FINANCE-LED CAPITALISM

SHADOW BANKING, RE-REGULATION, AND THE FUTURE OF GLOBAL MARKETS

ROBERT GUTTMANN

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Robert Guttmann

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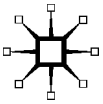

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CHAPTER 1

From Subprimes to Global Meltdown

On June 22, 2007, the US investment bank Bear Stearns announced that two of its hedge funds, both heavily invested in so-called collateralized debt obligations (CDOs), had to be bailed out. While not exactly a surprise, this announcement caused considerable consternation in the financial markets, as it shed light on a new, highly complex, and opaque financial instrument that had come under considerable pressure in recent months. If Bear Stearns were obliged to liquidate its large portfolio of CDOs, the markets worried, there could be massive contagion affecting other investors exposed to CDOs. As it turned out, it was too late to save these two funds, both of which were declared bankrupt on July 31.

Ten days later, on August 9, 2007, France's leading bank, BNP Paribas, halted withdrawals from three of its investment funds because it could no longer reliably calculate their respective net asset values. Not only had the value of mortgage-related components in the portfolios of these funds dropped sharply in recent weeks, but some of these assets had become impossible to value as trading in them had ceased altogether. Confronted with such a shocking acknowledgment of deep trouble in an important segment of the bond market with considerable global reach, the markets panicked. At the end of that day, the European Central

Bank had pumped 95 billion euros into the overnight lending market as many banks had refused to lend to each other while demand for cash surged. The so-called subprime crisis, which would morph into one of history's greatest financial crises and bring the world economy to the edge of the abyss a year later, was on.

The Rise of Private-Label Securitization

How did we get to this point of no return? Roll back five years, to the autumn of 2002. While most Americans were still reeling from the 9/11 attacks on the Twin Towers and the Pentagon, the financial world was then also preoccupied with the fallout from the Enron scandal. Much attention was paid to the veracity of financial statements, to the quality of the accountants' work, and to a call for greater transparency about the bottom line. This heightened focus would soon turn to the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac, both charged by Congress with providing support to housing finance and so facilitate access to home ownership. These financial giants had each reported smooth earnings through a period of extraordinary expansion in the late 1990s with sharp volume declines during the recession of 2000/01. That raised suspicions, which were later reinforced by additional data Fannie and Freddie were obliged to publish. Several investigations subsequently brought to light considerable accounting manipulation by both Fannie and Freddie, manipulation that was aimed at smoothing out volatile earnings and hiding losses. Once again, as had been the case with the spectacular failures of Long-Term Capital Management in 1998 and of Enron in 2001, complex derivatives trades in the context of unexpected turns in market conditions had caused massive losses.[1]

That accounting scandal weakened Fannie and Freddie considerably, at a time when political foes on the right controlled the Senate and the White House. Until then Fannie and Freddie had single-handedly taken over US housing finance by pioneering the issue of mortgage-backed securities (MBS) whereby

similar mortgages would be pooled together to back the issue of bonds and then have the income generated from within that pool of loans passed on to the investors holding those bonds (minus a service fee going to the issuer for managing the securitization of loans). The invention of MBS, starting in the early 1970s, had gradually transformed funding of home ownership, one of America's most cherished social-policy goals, by turning a hitherto highly illiquid loan into a more liquid security. In the process, considerable (credit, interest, and liquidity) risks were transferred from lenders to a larger group of investors. Both advantages made banks willing and able to boost their volume of mortgage lending greatly, and so they did.

When a combination of more rapid growth and falling long-term interest rates in the mid-1990s created the necessary conditions for a housing boom, the issue of MBS rose from about $350 billion per year in 1995 to over $1 trillion each in 1998 and 1999. Much of that tripling in volume was the work of Fannie and Freddie, but a steadily growing portion of MBS was at that point issued by banks (so-called non-agency or private-label MBS), which had pushed their market share to 15 percent of the total by the end of the decade. Banks wanted to get into the business of issuing MBS themselves not least to earn the steady stream of service fees in lieu of the (more volatile) interest income given up in the wake of securitization. But in that effort banks were still marginalized by Fannie and Freddie; besides having the advantage of implicit government support, Fannie and Freddie also set the (rather stringent) underwriting standards with which banks had to comply.[2]

Now, in the early 2000s, the banks finally had a chance to fill the vacuum created by the scandal-induced retrenchment of Fannie Mae and Freddie Mac and to boost their share of the MBS market. While the overall volume of MBS issues stabilized during that period at around $2 trillion, the share of so-called nonagency MBS rose rapidly from 24 percent of the total in 2003 to 57 percent in 2006. The largest private-label issuers included well-known commercial banks such as Wells Fargo and Bank of America, leading investment banks such as Bear Stearns,

Lehman Brothers, JP Morgan, or Goldman Sachs, and a host of rapidly growing thrifts or finance companies specializing in new types of higher-risk mortgages (notably IndyMac, Washington Mutual, and Countrywide). All these private lenders sought to use mortgage securitization as a means of transforming their modus operandi into what would ultimately come to be known as the originate-to-distribute model.[3]

Rather than holding on to loans as in the traditional intermediation process of "indirect finance" (i.e., taking deposits and making loans), banks now sought to rebundle their loans with the intent of selling them off as soon as possible to other investors. This practice would make the banks less dependent on inherently volatile interest income and more capable of generating lucrative and stable sources of income instead, such as commissions (from loan origination), underwriting fees (from securitization), and service fees (from managing the asset-backed securities). At the same time the new model also allowed banks to transfer the risks associated with loans—the risk of default (credit risk), the risk of a yield curve inversion pushing short-term deposit rates above long-term loan rates (interest-rate risk), and the risk of financing long-term commitments with short-term funds (liquidity risk)—to third parties. There was also a lot more growth potential in the new business model, as banks would get their funds back much more rapidly to launch a new round of lending. An additional advantage arose in the context of new global banking regulations, known as Basel I and Basel II, that required banks across the planet to calculate their risks and then set aside more capital for higher-risk assets. In the originate-to-distribute model, banks would generate assets they then did not keep on their books and therefore did not have to back with additional capital, even though they could still earn income from these off-balance-sheet operations. This manipulation typically involved the setting up of supposedly independent special purpose entities (SPEs) through which the securitization operation would be conducted as if it had nothing to do with the originating bank.

