up their rates by over 400 basis points, an astronomical increase. What overseas investors called the "Lehman Shock" spread fear throughout global money markets, curtailing lending and eventually crippling global trade.

While the failure of Lehman Brothers helped transmit the crisis throughout the world's financial system, it was hardly the only catalyst. A classic mechanism for spreading crises is the otherwise unremarkable fact that investors in multiple countries hold identical assets. In a number of nineteenth-century crises, for example, investors around the world held the same types of railroad securities, a popular international investment. When the bubble behind these securities popped, investors in the United States, Britain, France, and elsewhere simultaneously saw their portfolios go up in smoke. Invariably, they curtailed credit, hoarded cash, and triggered a panic.

The recent crisis was comparable. The subprime meltdown spilled over from the United States to Europe, Australia, and other parts of the world for the simple reason that about half of the securitized sausage made on Wall Street—the collateralized debt obligations and the mortgage-backed securities from which they derived their value—were sold to foreign investors. During the housing boom, foreign banks, pension funds, and a host of other institutions had snapped up these securities. When a subprime borrower in Las Vegas or Cleveland defaulted on his mortgage, it rippled up the securitization food chain, hitting everyone from Norwegian pensioners to investment banks in New Zealand.

Perhaps the largest portion of these securities ended up in the asset portfolios of European banks and their subsidiaries. Some banks had direct exposure to the subprime crisis, holding tranches of CDOs and other instruments as ordinary assets. In other instances, most notably with BNP Paribas and UBS, hedge funds attached to these banks functioned as disease vectors, placing high-risk bets on a range of subprime securities. When those investments soured, the resulting losses ultimately hit the banks' bottom lines.

The losses sustained by these banks caused considerable collateral damage to the corporate sector in Europe. Unlike American firms, which rely more on capital markets for their financing, European firms depend heavily on bank financing. When the subprime crisis started to hammer reputable European banks, they curtailed lending, limiting the corporate sector's ability to produce, hire, and invest. This set the stage for the recession that gripped the region in the final months of the crisis.

The damage did not stop there. Many of these same European banks had subsidiaries in other countries, particularly in emerging Europe—the countries that had been freed of Soviet control after the end of the Cold War. These subsidiaries had pumped significant amounts of credit into Ukraine, Hungary, Latvia, and other countries. Once the parent banks suffered massive

losses, they became risk averse and withdrew credit across the board, starving their foreign subsidiaries. The resulting collapse of credit in emerging Europe helped plunge these countries into recession.

In this way, the subprime problem in the United States rippled outward via financial ties. It first affected countries that did plenty of banking business with the United States, then radiated from there to financial institutions in countries on the periphery of the global economy. It was a classic case of contagion, in which the banking system served as the conduit for America's subprime ills.

But banks weren't the only parts of the financial system to sow crisis around the world. Stock markets played an important role as well. At dramatic turning points in the crisis, the American stock market plunged, followed by precipitous drops on exchanges in London, Paris, Frankfurt, Shanghai, and Tokyo, and in smaller financial centers. This spread was partly a function of the remarkable degree of interdependence between international stock markets. In a world in which traders can instantaneously track movements in markets halfway across the globe, investor sentiment can easily spill over from one exchange to another.

Nonetheless, this growing synchronization was not merely a classic case of herd behavior, in which spooked investors in one country's exchange sent investors elsewhere over the cliff. As the portents of disaster accumulated, the stock market became the medium through which investors registered their growing aversion to risk, by dumping equities for less risky assets.

The contagion that raced through the stock markets may have been more pervasive, faster, and more synchronized than in any previous disaster. But it was merely the latest, most sophisticated version of a dynamic that has existed for well over a hundred years. Financial globalization, in other words, is nothing new. In 1875 the banker Baron Karl Mayer von Rothschild, upon observing that global stock markets had plunged in unison, made a simple but timeless observation: "The whole world has become a city."

Integration in Rothschild's day went beyond the stock markets: global trade too was extraordinarily interdependent and sensitive to financial crises. Sadly, little changed in the intervening years. After panic seized the financial system in 2008, international trade helped spread the crisis around the world.

Disease Vectors

In the nineteenth century the British Empire was the reigning economic superpower, and whenever it spiraled into a financial crisis, its trading partners suffered collateral damage, as demand for raw materials and finished goods plummeted. In the twentieth century the United States inherited Britain's mantle, accounting on the eve of the crisis for about a quarter of the world's gross domestic product. Thanks to its $700 billion current account deficit, its real share of the world economy was even bigger. When it slipped into a severe recession, the effects echoed around the world, in countries as various as Mexico, Canada, China, Japan, South Korea, Singapore, Malaysia, Thailand, and the Philippines. China was particularly at risk, as much of its recent growth had depended on exports to the United States. Thousands of Chinese factories shuttered, and employees returned from urban to rural areas, casualties of a collapse half a world away.

The effects of the downturn in China were not limited to trading links. Many Asian countries produced computer chips and exported them to China, where they would be assembled into computers, consumer electronics, and other items, to be shipped to the United States. When the crisis hit the United States, it hit not just China but all the countries that China used in its supply chains. Here decoupling was next to impossible: economies throughout Asia depended heavily on a wide range of direct and indirect trading ties to the United States.

Decoupling was particularly difficult to avoid once Lehman Brothers collapsed; the usually boring world of trade financing was one of the first casualties. Normally banks issue "letters of credit" to guarantee that goods in transit from, say, China to the United States will be paid for when they reach their final destination. Once the credit markets seized up after Lehman's failure, however, banks stopped providing this essential financing. Global trade came close to a standstill; formerly obscure benchmarks like the Baltic Dry Index—a measure of the cost of shipping commodities—plummeted by almost 90 percent. As one expert on global shipping observed shortly after Lehman's collapse, "There's all kinds of stuff stacked up on docks right now that can't be shipped because people can't get letters of credit."

The collapse of global trade that began with the U.S. recession and intensified with the demise of Lehman Brothers was unprecedented: only the Great Depression can compare. At the peak of the crisis in early 2009, exports fell—on a year-over-year basis—by 30 percent in China and Germany, and by 37 or even 45 percent in Singapore and Japan. All these countries save China slipped into a severe recession, and even China saw a dramatic collapse in its annual economic growth from 13 percent to approximately 7 percent, below the threshold of what's considered sustainable in that country.

All this happened with a speed and simultaneity that shocked most market watchers. "The Great Synchronization," as two economists with the Organisation for Economic Co-operation and Development dubbed the international trade collapse, was clearly a function of the global credit crunch, but that alone doesn't explain what happened. As the crisis worsened, despite pledges to the contrary, many nations adopted tariffs, quotas, and other barriers to international trade—legislation forcing government contractors to buy from domestic manufacturers, for example. Such tit-for-tat trade wars had proved inimical to global trade and growth in the depths of the Great Depression, and their recent recurrence, while less pronounced, did not help global trade recover.

Finally, the crisis spread along paths taken not only by goods but by people too. As the United States plunged into recession, migrant workers stopped sending money back to their home countries: Mexico, Nicaragua, Guatemala, Colombia, Pakistan, Egypt, and the Philippines, to name a few. Many of these migrant workers had gained regular work during the housing booms, not only in the United States, but in Spain and Dubai, and when these booms became busts, remittances back home collapsed too. The effect of this drop-off in remittances is hard to overstate. In some Central American countries, more than 10 percent of the national income comes from citizens who work abroad. In this way, the crisis hurt countries that had never participated in reckless financial practices.

While trade and labor ties have often enabled crises to jump national boundaries, commodities and currencies have played an even bigger role. The reason is simple enough: the prices of commodities and currencies are set in world markets. When the price of oil or copper or a dollar rises in one place, it rises everywhere; when it declines, it declines everywhere. For that

reason, sudden fluctuations in the prices of commodities and currencies can fuel instability on a global scale.

This level of integration dates back at least two centuries. When the price of cotton in New Orleans rose to bubblelike heights in 1836 and then crashed with the panic of 1837, the pain was felt not only domestically but in cotton-exporting nations around the world. Likewise, when a range of commodity prices fell by as much as 50 percent in the year following the crash of 1929, export-driven economies suffered terribly. As prices fell for everything from coffee to cotton to rubber to silk, the economies of Brazil, Colombia, the Dutch East Indies, Argentina, and Australia were distressed. Even Japan suffered, as a disintegration of demand for raw silk crippled its economy. These countries saw their finances imperiled and their currencies depreciated on account of falling commodities prices.

Commodities prices played a role in the recent crisis too, though in ways that challenge the usual boom-to-bust narrative. Throughout 2007 and 2008 the prices of oil, food, and other commodities rocketed upward. In the summer of 2008 oil prices peaked at around $145 a barrel, up from $80 a year earlier. The increase wasn't remotely justified by economic fundamentals; rather, it was a function of investment or speculation driven by hedge funds, endowment funds, broker dealers, and various commodities funds that had invested some of their portfolios in commodities. While the oil price spike may have benefited the oil exporters, it hit all the oil importers hard: the United States, the Eurozone, Japan, China, India, and others. Several of these countries were already reeling from the effects of the financial crisis; the oil shock probably pushed them into a full-blown recession.

