Chapter 2

The Roots of the Great Recession

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The proximate cause of the "Great Recession" was the unraveling of the mortgage securitization industry beginning in 2007. What had been a relatively small niche market at the beginning of the 1990s was, from 1993 to 2007, transformed into the core activity of the rapidly expanding financial sector. At the peak of the mortgage business, in 2003, the financial sector, comprising about 10 percent of the labor force, was generating 40 percent of the profits in the American economy (Fligstein and Shin 2007; Krippner 2010). These profits were mostly being made from businesses engaged in selling mortgages and creating various forms of mortgage-backed securities and related financial products. In 2003, the mortgage business represented a $4 trillion industry. Beginning in late 2006 and early 2007, the housing and mortgage-backed securities markets began to collapse, taking the larger financial sector down with them by the end of 2008. That crisis threatened the existence of the entire banking system in America. As banks and other financial institutions panicked, the system of granting access to short- and long-term credit for both businesses and consumers appeared to seize up and threatened to shut the economy down. In response to this uncertainty, consumers and businesses stopped buying. This created a downward spiral in the economy, and the most severe crisis in American capitalism since 1929 rapidly took hold.

Our basic argument in this chapter is that the Great Recession happened because the growing American financial sector sought to base its business on selling risky mortgages to individuals. These mortgages were risky both because of the questionable creditworthiness of the borrowers to whom they were sold and because key features of the mortgages made them dependent on continued growth in housing prices (Mian and Sufi 2010; Bhardwaj and Sengupta 2009a; Demyanyk and Van Hemert 2009). Over $5.2 trillion worth of these "unconventional," subprime, Alt-A, and home equity loans were sold to residential borrowers in the United States between 2003 and 2007. Banks and other financial institutions made money from the fees generated by selling the mortgages, packaging them into bonds, and selling the bonds to investors. They also often retained a significant portion of the securities in order to profit from the lucrative spreads on high-yield bonds that could be funded through cheap capital in the period from 2001 to 2006. By aggressively pumping so much credit into housing markets, the banks helped fuel a housing price bubble on which the boom in mortgage-based securities in turn fed (Nadauld and Sherlund 2009). The bursting of this bubble after it peaked in late 2006 set off a wave of mortgage defaults that reverberated back through the mortgage industry and global financial markets.

The purpose of this book is to document the recession's wide-ranging effects in various spheres of social life. This chapter helps set the stage for that discussion by tracing the roots of the recession in developments within the mortgage-finance industry. We have two main aims. The first is to answer the question of what happened and how. We begin by recounting the key events and examining how a drop in housing prices could catalyze a wholesale implosion of the financial economy. We outline the sequencing of these events and connect them to the broader economic downturn they created. We then go back and document the history of how the mortgage finance industry expanded during the 1990s and how the character of this expansion fed the housing bubble that ultimately led to the near collapse of the economy.

The second aim is to explore some of the commonly voiced explanations for *why* the crisis happened. Was it a perfect storm that nobody could have seen coming? Or was it simply that the incentives in the securitization process were misaligned, such that mortgage originators and securitizers had little reason to care about borrowers' ability to repay, since they were passing the risk off onto others? To what extent can we see the crisis as a result of Wall Street's infatuation with mathematical models and securitization technologies whose complexity concealed risks and eventually outstripped the ability of people to understand them? We evaluate the strengths and limits of these explanations of the crisis in light of the evidence we will present. What we find is that

the most conventional explanations commonly heard in the media and in academic discussions fail. What becomes clear is that the mortgage industry had become a system that linked all of the financial institutions in the economy and made them dependent on the continued increase in U.S. housing prices. It was this dependency on the part of Wall Street and the rest of the banking system that eventually made the downfall seem so surprising. Most regulators never saw the crisis coming precisely because they did not see the interconnectedness of the different elements of the system. One could argue that this systemic understanding is still lacking.