Nontraditional Mortgages

Mortgage securitization could move to a much higher level of operation and accommodate an aggressive push by private lenders during the decade preceding the crisis because there was so much investor demand. Rooted in an extraordinary expansion of the financial services sector overall, a plethora of nonbank institutions arose, notably mutual funds (often spawned by the banks themselves), finance companies, and hedge funds. All these new players were looking for assets with higher yields at a time when interest rates on traditional government or corporate bonds were declining to historically low levels. And MBS offered higher yields than traditional bonds with seemingly little additional risk, considering that credit-rating agencies like Standard & Poor's or Moody's had given many of these MBS triple-A ratings. In effect, the demand for American MBS was global, taking account of the fact that in the 2000s half of the world economy still conducted its cross-border operations denominated in US dollars. Hence, a large number of foreign investors sought higher-yielding assets for their dollar reserves.

This large demand assured the rapid expansion of the MBS market, which in turn deepened and widened the use of mortgages in the United States. By incorporating the prepayment risk of mortgages being paid off before maturity, the MBS were structured to accommodate a good deal of refinancings. This made it much easier for lenders to allow mortgages to be refinanced, especially when prices of the underlying homes serving as collateral rose, as they did in accelerating fashion once the housing boom took root. Homeowners could simply get a larger mortgage, a second mortgage, or a home equity loan to draw additional cash from the rise in the value of their real estate assets, thus increasing the use of mortgage loans. This practice had obvious macroeconomic consequences that were already manifest in the late 1990s but became much more important during the 2000s in the run-up to the crisis. Consumer spending in the United States could increase significantly even in the face of relatively stagnant wage incomes. And capital gains replaced

savings as more and more US homeowners began to treat their homes like an ATM to draw cash from. Amid this powerful "wealth effect" the US savings rate, always comparatively low, collapsed in the 2000s and even turned negative toward the end of the boom.[4]

When the banks broke the market hold of Fannie and Freddie, they did so by loosening the underwriting standards of new MBS in pursuit of aggressive volume expansion. In the process, the banks not only promoted more and more mortgage lending (through refinancings and home-equity loans), but they also sought to widen the pool of mortgage users. Part of that market expansion strategy involved coming up with new mortgage products to give traditional borrowers a greater variety of choices, such as five-year fully amortized adjustable-rate mortgages or interest-only mortgages. Banks began pushing so-called deferred-interest (also known as negative-amortization) mortgages; with these mortgages borrowers made monthly payments below the interest charged over the period so that the outstanding balance of the loan steadily grew. The banks liked this product, because they could offer very attractive initial "teaser" rates (typically 1 percent) without necessarily explaining to unsuspecting clients the consequences of negative amortization (NegAm). NegAm mortgages often came with an additional source of deception, making it look as though monthly payments could increase only by a small amount. However, in reality, according to clauses in the contract, payments could increase dramatically once certain of those conditions had been met.[5] Such loans were also in great demand among professional real estate investors who intended to resell their properties before the NegAm period expired; in the meantime, they carried really cheap loans, thereby fueling purely speculative demand for real estate assets as is typically the case when booms turn into bubbles.

The most important expansion strategy pursued by private lenders, however, concerned nontraditional mortgage products offered to those previously denied any access to home ownership. Among these new products were "piggyback mortgages," where a borrower takes out a second mortgage or a home-equity loan

at the same time as the first mortgage is started or refinanced. The initial justification for such an arrangement was to reduce the loan-to-value ratio of the first mortgage to less than 80 percent and so avoid expensive private mortgage insurance. But in the euphoria of a speculative bubble piggybacks soon became a means to acquire homes with no down payment. Other nontraditional mortgages gaining ground in the 2000s were the so-called Alt-A mortgages (short for Alternative A-paper), which carried a higher risk that made them ineligible for purchase by Fannie Mae or Freddie Mac. Among these higher risks were borrowers with less than full documentation, lower credit scores (below 650), higher loan-to-value ratios, or multiple properties. In any case, Alt-A loans carried higher interest rates than the traditional prime mortgages eligible for repurchasing or securitization by the GSEs.

A third, and by far the biggest, category of nontraditional mortgages arising between 2002 and 2006 in the US housing boom were so-called subprime mortgages that were offered to borrowers with poor credit histories and the resulting low credit scores (typically less than 600) at correspondingly higher yields. While the spread of these subprimes offered marginalized groups a chance of homeownership for the first time, that social benefit was to last only a very short time. Private lenders, especially a new generation of aggressive mortgage lenders such as IndyMac or Countrywide, faced the problem of how to get inherently vulnerable borrowers willing and able to pay more for their loans than stronger debtors would have to. Thus, they offered subprime mortgages typically as interest-only loans, increasingly also with very low initial teaser rates of 2 or 3 percent, which would reset to fully amortized interest-plus-principal loans after, say, two years. Both the lenders and their borrowers could always tell themselves (and each other) that rising housing values would surely allow refinancing of such subprimes before the reset date arrived. Thus, the borrowers would avoid such a drastic payment hike indefinitely. For those refinancings to be possible on a large scale, subprimes had to become part of the securitization process.

As it turns out, much of the aforementioned expansion of the banks' market share in MBS issues between 2003 and 2006 came about in the wake of their lowering of underwriting standards to include a rapidly growing proportion of these nontraditional mortgages. Data from *Inside Mortgage Finance* shows that the share of prime mortgages in the newly issued mortgage-backed securities amounted to 52 percent in 2003, but then declined precipitously to just half of that, 26 percent, in mid-2006.[6] During the same period, the market share of Alt-A mortgages rose from 14 percent to 30 percent and that of subprimes from 34 percent to 44 percent. In other words, just before the crisis hit, below-investment-grade mortgages of the nontraditional kind made up three-quarters of the newly issued MBS. While the inclusion of risky mortgages in still-top-rated MBS could be accommodated by means of various credit enhancements (e.g., additional collateral, insurance, or bank-provided letters of credit as well as other third-party guarantees), those measures designed to improve the creditworthiness of the debtors did not suffice given the scale of Alt-As and subprimes issued and securitized by the banks. Another means had to be found to facilitate the massive securitization of higher-risk mortgages and concomitant relaxation of underwriting standards among private lenders, and this facilitator arose with the successful launch of CDOs by the same institutions pushing the issue of higher-risk mortgages and MBS.