What was true on the way up was true on the way down. Exporters of oil and other commodities who had remained insulated from the financial crisis in 2007–8 struggled when demand from the United States and China collapsed. In the second half of 2008, demand for oil, energy, food, and minerals fell even further, and the effect was comparable to what happened in the Great Depression: commodity exporters in Africa, Asia, and Latin America saw their economies tumble. Oil producers were particularly hard hit: the price of oil fell from its peak to a low of $30 in the first quarter of 2009. But the damage extended to a range of raw materials. In Chile, for example, the collapse of demand for copper hammered that country's export-driven

economy, propelling it into a recession. In all of these disruptions, a commodity boom initially helped trigger a global recession among commodity-importing nations; the consequent commodity bust pummeled the exporters.

Fluctuations in currencies displayed a similar dynamic and proved equally disruptive. In 2007, during the opening innings of the crisis, the American economic slowdown and the ensuing reduction in interest rates helped undermine the value of the dollar. This devaluing hit countries that relied on exports to the United States: the United Kingdom, Japan, and many nations in the Eurozone. As their respective currencies strengthened relative to the dollar, the cost of these goods to American consumers rose. This undercut the competitive edge of these countries, setting them up for a recession.

As the crisis worsened, however, the process went abruptly into reverse. The fear and panic that seized the financial markets over the course of 2008 drove international investors to seek safe havens. One of them was, somewhat paradoxically, the dollar. Even though the United States was at the epicenter of the crisis, it seemed a safer bet than any number of emerging economies. As investors piled into dollars, along with the currencies of other developed countries, they simultaneously dumped the stocks and bonds in various emerging markets, further widening the gap between those countries' currencies and the "safer" currencies of the developed nations.

The effects were calamitous. Before the crisis, households and firms in emerging Europe had obtained mortgages and corporate loans from banks in more established countries. They had turned to those banks because the interest rates on euros, Swiss francs, and even Japanese yen were lower than the rates available in their own countries. Firms in Russia, Korea, and Mexico used the same borrowing strategy. But when the crisis hit and investors fled from emerging-market currencies to safe havens like the dollar, the euro, and the yen, the cost of servicing those debts went through the roof, putting enormous strains on the emerging-market economies.

All of this followed a pattern established by crises past. Like the international financial system, and like the global trading links, commodities and currencies served as pathways, enabling one nation's financial crisis to become an economic crisis of global proportions.

That said, there are limits to what the contagion model can explain.

Implicit within it is the idea that a sick country—the United States—gave the rest of the world one hell of a cold. That's a comforting thought, but it's partly wrong. Plenty of other countries hatched their own bubbles independently of the United States and pursued policies no less reckless or foolish. They had little immunity to the subprime sickness because they too had made themselves highly vulnerable to the disease.

Shared Excesses

In 1837 Martin Van Buren, who was just ascending to the U.S. presidency, tried to explain why "two nations"—the United States and Britain—"the most commercial in the world, enjoying but recently the highest degree of apparent prosperity . . . are suddenly . . . plunged into embarrassment and distress." He was referring to the horrific panic of 1837, which was well under way, and while many commentators blamed either the United States or Britain for triggering the disaster, Van Buren recognized that the truth was more complicated. "In both countries," he wrote, "we have witnessed the same redundancy of paper money and other facilities of credit; the same spirit of speculation; the same partial successes; the same difficulties and reverses; and at length nearly the same overwhelming catastrophe."

Van Buren's assessment was not far from the mark. While the United States was arguably the worst offender in its unbridled enthusiasm for high-risk banking and real estate speculation during the 1830s, the British independently engaged in a mania for chartering banks and created a comparable bubble, complete with a "reckless extension of credit and wild speculation" in textiles and railroads. When the American economy started to shake and fall, the British economy did as well. Not only was it inextricably intertwined with the American economy, but it suffered from many of the same vulnerabilities that had accumulated during the boom years. The crisis did not emanate from a sick country to a healthy one; it struck two nations at nearly the same time.

This same pattern can be glimpsed in other crises. When one country's boom goes bust, other countries that have racked up the same kind of

excesses tend to collapse as well. In 1720, for example, the British South Sea Bubble imploded around the same time that John Law's speculative Mississippi Company foundered. A century and a half later, the crisis of 1873 came on the heels of simultaneous booms in Germany, Central Europe, and the United States. These turned to brutal busts, first in Austria-Hungary, then in the United States, and then throughout much of the rest of Europe. A little over a century later speculative booms in emerging economies throughout Asia that had been fueled with foreign investment went bad in quick succession, hammering South Korea, Thailand, Indonesia, and Malaysia. Again, this was a matter of shared vulnerabilities as much as simple contagion.

Many of the economies that collapsed in the recent crisis, not surprisingly, had similar vulnerabilities as the United States. The United States was hardly the only country, for one thing, with a housing bubble. Dubai, Australia, Ireland, New Zealand, Spain, Iceland, Vietnam, Estonia, Lithuania, Thailand, China, Latvia, South Africa, and Singapore all had recently seen housing values appreciate at relentless rates. In 2005 *The Economist* calculated that the total value of the residential properties in the world's developed economies had effectively doubled from 2000 to 2005. This gain, a stunning $40 trillion, was equivalent to the combined gross domestic products of *all* the countries in question. "It looks like the biggest bubble in history," the magazine observed.

Some of these increases were staggering. While *The Economist* noted that American home prices appreciated by 73 percent between 1997 and 2005, Australian prices rose 114 percent, and Spanish prices by 145 percent. In Dubai, locale of a massive real estate bubble, prices of villas rose a staggering 226 percent between 2003 and 2007 alone, according to real estate consultants Colliers International. Figures on housing price appreciation in Asia and Eastern Europe are less dependable, but anecdotal evidence suggests that these regions enjoyed comparable booms. The United States was bad, but it was hardly the worst offender, even if it may have generated more problem loans than any other country.

Whatever the rate of appreciation, the reasons for the boom were invariably the same. Most of these countries had pursued easy monetary policies, so that borrowing costs hit historic lows, a trend only reinforced by a global

savings glut. By 2006, mortgage rates in every developed and developi economy had declined to single digits for the first time ever. And like t United States, most countries did little to regulate their mortgage and fina cial markets. The result was the same: as home prices went up, househol in these countries felt wealthier; they spent more and saved less. The ensui boom in residential investment boosted many of these countries' GDP.

But this masked a deeper problem, much as it did in the United State Low savings and high investment rates implied that the current accou balance—the difference between a country's total savings and its tot investments—was veering into negative territory. Unlike countries that ru a current account surplus, countries that run a deficit need savings fro other countries to underwrite their investments. The latter was the situatic with the United States and other countries with housing bubbles: they h grown increasingly dependent on foreign capital to bring their accounts in balance. This in turn led to inflated currencies and caused a further deteri ration in these countries' current account balance.

When the housing bust hit the United States, all the other economi with housing bubbles underwent comparable, if not greater, declines. Co trary to conventional wisdom, their housing busts were not a direct cons quence of the American subprime crisis. The American crash may have bee the catalyst, but it was not the cause: most if not all of these countries wit overheated housing markets were poised for crashes as well. All they neede was a push, which they got when the global economy plunged into a cris and a widespread recession in 2008.

If the United States had company in hatching an enormous housin bubble, it had peers in other areas as well. Take, for example, the problem leverage and risk taking. While American financial institutions were reckles their counterparts around the world were no less guilty. For example, by Jun 2008, leverage ratios at European banks had hit new highs. Venerable Credi Suisse had levered up 33 to 1, while ING hit 49 to 1. Deutsche Bank was u to its eyeballs in debt at 53 to 1, and Barclay's was the most levered of all, a 61 to 1. By comparison, doomed Lehman Brothers was levered at a relativel modest 31 to 1, and Bank of America was even lower, at 11 to 1.

Many European banks had avidly joined in the frenzy of financing an

securitizing mortgages and other kinds of loans. This left them holding toxic mortgage-backed securities and CDOs that eroded in value when the housing crisis hit the United States. As markets for these securities dried up, many European banks saw their potential losses rise to frightening levels. By the end of 2009, the European Central Bank raised estimates of write-downs to €550 billion, topping earlier estimates.

Not all these assets came from the United States. Many banks in Europe engaged in their own securitization party, slicing and dicing mortgages from homeowners in European countries, with Britain, Spain, and the Netherlands providing most of the loans. In 2007 alone, €496.7 billion worth of European loans became the basis of asset-backed securities, mortgage-backed securities, and CDOs. While the excesses of this market paled in comparison to those of the United States, standards remained lax. Even worse, many of the loans and securities that banks had in the securitization pipeline were parked in conduits and SIVs. When the crisis hit, banks had to bring them back onto their balance sheets, much as their American counterparts did.