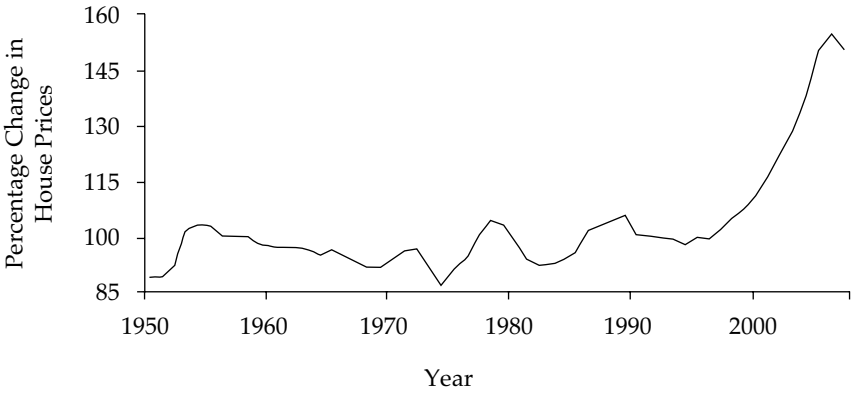
We concentrate here on the crisis in the United States; an analysis of how it played out around the world is beyond the scope of this chapter. Suffice it to say that the U.S. housing crash had both direct and indirect effects on the world economy (for some accounts of this see Rose and Siegel 2010; Claessens et al. 2010). Banks around the world held large volumes of mortgage-backed securities. Those banks experienced stress and many countries had some form of a banking crisis as a direct result of holding these dubious securities, but all in all, the indirect effects of the U.S. crisis were probably larger than the direct ones.[1] Here, we stick with what happened in the United States.

The Events of the Great Recession

What were some of the main events that marked the rise and fall of the mortgage sector and, with it, the economy? At the core of the crisis was the rapid increase in house prices that fueled the economy from 1997 to 2007 and then just as suddenly plunged. Figure 2.1 shows the unprecedented rise in house prices that accompanied the securitization craze. Throughout the postwar era house prices fluctuated around an inflation-adjusted constant. Indeed, housing prices on an adjusted-for-inflation scale remained more or less constant from 1950 to as late as 1997. Beginning in 1997, house prices rose dramatically, to peak in 2006 at nearly 160 percent of their long-run average.

In some parts of the country housing prices rose even more dramatically. Figure 2.2 presents data that show that the states of California, Nevada, Arizona, and Florida experienced price increases at or above the rate of 15 percent a year from 2004 to 2006. Beginning at the end of 2006, housing prices started to drop precipitously in those four states, and in 2008 the prices fell a whopping 25 percent. The rest of the country experienced some of the bubble, but nowhere as extremely as those four states. Housing prices also decreased in the rest of the country, but around 5 percent, not 25 percent. In the face of these price declines, foreclosure rates rose dramatically. Figure 2.2 shows that the states that saw the greatest appreciation in housing prices—California, Nevada, Ari-

Figure 2.1 Inflation-Adjusted National House Price Index (1995 = 100).