Structured Finance

As private lenders began a concerted push to issue and securitize nontraditional mortgages in 2002/03, they soon ran into the problem of how to maintain high credit ratings for MBS containing many risky loans. Their answer was so-called *structured finance,* which would apply the logic of risk diversification by splitting MBS into different "tranches" distinguished by their respective ranking in a hierarchy of payoff priorities. In that multitiered payoff structure the bonds in the highest rated tranche would be paid off first, thus making

them safer to the point of deserving an AAA rating. Then the bonds in the second-safest tranche would have their interest and principal paid off next, allowing those to be rated AA, followed by the bonds in the A-tranche, the BBB-tranche, the BB-tranche, and finally an unrated (so-called equity) tranche as the first one to absorb any losses. The lower the rating of the tranche, the higher its yield to compensate for its intrinsically greater default risk (even though the tranches may all contain exactly the same mixture of mortgages). Typically, the MBS were structured so that the highest-rated (AAA) tranche would absorb at least half of the total issue, with the other half comprising three or four higher-risk tranches of, say, 10 to 15 percent each.

The problem with that setup was trying to sell the lower-rated tranches. While there was no shortage of demand for the most senior (AAA) tranche, MBS issuers soon realized that they had a much more difficult time finding enough buyers for the less senior tranches rated AA to BB. This was especially true for the BB-rated bonds, since those were below investment grade and therefore could not be bought by the traditional institutional investors, such as mutual funds or pension funds. But without selling off those higher-risk ("mezzanine") slices of their MBS, they could not hope to launch the MBS in the first place. Their solution to this barrier was to go one step further in the securitization process by taking mezzanine tranches out of the MBS and repackaging them into a new securitization instrument known as collateralized debt obligations (CDOs).[7] Even though they were made up of higher-risk collateral, these CDOs could be rated highly by assuming that the underlying real estate assets were regionally diversified and hence supposedly "uncorrelated." That assumption had its roots in the notion that the US housing market comprised distinct regions and had never experienced a nationwide downturn, with prices falling and foreclosures rising everywhere at the same time. Hence, the senior tranche of any CDO, typically comprising 70–80 percent of the total issue, could be given an AAA rating, since it was historically unprecedented to have anywhere near a 20 percent or 30 percent loss

on any combination of housing assets spread across the nation. The lower-rated tranches of any CDO could be sold to less risk-averse investors, such as hedge funds, or be rebundled a third time for further securitization into what came to be known as CDO-squared.

That strategy worked and so fueled the US housing boom to the point of turning it into a bubble. AAA-rated CDOs were considered safe even though they consisted entirely of higher-risk MBS tranches. Trust in those ratings was essential, since investors buying those CDOs had no way of knowing what these inherently opaque instruments contained in terms of collateral. Given their high ratings, CDOs offered very attractive yields exceeding those of similarly rated Treasuries, corporate bonds, or MBS. Between 2003 and 2006 Wall Street issued over $700 billion worth of CDOs containing mezzanine tranches of MBS as collateral, and the overall global market for CDOs rose to $1.5 trillion. Banks got hooked on issuing CDOs, not least because they did not have to show those on their books (and hence hold capital against). The CDOs were actually set up as special purpose entities, so-called orphan companies, that could thus be treated "off-balance-sheet" with respect to the sponsor of such a structure. The CDOs themselves would typically take on debt to fund their securitization operations, using in the process leverage to boost their returns further. Bankers also liked the issue of CDOs as a source of hefty fees for themselves, their orphan structures, and above all the rating agencies with whom they worked closely together in the launch of new CDO issues and whom they paid handsomely for the service of obtaining high ratings that assured steady investor demand.[8] At the peak of the bubble, in 2005 and 2006, CDOs were increasingly buying up the lower-rated "mezzanine" tranches of other CDOs, thus collectively assuring the rapid-growth capacity of this new, highly profitable funding mechanism. And the extraordinary growth of the CDO market during those years facilitated in turn the dramatic expansion of Alt-As and subprimes, which now had a steady supply of assured funding for their speedy securitization.

Synthetic Finance

We can see already in this story the crucial role financial innovations play in the promotion of speculative bubbles. The funding pipeline linking a new generation of nontraditional mortgages, MBS, and CDOs experienced an additional acceleration at the peak of the bubble, in 2005 and 2006, by means of so-called credit default swaps (CDS). These CDS serve normally as protection against defaults and other "credit events" putting the proper servicing of existing debt at risk (e.g., bankruptcy, restructuring, moratorium). In such an arrangement an investor holding debt from, say, a company, may want to buy a hedge against default of that debt (known as the "reference" security) by engaging a third party to pay out an agreed sum in case of such a debt-servicing disruption. In exchange for this hedge the investor pays his counterparty regular premiums for the duration of the contract between them. While in effect serving as a sort of insurance against defaults and other debt-servicing disruptions, the CDS do not have to comply with prevailing insurance regulations. This exemption from regulatory restrictions has made CDS easy to issue and given the parties involved great flexibility in designing highly customized contracts meeting each side's specific needs. In contrast to insurance companies, counterparties selling CDS do not have to put up any reserves or initial collateral with which to cover their exposure to potentially large payouts. In addition, parties with no "insurable interest" are also allowed to buy CDS as a pure bet on the default likelihood of the "referenced" debt. These so-called naked CDS are a perfect vehicle for speculators placing bets on the creditworthiness of all kinds of debtors.

It is this last feature of CDS that has turned them into a tool for speculative bets on portfolios of securities that one does not own. Usage of naked CDS became more widespread at the peak of the US housing bubble. At that point, in late 2005 and early 2006, it had already become more difficult to issue new MBS and CDOs as the market for mortgage lending had finally begun to show signs of saturation. At the same time, investor demand for the higher-yielding MBS and CDOs remained

strong, prompting their issuers to figure out how best to maintain the fast pace of securitization even in the face of a slowdown in the generation of loans to be securitized. What they came up with was a new use of naked CDS with which to replace the traditional CDOs, an example of so-called *synthetic finance*. Apart from the normal group of investors typically buying CDO tranches and earning interest and principal payments in return, there would now be a second group of unfunded investors who would effectively enter into a swap agreement with the CDO to take a "long" position on the referenced securities agreed to. That meant that these investors would receive regular premiums from the CDO in exchange for paying out cash if the referenced securities did not perform or the CDO ended up with insufficient funds. At the same time, a third group of "short" investors would enter into swap agreements with the CDO on the other side of the equation, paying the CDO swap premiums while committing the latter to pay them if the referenced securities failed to perform.