Finally, many European banks made high-risk loans in emerging Europe, particularly Latvia, Hungary, Ukraine, and Bulgaria. When the crisis hit, many of these economies saw their currencies fall sharply, and partly as a result, they could no longer make good on their loans. Suddenly European banks—especially those in Austria, Italy, Belgium, Sweden, and Germany—found themselves taking massive losses on their loan portfolios. As one Danish analyst observed in early 2009, "the markets have decided that the [emerging] region is the subprime area of Europe and now everyone is running for the door." It wasn't the same subprime crisis that hit the United States, but it stemmed from the same underlying problem: too many high-risk loans.

Hence the United States was hardly the only developed economy to fall during the crisis. Indeed, many European institutions got into trouble in advance of their American counterparts. The French bank BNP Paribas was one of the first, suspending several hedge funds in the summer of 2007. The German bank IKB imploded at the same time, a victim of runs on its SIVs; another German bank, Sachsen LB, was bailed out later that summer. This was but the beginning: Iceland's entire banking system would eventually collapse, and most banks in the United Kingdom ended up nationalized.

Similar problems eventually surfaced in Ireland, Spain, and a host of other European nations. And the bust of the real estate bubble in Dubai eventually led Dubai World, the government-owned enterprise most involved in these risky real estate developments, to seek a bailout from Abu Dhabi in December 2009.

Throughout it all, the crisis was following a familiar path. Many economies, particularly those in Western Europe, could not avoid the crisis because they suffered from many of the same vulnerabilities: housing bubbles, an overreliance on easy money and leverage, and an enthusiastic embrace of high-risk assets and financial innovation.

This fact highlights a broader truth about crisis economics: similar crises emerge in different places with seeming synchronization because of shared weaknesses. Too often market watchers refer to financial crises as "pandemics" or some other disease metaphor without acknowledging an important underlying truth: disease spreads most readily and quickly among those who are weak and lack immunity. In the recent crisis, many economies in Europe shared the same vulnerabilities as the U.S. economy. It's no surprise, then, that when the United States sneezed, they caught the cold—or perhaps more accurately, the flu.

But not everyone got sick, and that too is revealing. Look, for example, at India's experience. Though buffeted by the meltdown, its economy proved remarkably resilient. In the years leading up to the crisis, its conservative central bankers had gone down a different road than most of the world. Indian policy makers had resisted attempts to deregulate the financial system, and banks were forced to maintain hefty reserves. Where other countries embraced the mantra of free markets, India kept a tight lid on its financial system. As a consequence, it was relatively immune to the "disease" emanating from the United States.

Sadly, the same cannot be said for the world's other emerging economies, many of which —particuarly those in Central and Eastern Europe—followed a familiar boom-to-bust trajectory. Still, their fate was not purely a function of shared vulnerabilities; rather, the peculiar way that developed and less developed economies can become entangled in a mutually destructive relationship contributed to their fate.

Emerging Economies, Existing Problems

Emerging economies usually depend on capital from more developed nations. That dependency, though mutually beneficial to both parties when times are good, can end up looking like a suicide pact when things fall apart. In the crisis of 1825, British investors flooded into the newly independent nation of Mexico as well as several other Latin American states recently freed from Spanish control. In the first year of independence alone, some £150 million worth of funds flowed into the region, with much of the mania focused on gold and silver mining. As investors poured into these countries, the new nations flourished. So too did speculators back in London, as investors bid up the prices of the new nations' mining stocks and bonds. Unfortunately, many of the ventures proved to be failures or even outright frauds, and the market collapsed. Investors fled stocks and pulled their funds out of Peru, Colombia, and Chile. The Latin American nations proved unable to service their debt, and in 1826 Peru defaulted, causing what one observed called "considerable panic" in the City of London. The other countries soon followed.

In the nineteenth century the most crisis-prone of the emerging markets was none other than the United States. European investors, in particular the British, plowed enormous amounts of capital into the country, snapping up the bonds of state governments, canal and railroad securities, and a host of other assets. The influx of funds helped underwrite booms in the United States, as well as speculative bubbles back in Europe. Most of them eventually collapsed, and when they did, foreign investors abruptly divested themselves of "risky" American assets.

In every case the result was predictable: booms turned to busts on both sides of the Atlantic. Many of the American banks and businesses that had benefited from the surfeit of foreign capital collapsed; many of their counterparts in Europe suffered too. In the wake of the panic of 1837, foreign investors fled en masse. Hundreds of banks perished in the United States, and a quarter of the individual states defaulted on some portion of the debt they had issued; panic simultaneously seized the City of London. A similar flight took place in 1857, after which one commentator claimed—with

some exaggeration—that the "distrust felt by nearly all foreigners in the future of the United States was so great that the larger portion of American securities . . . held in foreign countries, were returned for sale at almost any sacrifice." History repeated itself yet again in 1873, as the railroad boom collapsed, prompting European investors to run for the exits once more.

Other emerging markets have suffered similar fates. In the 1990s a new generation of emerging markets around the world were shaken by a series of crises: Mexico in 1994; South Korea, Thailand, Indonesia, and Malaysia in 1997; Russia, Brazil, Ecuador, Pakistan, and Ukraine in 1998 and 1999; Turkey and Argentina in 2001. After flooding these countries with capital, foreign investors got spooked and fled in droves, leaving behind currency crises, waves of failures in the banking and corporate sectors, and defaults on government debt. Only the timely intervention of the IMF and the world's central banks prevented a worldwide economic disaster.

Emerging-market crises also played a role in the recent crisis, though in a more muted and complicated way. The ones that conformed to the previous pattern included the economies of emerging Europe. Like their predecessors, they generally had one thing in common: large current account deficits. Sometimes these deficits were fueled by a housing boom and huge increases in consumer spending, along with a drop in private savings; other times it was a function of government deficits or even corporate borrowing. Whatever the reason for the deficits, these countries borrowed extensively from investors and banks in more developed nations. They borrowed an enormous amount: between 2002 and 2006, borrowing from foreign sources increased by 60 percent every year. Even worse, much of their debt was denominated in foreign currencies, a strategy that went awry when their own domestic currencies started to depreciate during the crisis.

Though the crisis hit countries as different as Romania, Bulgaria, Croatia, and Russia, it was the Baltic states—Latvia, Estonia, and Lithuania—as well as Hungary and Ukraine that suffered the most. All of them saw an abrupt reversal of capital flows, as skittish investors fled "risky" markets—in other words, emerging economies—and headed for safer havens. The results were predictable, if brutal. Hungary, Iceland, Belarus, Ukraine, and Latvia all went hat in hand to the IMF, begging for a bailout. All three Baltic countries saw spectacular rises in unemployment; all three saw their banking sectors edge toward a crisis. The

Baltics suffered the worst consequences, registering double-digit unemployment by the spring of 2009. Latvia, arguably the hardest hit of all, suffered riots, the downfall of the government, and the collapse of its credit rating.

These countries fit the classic pattern of emerging economies that boom with an influx of foreign capital, then collapse when investors head for the exits. But another group of emerging economies that were hammered in the bust did not fit the usual profile: they enjoyed current account surpluses. China was the most prominent member of this group, but Brazil and smaller countries in the Middle East, Asia, and Latin America fell into this category too.

Most countries with current account surpluses tend to see their currencies appreciate. But in the years leading up to the crisis, the governments in these countries intervened aggressively in the foreign exchange markets in order to keep their currencies undervalued. They did so because many of them depended on exports, and the cheaper their currencies remained, the more effectively they could compete in world markets. This kind of intervention helped underwrite exports, but it meant an accumulation of dollars and other currencies at home, fueling a growth in the money supply.

The abundance of easy money and low interest rates then contributed to inflation and to asset bubbles, particularly on domestic stock exchanges. At their peak, stocks in China and India hit price-to-equity ratios of 40 or even 50 late in 2007—definite bubble territory. Many of these economies overheated in advance of the American financial meltdown, making them extraordinarily fragile and susceptible to sudden shocks. To a certain degree, their vulnerabilities had evolved independently of the excesses in the United States. Their eventual downfall had little direct relationship to the American crisis; rather, it was a consequence of policies pursued in the years before the bust. They ended up casualties of the crisis, but to a remarkable extent, they were the architects of their own misfortune.

The Death of Decoupling

As the crisis gathered steam in early 2008, most policy makers outside the United States, despite all the historical and contemporary evidence suggesting

that a global pandemic was imminent, dithered. Still smitten with the idea of decoupling, many worried that their economies might overheat, generating inflation. Then central bankers in a number of emerging economies raised interest rates in an attempt to tighten monetary policy. Their counterparts in the more advanced economies followed suit; and in mid-2008 the European Central Bank implemented an ill-fated and misguided increase in policy rates.