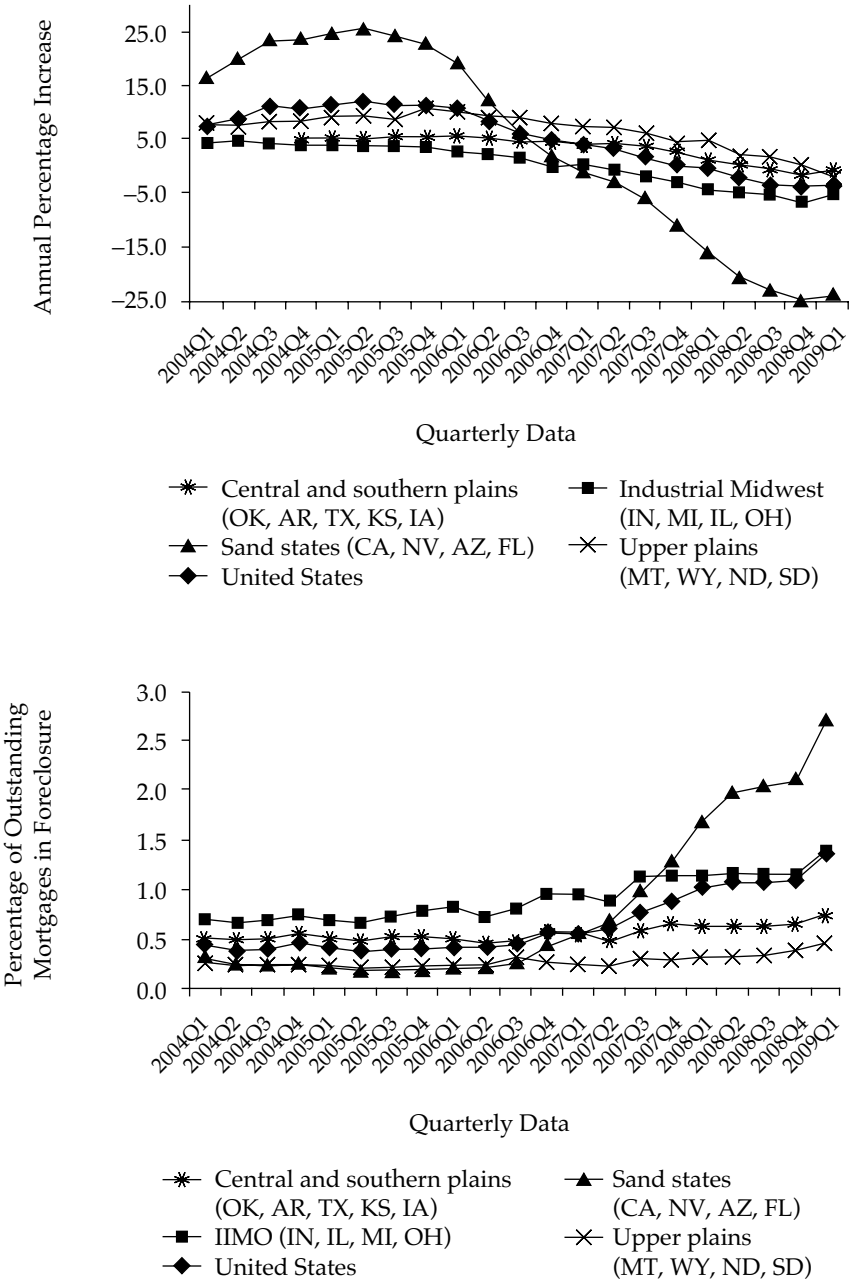


Source: Wilcox (2008).
Note: Prices are based on the Case-Shiller Home Value Index from 1950 to 1974 and the Office of Federal Enterprise Oversight (OFHEO) Index from 1975 to 2007. Prices are deflated using the Consumer Price Index.

zona, and Florida—had dramatic increases in rates of foreclosures. Foreclosure rates in those states went from less than 0.5 percent at the beginning of 2006 to almost 3 percent of all mortgages by 2008. Foreclosure rates increased across the country, but not as dramatically as in those four states.