In this complex arrangement known as synthetic CDO, in which CDOs served as intermediaries between short and long investors in CDS, swap premiums replaced a significant portion of interest and principal payments usually found in cash CDOs. Many of these synthetic CDOs involved setting up special purpose entities (SPEs), which would administer these arrangements by packaging and holding the underlying assets, picking the securities to reference, and managing the swap agreements. Those SPEs would also use excess cash inflows from bondholders and short investors to amass separate collateral securities with which to meet their payment obligations. Such synthetic CDOs could be set up much more easily and rapidly than cash CDOs because there were no mortgage assets to collect and finance. Hence their use exploded when cash CDOs became more difficult to issue, jumping from $15 billion in 2005 to $61 billion in 2006. Between 2005 and 2007 a total of $108 billion in synthetic CDOs were issued.[9]

We now know that there was a lot of abuse in how those synthetic CDOs were actually set up. For one thing, they involved

highly leveraged bets that did not require any cash up front but might involve large payouts by the unfunded investors far in excess of the swap premiums they received. Moreover, in synthetic CDOs only the highest-rated ("super senior") tranches were fully funded while the riskier tranches were not. The super senior tranches were never considered at risk at all, and many of the issuing banks kept them on their books or insured them with undercapitalized "monoline" bond insurers. That haphazard architecture of inadequately funded commitments was not going to survive a shock to the system. And sooner or later there was bound to be such a shock, not least because of an intrinsic bias toward greater use of synthetic CDOs just as the cycle turned from boom to bust. When signs of trouble began to appear in the US housing market in the second half of 2006 amid rising interest rates and increasingly unaffordable housing prices, subprime mortgage origination basically ran out of risky borrowers to make questionable loans to and so slowed the pace of cash CDO issues. Synthetic CDOs could then easily fill that vacuum inasmuch as those same signs of trouble made investors holding short positions, mostly investment banks and hedge funds, more willing to use CDS for bets against repayment of bad home loans and continued performance of referenced securities tied to those. The fact that the same portfolio of securities could be referenced for any number of synthetic CDOs might have helped meet this boost in short-investor demand, but it also amplified the collective risk created by those complex and opaque arrangements. The perverse nature of such a market bias in favor of greater use in the face of impending trouble is perhaps best exemplified by investment banks, such as Goldman Sachs, issuing synthetic CDOs and simultaneously taking a short position on them while hiding that fact from unsuspecting long and funded investors who were convinced that they were buying into an AAA rating.[10]

The Collapse of the Securitization Infrastructure

All speculative bubbles burst eventually. There has been plenty of historical evidence from economist Charles Kindleberger and

others suggesting that the longer and/or stronger the bubble, the greater the destructive force of its violent end.[11] This conclusion surely has been confirmed by the collapse of the real estate bubble in the United States, which began as a boom in the mid-1990s and then resumed with increased force in 2003, after a short pause during the recession of 2000/01. This boom's intensification into an outright bubble from early 2005 onward was fueled by a series of intertwined, mutually reinforcing financial innovations attracting an ever-growing number of investors seeking to profit from the rapid price appreciation of the underlying assets, another hallmark of bubbles. With bubble-induced euphoria prompting a generalized underestimation of risk and greed accentuating recklessness, all these innovations were pushed to the limit, perhaps even beyond that. Fraudulent behavior became the norm, as often happens near the peak of booms when the bubble is about to burst. All this rendered the inherently fragile financial innovations fueling that bubble even more vulnerable, leaving them deeply exposed to a destructive shock about to arrive. We need to appreciate this excessive fragility of the securitization infrastructure to understand why it could disintegrate so rapidly and thoroughly once the crisis hit.

In retrospect, the collapse of America's real estate boom could have been predicted quite easily even though very few forecasters did at the time. Any speculative bubble exhausts itself when asset appreciation has gone so far as to price marginal buyers out of the market and/or leverage has become so excessive that the pace of indebtedness needs to slow down. Add to these microfoundations of its burst the bubble's macroeconomic destabilization effects of excessive consumption fueled by capital gains and easy credit, a collapsing savings rate, and growing current account deficits—the precise constellation of the US economy in 2006/07. Already by mid-2004 the Federal Reserve, America's central bank, had decided to "lean against the wind" of bubble-fueled growth with a policy of gradual tightening. Its 17 consecutive quarter-point increases from June 2004 onward pushed the Federal funds rate from its cyclical low of 1 percent to 5.25 percent two years later. At that point the policy began to take its

toll, causing the prices of US homes to reach their peak pretty much across the entire nation. And with prices stopping to rise, the creaky securitization infrastructure began to crack.

The crisis trigger was almost preprogrammed. With the volume of subprime mortgage lending exploding in 2004 and 2005, one could expect a massive resetting of the initially low "teaser" rates at double or triple the rate about two years later. At the time neither borrowers nor lenders thought they would have to face that reality, because rapidly rising home prices would surely make it easy to refinance the mortgage before it reset to much higher monthly payments. With US home prices rising by a national average of 14 percent during 2005 alone, this was not an unrealistic assumption at the time. But when a lot of subprimes came due for their reset during the second half of 2006 and first half of 2007, they could no longer be refinanced as home prices had stopped rising nationwide. As those vulnerable borrowers suddenly faced much more expensive debt they could not afford to service, many went into default and eventually foreclosed on their home. Between mid-2006 and mid-2007 the share of subprimes seriously in default (with nonpayment of monthly interest payments exceeding 90 days) jumped from 6 percent to 9 percent of all subprimes, and the foreclosure rate almost doubled during the same period.

This deterioration had an immediate, thoroughly negative impact on the MBS and CDOs that had funded the boom in nontraditional mortgages. Suddenly, those securitization instruments no longer looked so attractive, as became evident when the ratings agencies started downgrading many of the MBS and CDO during the first half of 2007. At this point two major points of vulnerability came to the fore that stressed the whole infrastructure of securitization to the breaking point.[12] For one, nervousness about potential losses from MBS did not confine itself to the lower-rated mezzanine and unrated equity tranches, which were the first buffers to bear any losses and so disproportionately at risk. The relatively sudden and unexpectedly strong spikes in subprime-related losses shook investor faith in even the better-rated tranches, since investors could not know how

many subprimes were distributed in the aggregate of any MBS across its different tranches and what proportion of those would eventually default during an impending downturn in the housing sector. Such loss of faith was even more pronounced in the case of the CDOs, because those represented more concentrated risk to the extent that they were made up entirely of lower-rated MBS tranches. The opaque nature of these securitization instruments, which made it basically impossible to estimate or pinpoint losses as they arose, prompted investors to overreact in the other direction. Once euphoria was gone, surely by early 2007, it did not take long for outright panic to set in.