To make matters worse, European policy makers refused to adopt an aggressive stimulus policy. The European economies that could most readily afford such a program (Germany in particular) did relatively little initially, and those who needed it the most (Spain, Portugal, Italy, and Greece) lacked the money to implement one. These "Club Med" countries were already running big budget deficits and carried a large stock of public debt relative to the size of their economy; they had little room to maneuver.

These decisions ill prepared policy makers in both advanced and emerging economies to combat the effects of the unfolding crisis. It caught them by surprise, and thanks in no small part to their flawed analysis, the global economy sank into the worst recession since the 1930s. In the fourth quarter of 2008 and the first quarter of 2009, the global economy contracted at a rate that paralleled, in size and in depth, the collapse from 1929 to 1931 that began the Great Depression.

As for decoupling, the rest of the world actually suffered more than the United States that winter. While the U.S. economy contracted during those two quarters at an annual rate of 6 percent, the contraction elsewhere was far more brutal. Economies that were supposed to decouple did not; they "recoupled" with a vengeance. Japan, which many initially hailed as immune to the crisis, saw its economy contract at an annualized rate of 12.7 percent in the final quarter of 2008; South Korea saw an even bigger decline of 13.2 percent. China managed to avoid an outright recession, even if its growth dropped below sustainable levels. Most of the rest of the world was not so lucky. In the finger-pointing that followed, many market watchers focused on the collapse of Lehman Brothers, seeing in that catastrophe the cause of all the world's ills. Even now some consider this event the catalyst for the crisis.

This interpretation is comforting but wrong. By the time of Lehman's

collapse in September 2008, the United States had been in a recession for ten months, and much of the rest of the world was already in the same boat. The global credit crunch had been in full swing for over a year, and global equity markets had been headed south for nearly the same length of time. The crisis in the United States, which had started a year and a half before Lehman's collapse, had already radiated to the rest of the world along a host of channels: the financial system, trade relations, commodities, and currencies.

It did not infect these other countries by accident. For years, many of them had played host to housing and equity bubbles, credit bubbles, and excessive leverage, risk taking, and overspending. Their vulnerabilities had been building for years, and even countries that had taken a more prudent course—China and much of the rest of Asia—depended far too much on exports for their continued survival. They too were vulnerable, if in a different way: their continued prosperity depended on bubbles halfway around the world, bubbles that had already popped in advance of Lehman's collapse.

But the collapse of that famous firm did more than anything else to focus the minds of policy makers on the reality that the risk of another Great Depression loomed. At the end of 2008 they looked into the abyss and got religion. They started deploying all the weapons in their arsenal. Some tactics, like cutting interest rates, came from the standard playbook. But many others seemed to come from another world, and in some cases another era. To the uninitiated, the names of these tactics—"quantitative easing," "capital injections," "central bank swap lines"—defy definition. But these and many other unorthodox weapons came off the shelf and were mustered into battle. Some had been tried before; others had not. Some worked; some did not.

Nonetheless, their collective effect arguably prevented the Great Recession from turning into another Great Depression. Whether the cure will turn out to be worse than the disease is another matter, and it is to that question—and the risks and rewards of using unconventional policy measures to deal with financial crises—that we turn next.

Chapter 6

The Last Resort

When the worst financial crisis in generations hit the United States in 2007, Ben Bernanke had just been appointed head of the Federal Reserve a year earlier. It was a remarkable coincidence, for Bernanke was not just any central banker; he was one of the world's leading authorities on the Great Depression. Far more than almost any living economist, Bernanke was acutely aware of the complicated dynamics behind this watershed event. Over the course of his academic career, he had written influential articles that helped untangle the causes and effects of the worst depression in the nation's history.

Bernanke self-consciously built on the pioneering work of monetarists Milton Friedman and Anna Jacobson Schwartz, whose writings he first encountered in grad school. As we saw in chapter 2, these two scholars had broken with earlier interpretations of the Great Depression by arguing that monetary policy—courtesy of the Federal Reserve—was to blame for the disaster. According to this interpretation, the Fed's inaction and ineptitude not only failed to prevent the unfolding disaster but even contributed to the problem. Bernanke elaborated on that thesis, showing how the consequent

collapse of the financial system threw sand in the gears of the larger economy, dragging the nation into a brutal depression.

Bernanke's keen appreciation of the burdens of history and his debt to Friedman were evident when he attended the venerable economist's ninetieth birthday party in 2002. By then Bernanke was a governor on the board of the Federal Reserve, and when he stood up to give a speech, he famously turned to the elderly man and said, with regard to the Great Depression: "You're right, we did it. We're very sorry. But thanks to you, we won't do it again."

This was the man in charge of monetary policy when the crisis hit. Not surprisingly, he saw events through the prism of what had happened nearly eighty years earlier and acted accordingly. Rules would be broken, and new tools tried. There would be no repeat of the Great Depression. As he told a reporter in the summer of 2009, "I was not going to be the Federal Reserve chairman who presided over the second Great Depression."

To that end, Bernanke revolutionized monetary policy, directing a stunning series of interventions into the financial system that even today few people understand. Some of these moves Bernanke had anticipated making; others he developed as the months passed and the threat of deflation and even a depression increased. They ran the gamut from conventional monetary policy—slashing interest rates to zero, for example—to unprecedented measures heralding a massive expansion of the Federal Reserve's power over the economy.

These interventions probably did help avert a twenty-first-century Great Depression, but for the student of crisis economics they raise a host of unsettling issues. Aside from the difficulty of scaling back Bernanke's policies once they're in place, many of them may prove conducive to moral hazard on a grand scale. The Fed, in its rush to prop up the financial system, rescued both illiquid and insolvent financial institutions. That precedent may be hard to undo and, over the long run, may lead to a collapse of market discipline, which in turn may sow the seeds of bigger bubbles and even more destructive crises.

No less problematic is the fact that some of Bernanke's monetary policies infringe on the traditional fiscal powers of elected government—namely, the power to spend money. In the recent crisis, the Fed pushed the statutory envelope, assuming various powers, implied and otherwise, to swap safe

government bonds for toxic assets and, more radical, to purchase toxic assets and hold them on its balance sheet. Such measures, even if they prove effective, amount to an end run around the legislative process.

Bernanke's response, orchestrated by himself and other central bankers, offers a glimpse of the unorthodox ways in which monetary policy can be used—and perhaps abused—to prevent a crisis from spiraling out of control.

Deflation and Its Discontents

Since the end of the Second World War, the American business cycle has followed a fairly predictable path. The economy would emerge from a recession, grow, and eventually boom; the Federal Reserve would then begin to bring the cycle to a close by hiking interest rates to keep inflation in check, and more broadly, to keep the economy from overheating. Inevitably, the economy would contract; a recession would ensue.

In some cases, most notably in 1973, 1979, and 1990, the recession was set off in part by what economists call an exogenous negative supply-side shock. All three times, a geopolitical crisis in the Middle East triggered a sudden rise in oil prices that sparked inflation. Here too, to control rising prices, the Fed moved interest rates higher, after which the economy started to contract.

Whatever their causes, these various contractions would inevitably moderate inflation, without eliminating it altogether. The fall in output or the gross domestic product—typically a single percentage point or two—led to unpleasant but tolerable increases in unemployment and the familiar hardships of a recession.

In some instances, the economy would grow again of its own accord; in others, policy makers facilitated a recovery by resorting to a time-honored tool: they would cut interest rates, effectively making it cheaper for households and firms to borrow money. This would nudge people to spend more, driving up demand for everything from houses to factory equipment. Cutting interest rates often had the added effect of driving down the value of

the dollar, making exports more attractive, making imports more expensive, generating demand for domestic goods, and contributing to an eventual recovery. Fiscal stimulus was also used to restore growth.

The first ten recessions in the postwar United States largely followed this script. Most lasted less than a year, save for a nasty recession in the wake of the oil shock of 1973, which was triggered by the Yom Kippur War; and after a second oil shock in 1979 caused by the Iranian Islamic Revolution, the Federal Reserve used high interest rates to slay inflation, resulting in a far more unpleasant recession. While brutal, that campaign proved successful and set the stage for the much-celebrated Great Moderation. As a consequence, recessions in 1991 and 2001 lasted a mere eight months each, and while these downturns brought pain aplenty, they ended with renewed growth and optimism, thanks in part to varying doses of monetary easing, fiscal stimulus, and tax cuts.

The twelfth postwar recession, which took hold in the wake of the recent financial crisis, has been different. Prices not only moderated but in some cases registered declines for the first time in fifty or sixty years. This was deflation, a phenomenon that unnerved policy makers across the ideological spectrum. Its recurrence "gives economists chills," reported *The New York Times* in the fall of 2008. The following spring Bernanke explained, "We are currently being very aggressive because we are trying to avoid . . . deflation."