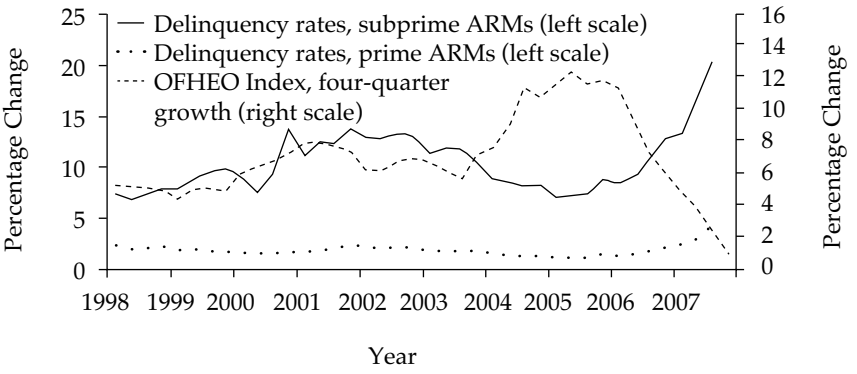
The increase and subsequent drop in housing prices might not have had such a large overall effect on the economy if it had not been for the way mortgages were being sold and financed in this period. Between 2003 and 2007, the number of mortgages issued that were subprime went from being about 30 percent to almost 70 percent of the total. These subprime mortgages were more likely to have adjustable rates that would reset to dramatically higher rates after twenty-four to thirty-six months. People who had such mortgages made it a practice to refinance their mortgages before these resets occurred, and they did so mainly on the basis of the appreciation in the value of their homes. But the appreciation in the value stopped and the values started to fall just as mortgage rates adjusted, and now people found themselves with unsustainably high payments for houses that were not worth as much as their mortgages (Bhardwaj and Sengupta 2009a, 2009b). Figure 2.3 captures this dynamic by comparing the rates of adjustable-rate mortgages either in arrears or in default alongside an index of the increase in housing prices. Subprime adjustable-rate mortgages had relatively high default rates of around 8 to 10 percent. In 2006, when the appreciation in

Figure 2.2 Housing Price Appreciation and Foreclosures, by Region



Source: U.S. Department of Housing and Urban Development (2009).
Note: Housing price changes are based on averages of Federal Housing Finance Agency's state-level price indices. Mortgage foreclosure rates are based on the Mortgage Bankers Association's widely used delinquency survey (2010).

Figure 2.3 Mortgage Delinquency Rates (left scale) and House Price Appreciation (right scale)

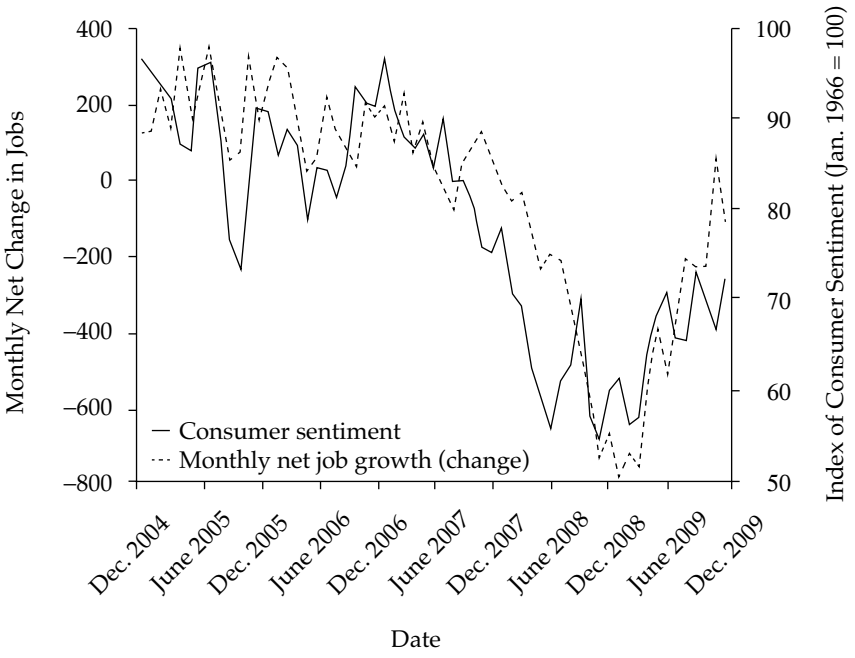


Source: Furlong (2008).
Note: Delinquency rates here combine mortgages two months and more delinquent and mortgages in foreclosure.
ARM = adjustable-rate mortgage
OFHEO = Office of Federal Enterprise Oversight

house prices slowed dramatically, the default rates skyrocketed to over 20 percent.