The spreading change in sentiment revealed yet another point of great vulnerability in the securitization infrastructure embedded in the very structure of the markets for MBS, CDOs, and CDS. All of these instruments were traded in so-called over-the-counter (OTC) markets. These consist of bilateral transactions between dealers (i.e., the institution "dealing" with this particular security) and their customers for which neither the prices nor the volumes of any trades are publicly disclosed. In contrast to public exchanges (e.g., New York Stock Exchange), where enough information is publicly available for transparent price discovery, OTC markets lack this essential market mechanism. When they come under stress, there is no way to find out what the prevailing market price would or could be. If panic hits a public exchange, its prices may tumble, but they are always accessible to the public. And if they have fallen far enough, buyers will at some point reenter the market to pick up the pieces and thereby possibly launch a recovery. If on the other hand panic hits an OTC market and investors do not know what their prices are, they will just stop trading, and in that case market activity simply ceases. OTC markets also do not have the surveillance capacity of public exchanges to identify where large and vulnerable positions have accumulated. Hence, they cannot intervene proactively and are more vulnerable to bad surprises. Unlike the designated market makers in public exchanges (so-called specialists), the OTC markets lack third parties whose major function it is to assure orderly market conditions and

provide liquidity under pressure. Finally, the bilateral nature of OTC deal-making also preempts clearing and settlement mechanisms common in public exchanges where they intervene as intermediaries to make sure that any deal is carried out as contractually prescribed. In other words, OTC markets at the center of the securitization pipeline MBS <-> CDO <-> CDS lacked all the market mechanisms—transparent price discovery, market makers, clearinghouses—that would have given them needed resilience in the face of the subprime default shock. And so they just crumbled, simply disintegrated, when euphoria turned into panic.

That spectacular collapse of the securitization infrastructure actually occurred at several spots at the same time, and each of these ruptures reinforced disintegration pressures elsewhere. Think of the whole thing as a web of interdependent affiliations, with the banks in the middle. Each actor in that web contributed to its ultimate demise by acting irresponsibly so that chickens were coming home to roost all over the place. Hence, that web was getting torn apart simultaneously in all four of its corners. Let us start with hedge funds, a good number of which ended up as crucial yet also very obscure actors near the center of the web. Those players, known for demanding from their clients extraordinarily high management fees (2 percent) and a large share of their profits (20 percent), also stand out for not disclosing their assets, liabilities, and trading positions—not to their clients and not to the public. They were highly leveraged, having taken on a lot of debt (typically from banks via broker loans) to boost their returns from any correctly anticipated price movement.[13] This leverage magnified their market impact. Let us assume that a hedge fund operated with a leverage ratio of 1:5, a conservative assumption. If it then invested $100 million of its own capital, it could buy $600 million worth of mezzanine tranches of a CDO, which in turn, assuming that those make up 20 percent of the total issue, financed a $3 billion CDO. Thus, if hedge funds got into trouble and stopped trading, they were bound to have a huge negative impact on the MBS or CDO markets overall. And into trouble they surely got! When the wave of subprime

defaults hit the high-risk tranches and depressed their values to who knows what, hedge funds faced margin calls from their brokers just when their key assets, those mezzanine tranches, had become illiquid.[14] It did not help that nobody knew exactly what those tranches were worth or would be worth the next day. No longer able to adjust and trade out of losing positions in the face of margin calls, many hedge funds went bankrupt. Even those still alive took big losses and stopped buying MBS- or CDO-tranches, thus bringing these markets literally to a halt from one day to the next. While there were $738 billion of private-label MBS issued in 2007, there were only $37 billion issued in 2008. The collapse of the CDO market was even more pronounced, especially in terms of its price impact. While the senior tranches of MBS may have halved in value at the peak of the crisis in 2008, pretty much all of the (even top-rated) CDO tranches had become worthless junk by the end of that year. Striking here also was that, notwithstanding regional differentiation of the American housing market, the collapse of MBS and CDO issues was a nationwide affair.

When the MBS <-> CDO <-> CDS funding channel broke down, it also had immediate consequences at the other end of the pipeline where the mortgages originated. The so-called mortgage banks specializing in nontraditional loans, such as subprimes, were actually for the most part thinly capitalized finance companies or aggressive thrifts. Both types had to fund themselves by borrowing in the money markets and so had an incentive to get rid of their loans rapidly by having them securitized as quickly as possible. But once trading and issuing of mortgage-related securities stopped, these lenders could no longer get rid of their mortgages and so had to take the brunt of losses on those while also getting squeezed out of the money markets. It is not surprising then that all the major mortgage banks, notably IndyMac or Countrywide, bit the dust fairly early on in the crisis. To the extent that mortgage origination slowed to a trickle, it exacerbated the housing crisis, especially in the high-risk segment of subprimes where refinancing had become impossible and sticker shock on interest resets exploded during the second

half of 2007 and the first half of 2008. A nationwide housing depression was on.

At the center of the collapsing securitization infrastructure, banks too suffered huge losses; even worse, these were losses they had no way of measuring with reasonable accuracy. Those losses appeared along all the lines of the web they had constructed. Their loans to hedge funds were at risk. At the peak of the bubble proprietary trading desks of key banking institutions had bought up many mezzanine tranches of CDOs from each other that now were worthless. To the extent that the banks had ended up keeping many of the senior tranches on their own books, especially during the final-phase push into synthetic CDOs, they faced rapidly accumulating capital losses from the downgrade avalanche hitting even the best tranches of MBS and CDOs. That problem grew worse when many banks had to step in and take over the assets as well as liabilities of the now-collapsed special purpose entities (SPEs) they had initially sponsored as off-balance-sheet entities for their securitization operations.[15] No matter what the reason, mortgage-related securities on the books of banks rapidly became "toxic" in the sense that no one else wanted them at any price so that banks were condemned to keep them on their books indefinitely. Finally, banks also faced massive losses on their mortgage-related lending amid what ultimately would turn into the deepest real estate downturn in the history of the United States, both in their financial support to mortgage lenders specializing in subprimes and also with regard to their direct lending to households. The huge losses suffered by the banking sector cumulatively included also foreign banks many of which had joined the US housing bubble relatively late and hence that much more aggressively in order to catch up.