To the uninitiated, the fuss seemed a bit mystifying. After all, aren't falling prices a good thing? Consumer goods cost less; people can buy more with every dollar they own; what's not to like? In fact, in a handful of episodes small, steady rates of deflation have gone hand in hand with robust economic growth, as technological advances drove down the price of goods. Between 1869 and 1896, for example, the spread of railroads and new manufacturing techniques helped push down prices by some 2.9 percent a year. At the same time, despite recurrent crises, the economy grew at an average annual rate of 4.6 percent.

This episode remains something of a curiosity for economic historians because deflation is generally not compatible with economic growth. Why? In most cases, deflation isn't caused by a technological revolution; it's caused by a sharp fall of aggregate demand relative to the supply of goods and the productive capacity of the economy.

This more common kind of deflation can have all sorts of peculiar effects on the day-to-day functioning of the economy. It can deter consumers from spending on big-ticket items: buying a car or a house, for example, becomes a bit like catching a falling knife. Similarly, a factory contemplating some capital investments may prefer to remain on the sidelines until prices stop falling. Unfortunately, postponing spending, far from stimulating economic growth, does precisely the opposite.

A bout of deflation born of a financial crisis is of a different order altogether and may be far more dangerous and destructive. Such bouts were relatively common in the wake of the perennial crises of the nineteenth century, then became much rarer in the twentieth. While deflation accompanied the global depression of the 1930s, it largely disappeared after that watershed event. Only in the 1990s did it resurface, first after the collapse of Japan's asset bubble, and then during the brutal recession that hit Argentina in 1998–2001.

During the recent crisis, the prospect of this kind of deflation was what gave economists the chills. They knew well that its ill effects could ramify throughout the economy. Even if it doesn't end in an outright depression, deflation can suffocate growth for years, leading to a condition that might best be described as stag-deflation, in which economic stagnation and even recession are combined with deflation. In such a condition, the usual tools of monetary policy cease to have much effect.

Irving Fisher was one of the first economists to understand the dynamics of deflation. While Fisher remains infamous today for claiming, shortly before the market crashed in 1929, that stock prices would remain on a "permanently high plateau," he redeemed himself by subsequently articulating a compelling theory of the connection between financial crises, deflation, and depression, or what he called the "debt-deflation theory of great depressions." Put simply, Fisher believed that depressions became great because of two factors: too much debt in advance of a crisis, and too much deflation in its wake.

Fisher began by observing that some of the worst crises in American history—1837, 1857, 1893, and 1929—followed on the heels of an excessive accumulation of debt throughout the economy. When the shock came—the stock market crash of 1929, for example—margin calls led to frenzied attempts to pay down debt. Fisher believed that this rush to liquidate debt and stockpile liquid reserves, while rational, damaged the health of the

larger economy. As he explained in 1933, "The very effort of individuals to lessen their burden of debts increases it, because of the mass effect of the stampede to liquidate . . . the more debtors pay, the more they owe." Fisher famously noted that from October 1929 to March 1933, while debtors frantically reduced the nominal value of their debt by 20 percent, deflation actually increased their remaining debt burden by 40 percent.

Why? The rush to liquidate assets at fire-sale prices, Fisher argued, would lead to falling prices for everything from securities to commodities. Supply would far outstrip demand, and prices would fall. At the same time, people would tap money deposited in banks in order to liquidate debts or as a precaution against bank failures. These withdrawals would lead to a reduction of what economists call "deposit currency" and, by extension, a contraction of the overall money supply. This contraction would depress prices still further. As prices continued to fall, the value of assets across the board would drift downward, triggering a commensurate decline in the net worth of banks and businesses holding those assets. More fire sales and more deflation would result, leading to less liquidity in the markets, more gloom and pessimism, more hoarding of cash, and more fire sales.

The resulting deflation would have perverse consequences. As borrowers moved to pay off their debts (and as aggregate demand for goods started to fall in a severe recession), the lowered prices of goods and services would paradoxically increase the purchasing power of the dollar, and by extension, the real burden of their remaining debt. In other words, deflation increases the real value of nominal debts. Instead of getting ahead of their debts, people fell behind. Fisher called this the "great paradox"—the more people pay, the more their debts weigh them down.

This is debt deflation. To understand it better, let's consider its counterpart, what might be called "debt inflation." Imagine that you are a firm or a household, and you take out a ten-year loan for $100,000 at an interest rate of 5 percent. At the time, inflation hovers around 3 percent. If inflation stays at this rate, you'll really be paying interest at 2 percent per year—that's what's left after inflation eats away at the nominal, or original, rate of interest. If inflation goes up to 5 percent a year, it will effectively wipe out the interest rate entirely, and you will have the equivalent of an interest-free loan. But if inflation runs out of control, hitting 10 percent, you're not only getting an interest-free loan; your principal is eroding as well. These examples show you how to calculate the "real interest rate"—the difference between the nominal interest rate and the inflation rate.

Confused? Let's think about a more extreme example. Imagine that you take out that same $100,000 loan—and inflation runs completely out of control. Prices and wages soar to astonishing levels. It used to cost a dollar to buy a loaf of bread; now it costs a thousand dollars. At the same time, a minimum-wage job that once paid peanuts now pays several million dollars a year; a "good" job pays a hundred million. Now go back to that $100,000 debt you incurred. It's still sitting there, denominated in those older, more valuable dollars. The amount of the principal has not changed with inflation. It's now much easier to pay off your loan. Heck, it's nothing more than a month's worth of groceries.

The key here is that the dollars you're using to pay off the debt are worth less than when you incurred the debt in the first place. For this simple reason, inflation is the debtor's friend: it effectively erodes the value of the original debt.

Deflation, however, is not the debtor's friend. Let's go back to our original example of a ten-year loan at an interest rate of 5 percent. Contrary to expectations, the economy experiences deflation of 2 percent. That means you're effectively paying 7 percent interest a year. If deflation hits 5 percent, your real borrowing costs have doubled to 10 percent a year. In other words, the dollars you're using to pay off your debt are worth more than they were when you incurred the debt in the first place. Unfortunately, even though each dollar is worth more, you now have fewer of them because your wages have declined.

The upshot of debt deflation is that debtors—households, firms, banks, and others—see their borrowing costs rise above and beyond what they originally anticipated. And during a major financial crisis—with rising unemployment, growing panic, and a general unwillingness to lend—anyone who owes money has much more difficulty making good on his debt or, alternatively, refinancing it on less onerous terms. Investors shun risky assets, seeking liquid and safe assets like cash and government bonds. People hoard cash and refuse to lend it, which only exacerbates the liquidity crunch. As credit dries up, more and more people default, feeding the original cycle of deflation, debt deflation, and further defaults.

The end result is a depression: a brutal economic collapse in which a nation's economy can contract by 10 percent or more. In the Great Depression that both traumatized and inspired Irving Fisher, the collapse was unprecedented. From peak to trough, the stock market lost 90 percent of its value, the economy contracted by close to 30 percent, and 40 percent of the nation's banks failed. Unemployment surged to close to 25 percent. And deflation? Prices fell off the cliff. A dozen eggs that cost $0.53 in 1929 cost $0.29 in 1933, a drop of some 45 percent. Comparable declines hit everything from people's wages to the price of gas.

It's no surprise that Fisher's vision was a dark one. As he wrote from the depths of the crisis in 1933, "Unless some counteracting cause comes along to prevent the fall in the price level, such a depression . . . tends to continue, going deeper, in a vicious spiral, for many years. There is then no tendency of the boat to stop tipping until it has capsized." While Fisher acknowledged that things might ultimately stabilize—after "almost universal bankruptcy"—he thought this to be "needless and cruel." Instead, he counseled that policy makers "reflate" prices up to precrash levels. As he put it, "If the debt-deflation theory of great depressions is essentially correct, the question of controlling the price level assumes a new importance; and those in the drivers' seats—the Federal Reserve Board and the Secretary of the Treasury—will in [the] future be held to a new accountability."

Those words likely haunted Ben Bernanke, Henry Paulson, and Timothy Geithner as they confronted what looked like a reprise of the Great Depression. Unfortunately, like almost everything else with financial crises, engineering a reflation—or to put it more baldly, creating inflation—is not as simple as it seems. Once a deflationary spiral has gained momentum, conventional monetary policy tends not to work. Nor does it work against other ills that accompany financial crises. Other weapons must be developed and thrown into battle.

The Liquidity Trap

When economists talk about the futility of ordinary monetary policy, they refer to a "liquidity trap." Policy makers dread this state of affairs, and to

understand why, we must examine how central banks exercise control over the money supply, interest rates, and inflation.

In the United States, the Federal Reserve primarily controls the money supply through "open market operations": that is, it can wade into the secondary market and buy or sell short-term government debt. When it does so, it effectively adds or removes money from the nation's banking system. It thereby changes what is known as the "Federal funds rate," the interest rate banks charge each other for overnight loans for funds on deposit at the Federal Reserve. In normal times, the Federal funds rate is a proxy for the cost of borrowing at any number of levels of the economy, and manipulating it is one of the most effective tools at the disposal of the Fed.