Banks who were heavily exposed to mortgage-backed securities based on subprime mortgages came under financial pressure beginning in the spring of 2007. New Century Financial, the largest subprime lender in the country, filed for bankruptcy on April 2, 2007. Over the next year the Federal Reserve began to intervene in the market to help banks refund and reorganize themselves. In the spring of 2008, the investment bank Bear Stearns was forced into a merger with JP Morgan. The financial crisis accelerated in the summer of 2008. IndyMac, one of the largest savings and loans banks, went bankrupt in July, and the federal government took over the two government-sponsored housing enterprises, Freddie Mac and Fannie Mae, in August. Instead of calming the markets, events accelerated in September with Bank of America's purchase of Merrill Lynch and Wells Fargo's of Wachovia, and of course, the collapse of Lehman Brothers on September 15, 2008. The federal government began to support AIG on September 17, 2008. As the crisis gathered momentum, the federal government undertook a set of dramatic moves, including passing the legislation known as the TARP (Troubled Asset Relief Program), which authorized the use of $700 billion to help resolve the crisis. In late 2008, both the automobile and large insurance companies requested access to the TARP money, and eventually many of these companies were granted monies.

Figure 2.4 Recession Indicators: Monthly Net Job Growth and Consumer Confidence



Source: Authors' compilation based on data from U.S. Bureau of Labor Statistics (2010) and University of Michigan (2010).

Of course losses were not confined to investors and the large banks that had caused the meltdown. Even before the historic implosion and hasty bailout of the financial system in September 2008, the rising tide of foreclosures and financial-sector losses was beginning to put downward pressure on the real economy. The severity of the resulting recession reflected the fact that it was not a typical business cycle downturn but a major crisis in an economy that had become increasingly centered on financial markets. According to the National Bureau of Economic Research's Business Cycle Dating Committee, the recession officially began in December 2007, midway through the financial meltdown.

Figure 2.4 displays two indicators of the downturn's reverberation through the real economy: consumer sentiment and job losses. The darker line plotted on the right axis shows the index of consumer sentiment, which is based on a monthly survey and often viewed as a leading indicator that presages more systemic economic trends. The index peaked in July of 2007 and began a steady freefall thereafter. By the summer of 2008 it had reached its lowest level in twenty-eight years. The lighter line shows that the economy began shedding jobs six months

later, in January 2008. The rate of job losses accelerated throughout the next year. All told, the economy lost a net total of over 4.3 million jobs in 2008 and 2009. The worst months were between November 2008 and March 2009, when 700,000 to 800,000 jobs were lost each month; the bleeding continued at a slower rate through the rest of 2009. Despite a highly touted job turnaround, only 4 percent of total losses from the recession had been regained during the first quarter of 2010 (U.S. Bureau of Labor Statistics 2010). In response to this growing crisis, the Dow Jones Industrial Average peaked at 14,164 on October 9, 2007, and it reached its low point of 6,547 on March 9, 2010, a decline of 53 percent. In the midst of this crisis, on February 17, 2009, President Barack Obama got the Congress to pass a $987 billion stimulus package.

The economic crisis remained even more persistent in the housing sphere. Mounting job losses and waves of distressed home sales in 2008 put continued negative pressure on housing prices. By the end of 2009 national composite price indices had fallen 29 percent from their May 2006 high. In some bubble areas such as Las Vegas and Phoenix, house prices were less than 50 percent of what they had been at the peak of the bubble. The continued drop in prices spread the foreclosure crisis well beyond the subprime borrowers who were its initial victims. Many homeowners with conventional mortgages found their houses worth less than what they owed on them. If they should be unable to pay their mortgages because of unemployment, they would be inclined to walk away from their homes. As of the end of 2009, the combined percentage of outstanding mortgages that were either delinquent or in foreclosure exceeded 15 percent, which was an all-time high (Mortgage Bankers Association 2010). Over 40 percent of subprime loans were over three months delinquent. Furthermore, an additional 11.3 million households owed more on their mortgages than the value of the properties, a situation referred to as an underwater mortgage. This amounted to over 24 percent of all outstanding mortgages. In Arizona and Florida over 50 percent of mortgages were underwater, and in Nevada an astonishing 70 percent or more were underwater (First American CoreLogic 2010). Negative equity tends to be associated with heightened likelihood of default and foreclosure. Yet policy initiatives to staunch the rising tide of foreclosures have had minimal success. The most up-to-date data as of this writing come from the widely reported RealtyTrac, which shows that the number of homes foreclosed by banks increased 7 percent during the first quarter of 2010 to reach an all-time high ("Foreclosure Activity Increases 7 Percent in First Quarter," RealtyTrac, press release, April 14, 2010). Such data dim any hopes that the fallout of the crisis will soon subside without more aggressive governmental actions to force lenders into renegotiating mortgage terms.