Money Market Spillovers

The fact that so many banks suffered such large losses so rapidly when mortgage-backed securitization seized up would have been a big enough hit to create tensions in the world's money markets. But that crucial segment of our financial system, where banks

as well as nonbank financial institutions tap short-term funds for their operations, had another paralyzing stressor to face as fallout from the sudden demise of securitization: a full-scale panic hitting so-called asset-backed commercial paper (ABCP). The ABCP involves issuing and selling commercial paper, in essence a short-term bond with maturities ranging from 1 day to 9 months (with an average of 30 days), which is backed by a pool of different assets. Such collateral may include commercial loans, student loans, credit card debt, or a variety of asset-backed securities. Most of those assets were AAA-rated, thus rendered acceptable to risk-averse money market mutual funds, which soon emerged as the main buyers of ABCP. The funds provided by those investors would allow the ABCP issuers, typically special purpose entities known as conduits acting on behalf of their sponsoring institutions without showing up on their respective balance sheets, to buy up longer-term assets whose returns were usually higher than the yields paid to investors. In that sense ABCP provided maturity intermediation (using short-term liabilities to fund long-term assets) much like banks, except that they did not benefit from deposit insurance as the banks do.

The issue of ABCP grew steadily during the 1990s and early 2000s, but then saw a sharp acceleration in the mid-2000s when it turned into a short-term funding source for the longer-term (MBS and CDO) securities underpinning the US housing boom. That change rendered ABCP more vulnerable for two reasons. First, such short-term paper came to include more and more mortgage-related products in its collateral pool (e.g., MBS tranches). And second, it came to be issued by a new type of bank-sponsored conduit known as structured investment vehicle (SIV), which was ultimately more vulnerable to any market shock. Unlike the more traditional ABCP conduits, notably multiseller conduits or security arbitrage conduits, the SIV did not contain any third-party credit enhancements as protection against losses. And while all ABCP is vulnerable to any market disruption affecting its collateral pool, SIVs were even more prone to paralyzing shocks due to heavier exposure to mortgage-related products and the need for weekly mark-to-market valuation of

their assets. That is why the aforementioned announcement by BNP Paribas on August 9, 2007, admitting its inability to value three of its funds with heavy exposure to US mortgage-securitization instruments had such a devastating impact on the ABCP segment of the funding chain. Suddenly investors could no longer reliably value the underlying collateral of SIV issuing asset-backed commercial paper, and so the (typically very risk-averse) money market mutual funds buying that paper refused to do so from one moment to the next.

The BNP announcement triggered an indiscriminate panic, paralyzing the entire ABCP market for the next six weeks, followed by slightly more selective "flights to quality" all the way to the end of 2007.[16] In all, the ABCP market, which had reached $1.2 trillion just before the BNP announcement, contracted by $350 billion during the last five months of 2007. Much of this decline was due to an inability to refinance ABCP programs when they came due. While this 30 percent contraction spread over the entire ABCP market, it was devastating to its segment related to SIVs mortgages, which collapsed entirely. Rules for the protection of investors obliged SIVs to liquidate their collateral once its value had fallen by half. Hence, a number of those conduits dumped their mortgage-related products at the same time, one of the main reasons why the market for those products ceased to exist. There was an intense negative feedback interaction between the simultaneously collapsing MBS/CDO (asset) and ABCP (liability) pillars of the securitization machine. Amid this dual panic the banks, serving as sponsors of ABCP conduits, came under enormous pressure when their SIVs fell apart. Not only did they have long-standing credit-line support commitments to the ABCP market in general, which now came massively due, but they also faced severe reputational risks. A sponsor might not have any legal responsibility for the conduit it set up. But it would simply look terrible if a large well-known bank refused to repay the investors of its SIVs, who had thought that their money was safe in a cash-like asset. Cognizant of this danger, ten of the largest American banks and the US Treasury Department reacted swiftly to the ABCP panic by trying to set

up a rescue fund, in effect a Super SIV provisionally referred to as Master-Liquidity Enhancement Conduit (M-LEC), which would buy up the assets of their SIVs. But disagreements over loss-sharing and funding allocations among prospective consortium members led to the failure of this M-LEC proposal in late October 2007. Now it was up to the banks to resolve their SIV-crisis individually. Just before Christmas 2007, Citibank, the bank with the largest exposure to SIV-related losses, set aside $48 billion to take the combined assets and liabilities of its three principal SIVs onto its own balance sheet. This enormous sum highlighted the extraordinarily costly challenge facing US banks having to bail out their destroyed SIVs.

Even before Citibank's charges for its SIV debacle, US banks knew that they were facing potentially huge losses from the disintegration of their mortgage-securitization machine. The ABCP panic during the second half of 2007 only reinforced their fears of worse to come, highlighting the fact that they had engaged massively in high-risk activities for which they purposefully had not set aside any capital. Bankers reacted to this realization by hoarding cash and refusing to lend to other banks on favorable terms, knowing that those too were surely in deep trouble. Already at the very onset of that panic, triggered on August 9 by the fateful announcement of BNP Paribas, the global interbank market simply froze and so deprived all kinds of banks and other financial institutions of needed access to short-term funds to support their longer-term assets. Despite the immediate intervention of central banks pumping additional liquidity into the interbank market, the money markets stopped functioning smoothly from that point onward. Worried about their losses and needing a lot of cash to meet margin calls, the banks simply preferred to hoard their cash rather than loan it out to each other. This reaction, while rational from the point of view of an individual bank, proved disastrous for the banking system as a whole. In its milder form the money market freeze pushed short-term interest rates for the riskier borrowers up, possibly above the rates earned on their longer-term assets and creating thereby a negative spread as an additional source of operating losses. In

its more intense form, however, the money market freeze pushed riskier borrowers out of the market altogether, and this deprived them of the oxygen they needed to stay alive—they suffered a sort of death by asphyxiation. When troubled financial institutions suddenly found themselves shut out of the money markets, they had to liquidate their (better) assets at any price or go under. In addition to creating massive sell-off pressure on bond and stock markets and consequently sharply falling prices there, the panic in the money markets thus had the potential of pushing the more overextended banks, hedge funds, thrifts, and finance companies over the cliff. By early 2008 the crisis had become systemic.