Here's how it works. Let's say that the Fed is worried about inflation and wants to keep the economy from overheating. The Fed therefore goes out and sells $10 billion worth of short-term government debt. By doing so, it effectively removes money from the banking system. Why? Because the purchasers of the debt have to write checks drawn on their respective banks, which the Fed then cashes and keeps. The banking system and the larger economy are now out $10 billion. Moreover, because banks use every dollar on deposit to create many more dollars' worth of loans, the real hit to the banking system—and by extension, the money supply—is something approaching $25 billion or $30 billion.

In this way, the Fed has tightened the money supply and made credit harder to obtain: it has effectively raised the cost of borrowing. Money, like any other commodity, responds to the laws of supply and demand, and now that the supply is lower, borrowing money costs more. Interest rates, in other words, go up because lenders can now command a higher rate. Whenever the media report that the Federal Reserve has "raised" interest rates, it hasn't literally done so; rather, it has "targeted" a higher interest rate—the Federal funds rate—via these open market operations.

Now let's imagine that the Fed is no longer worried about inflation; in fact, it's worried about the fact that the economy, instead of overheating, is headed toward a recession. The Fed therefore sets a lower target for the Federal funds rate and floods the economy with money, buying up short-term government debt. Where does it get the money? It creates it out of thin air. The Federal Reserve effectively writes a check for $10 billion and

gives it to the sellers of government debt. These sellers deposit the money they've received from the Fed in various banks. Now those banks can use it to make loans worth several times that amount. Money is suddenly more available, and as a consequence, credit is easier to obtain. More to the point, it's cheaper: the net effect of adding money to the economy is that the Federal funds rate will fall, as will interest rates generally.

This is what takes place during normal times. A liquidity trap, by contrast, is not normal. It's what happens when the Fed has exhausted the power of open market operations. That dreaded moment arrives when the Federal Reserve has driven the Federal funds rate down to zero. In normal times setting that rate would pump plenty of easy money and liquidity into the economy and spur wild growth. But in the wake of a financial crisis, cutting interest rates to zero may not be enough to restore confidence and compel banks to lend money to one another. The banks are so worried about their liquidity needs—and so mutually distrustful—that they will hoard any liquid cash rather than lend it out. In this climate of fear, the policy rate may be zero, but the actual market rates at which banks are willing to lend will be much, much higher, keeping the cost of borrowing expensive. Because it's almost impossible to drive policy rates below zero—you can't make banks lend money if they'll be penalized for doing so—policy makers find themselves in a serious quandary. They're in the dreaded liquidity trap.

During the recent crisis, central banks around the world found themselves in precisely this position. As the crisis worsened, they slashed interest rates, and by late 2008 and 2009 the Federal Reserve, the Bank of England, the Bank of Japan, the Swiss National Bank, the Bank of Israel, the Bank of Canada, and even the European Central Bank had pushed interest rates close to zero. Compared to previous financial crises, this exercise of monetary policy was remarkably swift and partially coordinated. But the collective cuts did little to stimulate loans, much less consumption, investment, or capital expenditures, as market rates remained very high given the fear and uncertainty that gripped banks, households, and firms. Nor did these cuts arrest the slide toward deflation. Conventional monetary policy ceased to have sway over the markets. The metaphor of choice was that exercising monetary policy was like "pushing on a string." It was useless.

The reason was simple: the cuts in the Federal funds rate (or its equivalent

in other countries) did not percolate throughout the wider financial system. Banks had money, but they didn't want to lend it: uncertainty bred by the crisis, and concerns that many of their existing loans and investments would eventually sour, made them risk averse. This failure of conventional monetary policy nicely illustrated an old adage: you can lead a horse to water, but you can't make it drink. The Fed could pump plenty of water or liquidity into the banks, but it could not make them lend. If they did anything with their excess reserves, they sank them into the closest thing to cash: risk-free government debt.

We can glimpse the liquidity trap in the gap or "spread" between interest rates paid on supersafe or otherwise solid investments and those paid on riskier investments. There are many ways of measuring this spread. For example, the "TED spread" is the difference between the interest rate on the short-term government debt of the United States and the three-month LIBOR (see chapter 1), the interest rate that banks charge one another for three-month loans. During normal times, the TED spread hovers around 30 basis points, reflecting the fact that the market deems bank-to-bank loans as only slightly riskier than loans to the government.

At the height of the crisis, the TED spread hit 465 basis points, because banks no longer trusted one another enough to lend money on a three-month horizon, except at exorbitant rates. At the same time, risk-averse investors fled to the haven of the safest asset of all: the debt of the U.S. government. These forces conspired to simultaneously drive up the cost of borrowing for banks and drive down the cost of borrowing for the U.S. government. The widening spread was a reflection of this dynamic, and the higher the spread, the greater the stress in the markets. So while the Fed was willing to lend money at low rates, the actual market rates at which banks lent to one another—the LIBOR—remained very high. Worse, because the rates of many other kinds of short-term loans and of variable-rate mortgages are pegged in part to the LIBOR, borrowing remained very high for private firms and households.

Measurements like the TED spread are a bit like blood pressure readings: they reflect the underlying health of the economy's circulatory system. They reveal how readily money flows through the economy, or how "liquid" markets are at a given moment. When conditions are normal, markets are relatively liquid and trust rules; people lend money to one another with ease,

and borrowing costs remain at normal levels. In a time of crisis, when the patient (the financial system) is very sick indeed, the lifeblood of the system (money) isn't flowing, despite the usual measures used to keep it healthy: namely, pursuing open market operations to achieve lower interest rates. Deflation becomes a very real possibility.

How does one deal with this sort of problem? Back in 2002, when Bernanke spoke about the perils of deflation, he alluded to a number of possible interventions. As he recognized at that time, these experimental measures carried significant risks, given "our relative lack of experience with such policies," as he rightly characterized it. The Japanese had experimented with some of these policies in the 1990s, but they remained highly controversial.

When the crisis hit, Bernanke instituted a series of such measures, aimed at cutting the spreads between the short-term—and subsequently, the long-term—rates set by the market and the short-term rates set by policy makers. To accomplish this feat, the Fed set up a series of new "liquidity" facilities that made low-cost loans available to anyone who needed them. In effect, the government jumped directly into the market, reaching far beyond the usual mechanisms of injecting liquidity—cutting the overnight Federal funds rate—and made loans directly to ailing financial institutions. It became the quintessential lender of last resort, making loans and liquidity available to an ever-widening cross section of the financial system.

Initially, the Fed aimed these maneuvers at institutions—depository institutions or banks—that already had some rights to borrow overnight funds directly from the Federal Reserve, from the "discount window" (the term refers to an earlier era, when cash-strapped banks would literally go to a teller window at the Fed). Few banks exercised this right, simply because in normal times the Fed imposed a penalty rate on anyone who approached the discount window. The window was designed to make small, emergency loans; it wasn't designed for a crisis. As conditions worsened, however, the Fed cut the borrowing penalty and allowed banks to obtain loans for longer periods of time. By March 2008, banks could borrow for up to ninety days from the discount window, with almost no penalty.

Yet the crisis worsened, whereupon the Fed then introduced new liquidity facilities. The Term Auction Facility (TAF) targeted depository institutions, giving them another means of securing ready cash for periods much

longer than overnight. But it did little to stop the liquidity crunch or the ugly cycle of fire sales, forced liquidations, and declining asset prices that Fisher had predicted. The Fed had to adopt other tools aimed at the parts of the financial system that had no existing access to its resources.

Accordingly, the Federal Reserve established the Primary Dealer Credit Facility (PDCF), which made overnight loans to "primary dealers," the banks and broker dealers with whom the Fed trades when it conducts open market operations. Another facility, the Term Securities Lending Facility (TSLF), made loans of medium-term maturity to the same group, in exchange for illiquid securities held by such institutions. Thus, for the first time since the Great Depression, the Fed used its emergency powers to lend to nondepository institutions. From there the facilities multiplied, with acronyms to rival anything devised during the New Deal: the Commercial Paper Funding Facility (CPFF), the Money Market Investor Funding Facility (MMIFF), and most unpronounceable of all, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Fund (ABCPMMMFLF), better known simply as the AMLF.

This alphabet soup of lending facilities operated in a variety of different ways and had different objectives or targets. Sometimes the facilities permitted financial institutions to borrow directly from the Fed. In other cases, they enabled financial institutions to swap illiquid assets—higher-quality asset-backed securities, corporate bonds, commercial paper—for supersafe and liquid government debt. In still other cases, the facilities directly or indirectly financed the purchase of illiquid short-term debt. Whatever the mechanism, the objective was the same: inject liquidity into specific markets that showed signs of trouble and stress. This unprecedented intervention was not as indiscriminate as it might seem. The Federal Reserve did not accept junk bonds or other low-grade debt as collateral; it accepted only what was, in theory, higher-quality debt.