Mortgage Finance and the Financial Meltdown: What Happened?

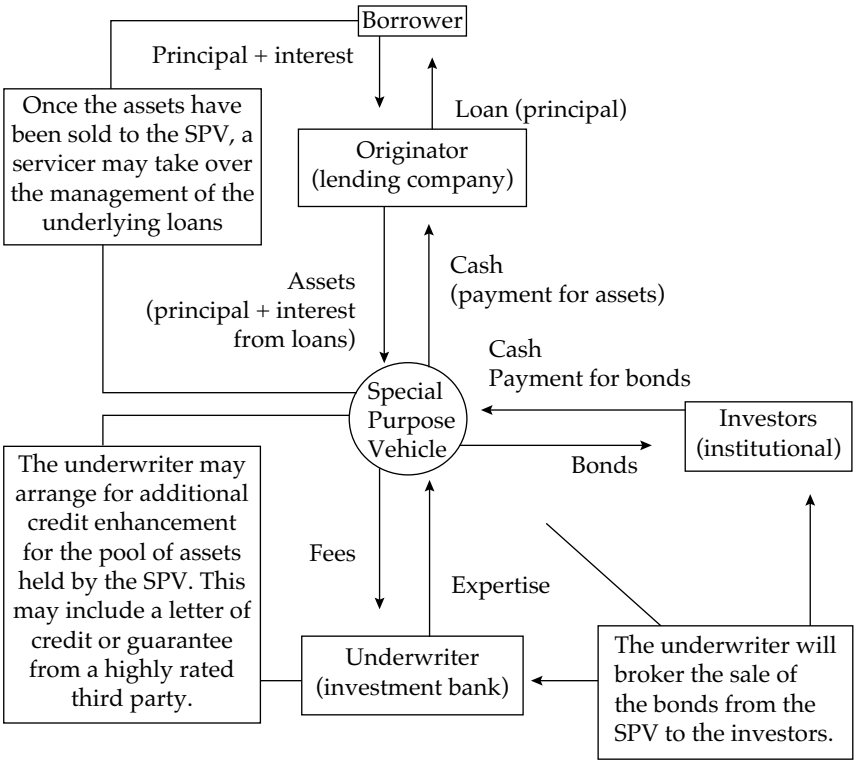
The "facts" of the Great Recession are quite daunting. The depth and rapidity of the decline is astounding. But, these events also spur us to wonder why this happened. How did housing become so important to the American economy? Why did the trading of mortgage-backed securities become such a fundamental business in the United States? Why did the market for subprime mortgages expand so quickly, and how did their decline come to be able to bring down the entire system of finance? Finally, how did mortgage finance come to be so intimately connected to the overall health of the American economy to such a degree that its decline cascaded through all of American business? To understand how a decline in house prices could catalyze a national and then a worldwide recession, it is necessary to understand the profound transformations in the structure, size, and significance of the housing finance sector in the United States during the previous three decades.