Bear Raids

In March 2008 Bear Stearns, America's sixth-largest investment bank, collapsed. Like many of the subsequent bank failures, Bear Stearns was a second-tier institution trying to catch up to the market leaders with aggressive and innovative tactics that relied heavily on leverage and off-balance-sheet operations. This rapid-growth strategy worked very well during the boom years, but left those institutions (e.g., Lehman Brothers, Royal Bank of Scotland, Northern Rock, Fortis, IKB) extremely vulnerable to any downturn. Not only were they severely undercapitalized relative to their size and hence not in a position to take large losses, but they were also very dependent on continuous access to the money markets in their buildup of leverage. When the money markets stopped working smoothly in the wake of the ABCP panic, that group of overextended banks faced an especially dangerous combination of insolvency (i.e., depletion of their thin capital layer amidst excessive losses) and illiquidity (i.e., inability to access money markets). The highly leveraged Bear Stearns (with a leverage ratio peaking at 35.5:1) had become exposed to this double whammy early on, in July 2007, when two of its hedge funds with heavy exposure to CDOs collapsed—a blow from which the firm never managed to recover. It thus became the first of several large financial institutions facing a

devastating stock market attack in what famous speculator and inventor of hedge funds George Soros has characterized as *bear raids*.[17]

The decline of Bear Stearns' share prices, starting slowly in August 2007, took on a dizzying speed from late February 2008 onward and then turned into an avalanche-like phenomenon by early March 2008. While much of that price collapse came in response to the firm's genuine troubles with funding in the money markets, forced asset sales, and mounting losses, there were clearly other factors involved as well in this first massive bear raid. Of crucial importance in this context was the emergence of CDS as a measure of market sentiment about troubled financial institutions. As shareholders, short sellers, and other speculators began to weigh the prospects of Bear Stearns more negatively, its CDS premium shot up. Such an instant signaling device only reinforced market worries about the company's survival chances, accelerating share sell-offs. Since CDS could be bought and resold without owning the underlying reference security, speculators rushed into buying up CDS on Bear Stearns in the hope of gaining a profit from the rising CDS premiums. They were helped in that strategy by increasingly intense rumors concerning Bear Stearns' impending liquidity crunch whose impact on CDS premiums and short-selling reinforced the sell-off of Bear Stearns' shares even more. That negative feedback loop, establishing a deadly interaction between rising CDS premiums and falling share prices, became a self-fulfilling prophecy once Bear Stearns shares had fallen into the single digits. Rules governing institutional investors forbade mutual funds and pension funds to hold shares whose price was below $5 per share, thus establishing a threshold of death for failing financial institutions like Bear Stearns.[18]

When Bear Stearns finally reached that threshold on March 13, the Federal Reserve used its Section 13(3) emergency powers for the first time since the Great Depression to arrange for the company to be bought up by J. P. Morgan for $2 per share, giving the former Wall Street highflier a market capitalization that was less than the real estate value of the skyscraper serving

as its headquarters in midtown Manhattan. The Bush administration, concerned as all political conservatives with the moral hazard problem of government bailouts encouraging excessive risk taking, wanted to send a clear message that shareholders could be expected to be wiped out in any government-mediated rescue operation of institutions "too big to fail." Even though the Morgan takeover of Bear Stearns was subsequently repriced by the courts to a more reasonable $10 per share in response to investor lawsuits, that message surely sank in. Ironically, it convinced investors to jump off sinking ships faster and so had the perverse effect of making subsequent bear raids on other troubled financial institutions even more virulent.

There were many more spectacular failures in the six months following the Bear Stearns collapse. The nation's leading subprime lender Countrywide was sold to Bank of America in June 2008 while the FDIC seized the second-largest mortgage lender IndyMac a month later after an 11-day run on its bank deposits. Then, still in July 2008, both Fannie Mae and Freddie Mac were given special funding access by the US government having to make good on its implicit support promise, the first step in what ultimately ended up in early September 2008 as a quasi-nationalization of the two GSEs. Both entities had been obliged to step into the mortgage mess as lenders of last resort and so had accumulated a large amount of toxic assets from private lenders, a loss socialization effort that ultimately destroyed whatever little capital cushion they had left at the onset of the crisis. The cost of this de facto nationalization of the nation's second and third largest financial institutions respectively (based on asset size) came to an amazing $238 billion. Regarding the situation abroad, revelations of large losses in September 2007 triggered a classic bank run on Britain's mortgage lender Northern Rock, made worse by initial hesitation of the Bank of England to provide emergency support. The long lines of Northern Rock customers trying to withdraw their funds were reported worldwide, evoking already early on in the systemic crisis dramatic memories of the Great Depression. And the messy failures of Belgium's leading banks Fortis and Dexia in late September

2008 demonstrated how difficult it was for EU policy makers to coordinate their crisis management actions in a trans-European financial space.

The Lehman Debacle

While the six months following the collapse of Bear Stearns had been eventful, to say the least, nothing had prepared the world for the historic events of mid-September 2008. First, it was the turn of Merrill Lynch, America's second-largest investment bank, to need a bailout, which was arranged through a takeover by Bank of America.[19] By now it had become clear that the crisis would end up creating even more gigantic institutions "too big to fail" by forced mergers and so add to the already considerable concentration in banking. A couple of days later, the US government had to come up with $90 billion in a hurry to save American International Group (AIG), the world's largest insurance company, by taking a 80 percent majority stake in that company and providing it with emergency funds to make good on its commitments. AIG had gotten into trouble when its London-based subsidiary AIG Financial Products had decided to make a bundle from serving as counterparty to many of the synthetic CDO deals described above. When those fell apart, AIG suddenly faced gigantic payout commitments for which it had neither reserves nor capital set aside. Had AIG been let go under, it would have destroyed the insurer of last resort for the worldwide mortgage-securitization machine and so have had a devastating impact across all segments of global finance. And finally, the US government then also had to face the imminent collapse of Lehman Brothers, America's fifth-largest investment bank, which had been rumored to be in deep trouble ever since the Bear Stearns debacle six months earlier. This, as it turned out, was going to be the climax of the systemic banking crisis of 2008.

As the bear raid on Lehman gathered speed, the Bush administration had already become quite concerned that its numerous government-aided rescue operations during the preceding months

had aggravated the so-called moral hazard problem. According to that argument, banks were induced to take excessive risks to the extent that they had reason to expect a government bailout in case of failure. In the minds of bankers a high-risk strategy might very well pay off with commensurately better returns; if it did not, they would be aided by the government. Thus shielded from the pain of market failure, they could suspend any prudent weighing of risks and returns. The very disintegration of the securitization infrastructure had provided ample evidence that banks indeed were chasing high returns in a very irresponsible manner. When many of them ultimately ended up failing, they were simply "too big to fail" and so obliged the government to intervene. Under pressure from the conservative wing of the Republican Party and also facing mounting public anger about taxpayer bailouts of irresponsible bankers, Bush officials were eager to draw a line in the sand and use the impending failure of Lehman to teach the finance sector a lesson about the need for restoring market discipline. Officials were optimistic that any fallout from a Lehman bankruptcy would be limited, since investors had had nearly six months to prepare for such an eventuality. There were, to be sure, frantic last-minute negotiations to have Lehman acquired by Barclays, but the British bank could not secure shareholder and regulator approval in time. And so Lehman was let go under during the weekend of September 14.[20]

The collapse of Lehman Brothers, a company with $639 billion in assets at the time of its demise, was the largest bankruptcy in the history of the United States. Any corporate failure of that size was bound to have major repercussions for the domestic economy. But this was after all an investment bank, a financial institution deeply embedded in a complex web of affiliations and payment commitments across the globe to whose demise already jittery markets would surely react very strongly. The intertwined nature of modern finance is such that no one, neither banker nor politician, could foresee with any degree of accuracy what would happen when Lehman declared itself bankrupt.