These efforts eventually bore some fruit: at the end of 2008, in the aftermath of the Lehman collapse, the Fed and other central banks flooded the financial markets with hundreds of billions of dollars' worth of liquidity, and the spreads between short-term market rates and safe government assets started to decline. As cumbersome and radical as these measures were, they successfully injected a measure of liquidity into the short-term credit markets.

Nonetheless, it was arguably a Pyrrhic victory. The Federal Reserve and other central banks that instituted comparable programs had gone from being lenders of last resort to lenders of first, last, and only resort. In the process, they crossed the proverbial Rubicon not once or twice but many times.

In normal times, the lender of last resort helps individual banks with liquidity problems. But in this particular crisis, central banks ended up providing support to virtually every bank. And they did so not simply in the form of overnight loans, as is usually the case; this time the liquidity crunch was so severe that the Fed lent money for weeks or even months. In addition, it lent to institutions that had never before been recipients of such aid: the primary dealers, which included many firms that weren't banks in any sense of the word, and the money market funds. The Fed even effectively lent money to corporations via the CPFF. It also provided "liquidity support"—special low-cost lines of credit—to a host of institutions considered too big to fail: AIG, Fannie Mae and Freddie Mac, and Citigroup. Central bankers in Europe adopted similar measures.

These interventions had little or no precedent in the history of central banking. They amounted to a massive expansion of government support of the financial system. But they were only the beginning.

Last Lender Standing

As a typical crisis gathers steam, runs against a nation's banks and other financial institutions take place. Depositors in Mexico demand their pesos back; investors in Japan demand the return of the yen they've lent out. It's an unpleasant scene, but the central bank in each of those nations can save the day because it can print money to meet the demands. The domestic currency is in demand, and to quell the panic, the central banks can provide it.

But when the liabilities of financial institutions, corporations, households, or even the government are denominated in a foreign currency, the situation can unravel. Emerging-market economies may end up getting much of their financing from banks and other financial institutions in other

countries. The foreign currency in question is most often the dollar, but it could also be the euro or any number of different currencies.

If for some reason the creditors of an emerging-market economy decide not to roll over its debt when it comes due, then anyone who owes dollars has to pay off the debt. That puts debtors in a tight spot: they don't have the dollars. They can go to the central bank, but it is unlikely to have stockpiled massive foreign currency reserves, and it can't help out. Nor can it print dollars: that would be counterfeiting. So these debtors are extraordinarily vulnerable. Their predicament has been at the heart of a number of recent emerging-market crises: Mexico in 1994, East Asia in 1997 and 1998, Russia and Brazil in 1998, and Turkey and Argentina in 2001.

Enter the International Monetary Fund. The IMF was born at the end of World War II; one of its principal responsibilities has been to act as an international lender of last resort to governments and central banks who find themselves in the position so many countries did in the 1990s. The IMF was busy that decade, but in the 2000s the world's emergency-room doctor had little to do—until the crisis hit. Then the IMF once again became the world's lender of last resort to a host of emerging-market countries.

It gave this support in two forms. It extended the more traditional lifeline, a Stand-By Arrangement (SBA), to fourteen countries, with Hungary, Ukraine, and Pakistan among the biggest recipients. As with the support given to emerging markets in the 1990s, the IMF made these foreign-currency loans only if the recipients adopted economic reforms that would in theory put them on more stable ground in the future. Other more stable countries with a stronger track record of instituting financial reforms—Mexico, Poland, and Colombia—tapped unconditional lines of liquidity known as Flexible Credit Lines (FCLs). Unlike SBAs, FCLs served as precautionary or prophylactic lines of credit: the IMF effectively pledged to help out but did not immediately disburse any money.

The scale of all this lending was remarkable. By the summer of 2009, the IMF had authorized over $50 billion in SBAs and $78 billion in FCLs. Many of these lifelines overshadowed the rescue packages put together a decade earlier. In 1997, for example, South Korea received a loan of under $10 billion to tide it through the crisis that was then sweeping Asia.

By contrast, Ukraine, a country with an economy a fraction of the size of South Korea's, received a whopping $16.4 billion in 2008.

The IMF was not the only lender of last resort. In addition to its myriad domestic interventions, the Federal Reserve played this important international role, by providing "swap lines." Under these agreements, the Fed "swaps" dollars for some other central bank's currency. It thereby enables the central banks to lend out dollars to anyone needing them in their home countries. For example, in April 2009, Mexico activated a $30 billion swap line with the Fed. This infusion of money injected liquidity into the market for dollars and helped anyone who owed dollars to pay off or roll over his debt.

These actions alone were remarkable, but in one of the strange and unprecedented features of the recent crisis, even the most stable, advanced economies faced liquidity crises comparable to the ones suffered by emerging markets. Many financial institutions in Europe had borrowed enormous quantities of dollars in short-term loans to underwrite various speculations. When the interbank market froze up at the peak of the crisis, they were unable to roll over their dollar-denominated debts. Everyone needed dollars, and as a consequence, the value of the dollar went through the roof. This fact was terribly ironic: the country that was the ground zero of the financial crisis—the United States—saw its currency appreciate sharply in 2008.

Bernanke's solution was yet another bit of lender-of-last-resort legerdemain. The Federal Reserve can't lend directly to financial institutions outside the United States, but it can lend dollars to foreign central banks, who can in turn lend them to the financial institutions that need them so desperately. In return, the Fed gets an equivalent sum of whatever currency is the stock in trade of the central bank receiving the dollars. In this way, vast quantities of dollars traveled from the Federal Reserve to the European Central Bank, the Swiss National Bank, and the Bank of England, as well as the central banks of Sweden, Denmark, and Norway. In return, the Fed took custody of an equivalent amount of euros, pounds, francs, and other currencies. By late 2008 these swap lines totaled half a trillion dollars, and they started to decline only in the spring of 2009.

The crisis subsided because of these and many other extraordinary efforts undertaken to bring liquidity and stability back to the markets. But as

policy makers found out, arresting the more immediate and dramatic crisis in short-term lending was one thing; getting banks to stop the larger drift toward deflation and depression was quite another.

Nuclear Options

One of the more remarkable weapons that the Fed and other central banks brought to bear on the crisis was "quantitative easing," though Ben Bernanke advocates calling it "credit easing"; economist Paul Krugman argues that it should be called "qualitative easing." Whatever its name, a modest version of this particular strategy had been tested in Japan in the 1990s. The basic idea is to have the central bank intervene in markets for long-term debt in the same way that it does in markets for short-term debt.

Why go down the path of credit easing? The measures adopted so far hadn't worked their magic. Thanks to cuts in the overnight Federal funds rate, banks had access to plenty of cash; and thanks to the host of new liquidity facilities, financial institutions of all stripes had access to cash as well, eventually driving down the cost of short-term borrowing, as measured by the LIBOR rate. Yet for all that largesse, banks continued to refuse to make longer-term loans to the many firms and businesses that needed credit to stay alive. Banks were getting no-interest loans from the Fed, but market rates for everyone else remained high. Financial institutions continued to hoard cash in anticipation of future losses, or they sank it into the safest investments around: government debt, or "agency debt," the obligations of Fannie Mae and Freddie Mac.

Banks' propensity to park money in government or agency debt—particularly long-term debt—was understandable. By borrowing money from the Fed at policy rates approaching zero, then plowing it into a ten-year or thirty-year Treasury bond paying 3 to 4 percent, they could make a reliable profit and steer clear of all the risky borrowers who were clamoring for loans. While this strategy did nothing to ease the credit crunch, it made eminent sense from the standpoint of self-preservation.

Using quantitative easing, the Federal Reserve would attack this problem

on multiple fronts. It would wade into the financial system and start buying up long-term government debt: ten-year and thirty-year Treasury bonds. That would immediately inject massive amounts of liquidity into the market because the Fed would pay for those bonds by creating money out of thin air. As it purchased hundreds of billions of dollars' worth of bonds, cash would flow to the banks that sold them. Now the banks would have even more cash, and presumably, they would be tempted to lend it.

The Fed's actions were designed to have the additional positive consequence of reducing the attractiveness of those bonds as a future investment. Why? Because bond prices and bond yields move in opposite directions. If the price goes up, the yield goes down. When the government created a demand for the bonds by buying them up, their price went up, and their yield went down. That meant they became less attractive as a place for banks to park money. In theory, banks would therefore look for other places to sink their money and therefore would consider making loans to those starving for credit.

This policy, announced in March 2009, went hand in hand with massive purchases of other assets. On the same day the Fed announced that it would purchase upwards of $300 billion in long-term Treasury bonds, it also announced that it would buy a trillion dollars' worth of mortgage-backed securities and $55 billion worth of agency debt. As was the case with the proposed purchase of government bonds, the Federal Reserve had already made forays into these markets the previous fall. Still, the scale and scope of these interventions—particularly in the MBS market—was astonishing. So too was the announcement that the Fed would commit a trillion dollars to the Term Asset-Backed Securities Loan Facility (TALF), to support with Fed loans the private securitization of credit card debt and auto loans.