Background and Structure of Mortgage Securitization

The mechanics of mortgage finance remained relatively simple through the 1980s. Individuals would find a house to buy. They would go to their local bank (most likely a savings and loan association) and apply for a mortgage. The bank would agree to lend the funds and then hold on to the mortgage until it was paid off or the house was sold. Mortgages were geographically dispersed and held by local banks. This system was upheld by a set of regulatory laws that protected local savings associations from competition and treated them as socially beneficial instruments for promoting the American dream of home ownership.

Now, this scenario has changed markedly. After mortgages are issued, they migrate to a few square miles of Manhattan where in the offices of the major banks and government-sponsored enterprises (GSEs) such as Fannie Mae or Freddie Mac, the mortgages are packaged into bonds called mortgage-backed securities. These securities can be bought and sold on the market by investors and are sold and resold to investors all over the world. Figure 2.5 describes the way the mortgage industry was organized by the 1990s. Here, the borrower goes to a lending company (frequently but not necessarily a bank), which now is called an "originator" of a mortgage because it makes the initial loan. Unlike the original savings and loans banks, these companies do not want to hold on to the mortgages they sell but instead want to sell them off to others. Their

Figure 2.5 A Mortgage Securitization Package



Source: Authors' adaptation of Kendall (1996, 3).

business basically is organized to make fees as an intermediary broker, not, as an old-fashioned banker would, by collecting a modest interest on the mortgage. Instead, they sell the mortgages, thus recapturing their capital so they have the money they need to move back into the market by making further loans. If they were to hold on to the mortgages, they would be unable to lend money again and generate more fees.

The mortgages are bought by the GSE or private banks, who "package" them into a type of bond called a "special-purpose vehicle." By being packaged into this "vehicle" the pools of mortgages are transformed into an asset that pays a fixed rate of return generated from income streams on the underlying mortgages. These bonds are then rated by bond-rating agencies in terms of their riskiness and sold by investment banks to various classes of investors. Once issued, mortgage-backed securities are managed by trustees, who perform administrative

tasks, and servicers, who collect the monthly mortgage payments and disburse them to the bond holder in return for a fee.

There are several ways the issues of a mortgage-backed security (sometimes shortened to MBS) can structure the securities, which over time became more varied and complex. By the 2000s most MBS deals were divided up into risk-stratified securities called "tranches." Although backed by common pools of mortgages, the various tranches provide different risk profiles. In this way investors can buy riskier bonds that pay a higher rate of return but are the first to default in the event of losses, or they can buy less risky bonds that pay a lower rate of return. The rationale for these securities is that they could be engineered to manage risk; even though there is always a chance that an individual borrower might default on his or her mortgage, pooling and packaging of mortgage debt meant that investment banks and other issuers could create supposedly safe AAA-ranked securities from risky mortgage debts. These MBS packages that were divided up into tranches were called collateralized debt obligations, or CDOs.

Pricing a CDO can be a complex process because of the disparate income streams from which it is constituted, yet in essence a CDO is simple: a claim on income from mortgage payments made by homebuyers. By the middle of 2007, there was between $6.7 trillion and $9.1 trillion in outstanding bonds and derivatives backed by American mortgages (Inside Mortgage Finance 2009; Securities Industry and Financial Markets Association 2010). Banks and other financial institutions, mostly on Wall Street, began to construct new forms of derivatives based on existing CDOs called synthetic CDOs (Tett 2009). Housing finance had not only become an enormously complex enterprise, it had taken up residence at the epicenter of the nation's, and the world's, financial structure.

How did we move from a world where the local buyer went to her sleepy local bank to get a loan to one where most of the mortgages in the country are now packaged into mortgage-backed securities and are sold into a broad national and international market? It will surprise most readers that the origins of the mortgage-backed security and the complex financial structure depicted in figure 2.5 were not invented by the financial wizards of Wall Street but instead were invented by the federal government. The mortgage-backed security had its genesis in an off-balance-sheet accounting maneuver: During the 1960s federal officials were interested in expanding home ownership as part of President Lyndon B. Johnson's Great Society agenda. They wanted to find a way for the federal government to help pump credit into mortgage finance. But they were also worried about the size of the budget deficit. Because of the Vietnam War and the recent expansion of Medicaid, Medicare, and other social benefits, the government was running large and persistent debts. An expensive housing program where the government provided

funds for mortgages would add to the deficit, because the government would have to borrow money for the mortgages and hold those mortgages for up to thirty years.