In the immediate aftermath the public, as well as Bush administration officials, were distracted by the forced acquisition of

Merrill Lynch by Bank of America and the AIG rescue, which coincided with the Lehman collapse. There were even positive signs right from the beginning that the much-feared CDS payout commitments in the wake of Lehman's bankruptcy could be unwound in fairly orderly fashion (as ultimately transpired). But a couple of days later Reserve Primary Fund, the nation's oldest money market mutual fund (MMMF), announced unexpectedly large losses on its Lehman holdings that made it impossible to maintain its net asset value at the promised level of $ 1 per share. The public had come to regard uninsured MMMFs to be as trustworthy as insured banks precisely because of this supposedly ironclad dollar-per-share promise. When Reserve Primary Fund "broke the buck," there was an immediate run on MMMF, which in turn froze the world's money markets. What followed was an extremely severe credit crunch, which pushed the US economy into a free fall (with a depression-like decline of GDP (gross domestic product) at an annualized rate of minus 6.3 percent during the last quarter of 2008 and minus 6.1 percent in the first quarter of 2009). Since the United States had served until then as buyer of last resort for a large number of European and emerging market economies pursuing export-led growth strategies, its sudden and violent contraction had an immediate impact of pushing the rest of the world into a steep recession as well (with the volume of world trade contracting by 30 percent during the six months following the Lehman failure).

Countervailing Stabilization Policies

At that point the world faced for the first time in nearly 80 years the prospect of a synchronized depression. To understand the magnitude and impact of the post-Lehman shock to the system, it helps to keep in mind the following equation demonstrating the interaction of an economy's three sectorial (external, private sector, and public sector) macroeconomic balances:[21]

$$(X - M) = (S - I) + (T - G)$$

The shock triggered by the post-Lehman credit freeze triggered a most dramatic reversal of America's private sector balance ($S - I$) from minus 2.5 percent in mid-2007 to a positive 7.6 percent in May 2009. This massive shift came about due to a combination of sharply higher savings S by worried private actors obliged to meet high debt servicing charges without proper access to credit (reversing from minus 3.1 percent to a positive 6.9 percent) and a slashing of investment outlays I. A shift of that magnitude would have contracted total spending so much as to throw the US economy into a depression, were it not for compensating adjustments in the other sectors. While the United States halved its current account deficit (exports X minus imports M) from its prerecession deficit of minus 5.1 percent to minus 2.5 percent nine months later, most of the counteracting adjustment came from the public sector. The latter adjustment would have come about to some degree automatically due to recession-induced declines in tax revenues T and increases in income maintenance programs, which are part of government expenditures G (e.g., unemployment compensation, food stamps). But those so-called automatic fiscal stabilizers were not strong enough to counteract a private sector reversal of that magnitude. They had to be reinforced by discretionary government action, starting already in late September 2008 with the $700 billion Troubled Asset Relief Program (TARP). TARP was originally set up to help banks unload their toxic assets, but it was soon transformed into helping recapitalize the nation's largest banks and, under President Obama, rescue the US automobile industry. In addition, Obama launched a $787 billion stimulus package in February 2009, combining tax cuts, aid to troubled states, and job-creating investment programs (e.g., subsidies for the solar industry). As a result the US budget deficit moved from an annualized level of minus 2.4 percent of GDP in mid-2008 to minus 10 percent a year later, and this immediate net injection of spending compensated in large measure for the decline in private spending so that the economy of the United States could exit its post-Lehman downward spiral relatively quickly (by mid-2009).

Expansionary US fiscal policy was further reinforced by monetary policy efforts under Ben Bernanke. Not only did he slash the short-term interest rates under Fed control (discount rate, Federal funds rate) to just above zero, but the Fed introduced in short order a number of targeted credit-easing programs (e.g., Term Securities Lending Facility, Primary Dealer Credit Facility, Money Market Investor Funding Facility, Commercial Paper Funding Facility) each of which was designed to remove a specific clog in the American credit system and so revive the broken-down credit supply.[22] The US central bank also entered into a series of swap agreements with other central banks to help alleviate a global shortage of dollar reserves that had put enormous pressure on foreign banks facing dollar-denominated margin calls. And in late November 2008 the Fed launched the first of its so-called quantitative easing initiatives, engaging in massive bond purchases to pump additional reserves into the banking system while giving support to the damaged bond markets.

The worldwide impact of the post-Lehman shock was alleviated by concerted action on the part of many governments acting in unison. The key to this effort was the elevation of a hitherto marginal body, the Group of Twenty, to a global policy coordination mechanism. Bringing together the leaders of the 20 largest economies (with a combined 86 percent of the world's GDP), the now semi-annual G-20 meetings drew on a remarkable consensus from November 2008 onward to meet the challenges of a global crisis together. The G-20 leaders agreed in short order to rescue their respective banking systems, initiate reregulation of those systems, strengthen the intervention capacity of the International Monetary Fund, pass fiscal stimulus packages, accept the need for extraordinary monetary policy stimulation, and abstain from unilateral protectionism. This coordinated policy intervention was crucial in reversing the downward spiral, and by late 2009 the world economy began to show signs of sustainable recovery (except for the European Union where the impact of the subprime crisis would trigger its own systemic crisis of historic proportions).

There are some clear lessons to be learned from the story of the subprime crisis recounted here. One lesson is that major crises typically start as financial ones, often with the burst of a bubble. Another is that finance itself has today become something qualitatively new, an innovation-driven facilitator of funding whose largely unrestrained liberty of design by its main actors and their propensity for excess have both created strong ups and downs in the pattern of economic growth. Another quality of modern finance, a degree of interconnectedness beyond any single human's comprehension, has given this cyclical up-and-down dynamic a truly global dimension of contagion. Obviously, government policy has a large role to play in regulating finance and smoothing out the cycles, but this depends increasingly on how well national governments coordinate their responses to the transnational challenges of a fully globalized financial system. We shall analyze this dual challenge of global finance and cycle contagion systematically in subsequent chapters, starting with the notion of "structural crisis" in the next chapter.