By broadening the range of assets it held, the Fed sought to prop up markets for various kinds of long-tem debt. Its intervention via the TALF program was a relatively modest attempt to revive the market for securitization. But by wading into the housing market, the Fed had bigger ambitions. Its purchases of mortgage-backed securities effectively gave Fannie Mae and Freddie Mac breathing room to guarantee more mortgages or bundles of mortgages. That strategy went hand in hand with the Fed's campaign to drive down the yield on ten- and thirty-year government bonds. Because long-term interest rates

tend to move in tandem with one another, this intervention would have the effect of lowering mortgage rates, thereby jump-starting the mortgage market. It would also help drive down the costs of borrowing for corporations.

The Federal Reserve was not alone in its use of quantitative easing. In Britain, the Bank of England was caught in a liquidity trap as well. It had cut its benchmark rates close to zero, the lowest since it was founded in 1694, and it had created liquidity facilities similar to those devised in the United States. But these moves failed to halt the prospect of debt deflation, and so in March 2009, in a bit of quantitative easing of its own, the Bank of England pledged to buy some £150 billion worth of government debt and corporate bonds. The European Central Bank followed suit two months later, pledging €60 billion to purchase "covered bonds," a form of mortgage debt.

All these interventions constituted a dramatic shift in the role of central banks. In previous crises, central banks restricted their efforts to acting as lenders of last resort. This time, however, in a series of incremental steps, central banks around the world adopted a new role: as investor of last resort. They began by creating liquidity facilities that enabled financial institutions to swap toxic assets for supersafe government debt; they thereby effectively created an artificial market for unwanted assets. At the same time, when they made outright loans, they accepted a remarkable range of collateral, everything from corporate bonds to commercial real estate loans to commercial paper. This too helped prop up the value of a range of assets.

The policy of quantitative easing, adopted by the Fed and other central banks, marked the culmination of this process: outright purchases of long-term debt in the open market. As a consequence, the balance sheets of central banks underwent a profound transformation. In 2007, for example, the Federal Reserve held approximately $900 billion worth of assets, consisting almost entirely of its stock in trade: the debt of the U.S. government. By the summer of 2009, the Fed's balance sheet had ballooned to approximately $2.3 trillion or $2.4 trillion, the overwhelming majority of which consisted of assets accumulated during the crisis. Some of these assets, such as the debt of Fannie Mae and Freddie Mac, were somewhat safe. Others were less safe, particularly those derived from home mortgages, credit card debt, and auto loans.

Most dodgy of all were the collateralized debt obligations and other

potentially toxic assets acquired during the bailout of Bear Stearns and AIG. These assets, Fed staffers reported in February 2009, represented "some of the most esoteric components of the Federal Reserve's balance sheet." It was a serious understatement. Unlike most of the assets it holds at this writing, the Fed "owns" these assets via its control of three limited-liability corporations known as Maiden Lane I, II, and III. Each is privately administered by BlackRock Financial Management. This highly unusual arrangement has attracted considerable criticism—and skepticism. It is also without precedent in the history of the Federal Reserve.

Taken together, all these actions constituted a massive and unprecedented intervention in the financial system, using conventional and unconventional monetary policy. Over the course of the crisis, Bernanke (and to a lesser extent, other central bankers) sought to counter the effects of the financial crisis with three kinds of tools. Most traditional was the provision of liquidity (lender-of-last-resort support) to a host of financial institutions, including banks, broker dealers, and even foreign central banks. Less conventional was the creation of the special facilities that purchased (or financed the purchase of) specific kinds of short-term debt—commercial paper, for example. Then the Fed began to play the role of investor of last resort, which culminated in the most radical programs of all: its commitment to intervene in markets for long-term debt (various asset-backed securities and long-term government debt).

While these measures are somewhat staggering to contemplate, they were not as crazy as some of the other options that had been contemplated during the crisis. For example, the Federal Reserve could have intervened directly in the stock markets, buying up unwanted equities. This tactic had been deployed during the Asian financial crisis of 1998, when monetary authorities in Hong Kong purchased 5 percent of the shares being traded on the local stock exchange. The measure was widely criticized at the time, but it managed to forestall a foreign exchange crisis by frustrating the attempts of some large hedge funds to pull off a "double play," shorting both the currency and the stock market. Indeed, the government went on to make a tidy profit from its investment. Likewise, the Bank of Japan adopted a similar policy in 2002, though its intervention paled in comparison to Hong Kong's and aimed merely to prop up the prices of certain bank stocks and, by extension,

the banks themselves. In 2009, it repeated these measures for much the same reason.

The Fed did not go down this road, and with good reason: it would have raised the understandable concern that the government was manipulating markets in the world's biggest economy, thereby endangering its already fragile credibility. That same concern explains why the Fed set certain limits on its other interventions. It accepted only investment-grade assets as collateral for making loans and refused to purchase low-grade commercial paper when it waded into that particular market. There were limits to how far the Fed would go to stop the crisis.

Nor did the Fed ever deploy several other extremely controversial weapons. It might have used quantitative easing on a far more massive scale, manipulating the foreign exchange markets to weaken the value of the dollar, or even employed some version of a strategy half-seriously proposed by Milton Friedman: having the government print money and scatter it on the population from helicopters. Friedman never intended that policy makers actually distribute money like manna from heaven, but there were functional equivalents of doing this: giving people tax cuts financed entirely by printing money, for example. Bernanke embraced this idea back in 2002 but never pursued it during the crisis.

Nevertheless, Bernanke and other central bankers did employ some highly unconventional measures in their efforts to put a stop to the crisis. Unfortunately, a radical remedy administered in a crisis is bound to have unintended consequences. For starters, the Fed has sent a clear message to the financial markets that it will do almost anything and everything to prevent a financial crisis from spinning out of control. That's wonderfully reassuring, but it creates moral hazard on a grand scale. The next time a crisis hits, banks and other financial firms could be forgiven for believing that the Fed will rescue them once again. In fact, now that there's a precedent for setting up special liquidity facilities and extending lender-of-last-resort support to broad swaths of the global financial system, firms may reasonably expect them to be resurrected at the slightest sign of trouble down the line.

This is a problem. As Frank Borman, the chief of Eastern Airlines, said back in the early 1980s, "Capitalism without bankruptcy is like Christianity without hell." Unfortunately, the Fed's interventions have kept afloat both

the illiquid and the insolvent; the major banks and financial firms have undergone precious few bankruptcies. Financial institutions that no amount of liquidity or regulatory forbearance can save remain in operation. Like the infamous zombie banks that became a symbol of Japan's Lost Decade, these firms must go bankrupt, and the sooner they do, the better.

But that will depend a great deal on another problem: how to unwind and dismantle the various special facilities that the Fed established in the midst of the crisis. As early as January 2009, Bernanke spoke confidently about the Fed's "exit strategy," and he clearly believes that as credit conditions improve, the financial system's dependence on easy money will subside. Perhaps. But the rescue effort that he and other central bankers oversaw is on a scale never before tried. Its extraordinarily large number of moving parts make it very difficult to know how attempts to wean one swath of the financial sector off easy money might affect other parts of the system. Bernanke has reassured anxious lawmakers that there is a plan, but we're in uncharted waters here: this level of intervention has no precedent.

The monetary policies pioneered by Bernanke have another, less noticed aspect: many of them are, strictly speaking, no longer purely a matter of managing the money supply. The Fed has instead stepped into the financial system and effectively subsidized its operations, potentially incurring losses that could ultimately fall on the shoulders of taxpayers. Put differently, it's engaging in monetary policies that bleed imperceptibly into the traditional domain of fiscal policy—namely, government's power to tax and spend. Those are prerogatives of the legislative branch, but in this crisis Bernanke's policies have blurred that line, turning the Federal Reserve's power to lend money into a means of spending money on the financial system. It has granted many subsidies to the financial system in its time of need, and it has purchased potentially risky asset-backed securities. Even its policy of purchasing long-term government debt may end up costing money: when the time comes to sell it, the Fed may well have to unload these bonds at a loss.

These encroachments on the terrain of fiscal policy, however, may have been inevitable. After all, proposals to allocate taxpayer dollars to rescue the financial system have encountered tremendous political resistance, from the first, failed attempt to secure money for the Troubled Assets Relief Program to the strong resistance to the stimulus package in the spring of 2009.

From the beginning of the crisis, there has been some resistance to using fiscal policy to combat the crisis.

That's unfortunate: the government's ability to tax and spend, while not always immediate in its effect, is one of the most powerful weapons in the arsenal of crisis economics. Still, its use carries plenty of serious risks, particularly in the recent crisis, when legislators disbursed taxpayer money not merely on the traditional objects of deficit spending but on bailouts, guarantees, and backstops of everything from banks to carmakers to the very homeowners whose troubles helped ignite the crisis in the first place.