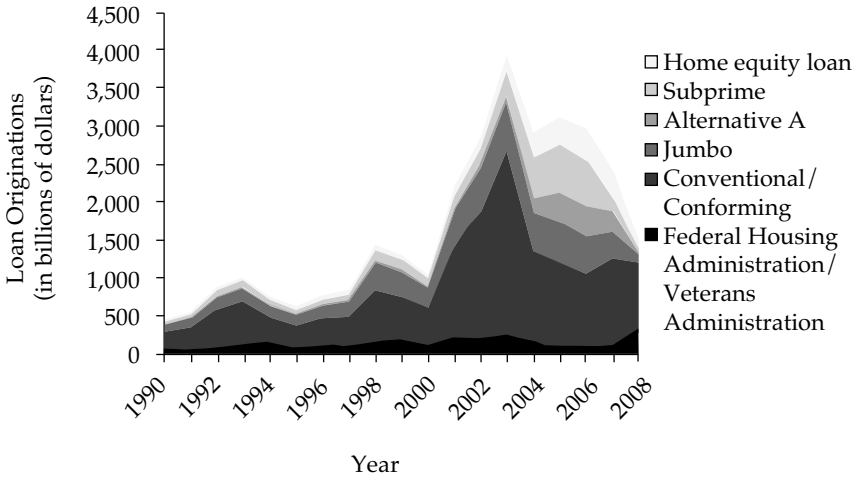
To overcome this problem the government created the quasi-public GSEs Fannie Mae, Freddie Mac, and Ginnie Mae to issue mortgage-backed securities and insure them (Sellon and VanNahmen 1988; Quinn 2008).[2] The GSEs would take conventional mortgages—mortgages where the buyer would put 20 percent down and pay a fixed interest rate for thirty years—and package them into mortgage-backed securities. The first mortgage-backed security was issued on April 24, 1970, by Ginnie Mae ("Ginnie Mae Offers First Mortgage Backed Bond," *Wall Street Journal*, April 24, 1970). By turning mortgage debt into bonds and selling them to investors, the GSEs could recirculate the proceeds back into the mortgage markets and thus maximize the availability of funds to lend and thus of credit. And by insuring these so-called "agency-backed" bonds against default, the government could encourage private capital to purchase them (Barmat 1990).

The Housing Boom and the Securitization of Subprime Mortgages

Mortgage securitization grew slowly during the 1970s. Part of the problem was regulatory in nature. In order for many investors to hold mortgage-backed securities, the tax status of such bonds needed to be dealt with. The 1986 tax reform legislation, which was written by Louis Ranieri of the Wall Street investment bank Salomon Brothers and was supported by the GSEs, allowed many new investors to enter the market (Nocero and McLean 2010). The financial crisis of the savings and loans banks during the mid-1980s caused them to sell hundreds of millions of dollars worth of mortgages to investment banks for packaging into mortgage-backed securities (Lewis 1989). Salomon Brothers grew rich and expanded on the business. The GSEs took over from the savings and loans the main role of mortgage provider in the economy (Fligstein and Goldstein 2010). They also operated as the ultimate guarantor of mortgage-backed securities.

By the early 1990s, investment bankers came to see that mortgages could be a profit center for them; the loans could be packaged and sold as bonds just like their corporate and government bonds (Jungman 1996). The potential size of these markets was huge. The market for mortgages in the United States increased from $458 billion in 1990 to nearly $4 trillion at its peak in 2003. Most of these mortgages were packaged into mortgage-based securities, and although most of them were still sponsored by the GSEs, commercial or investment banks played an

Figure 2.6 Residential Mortgage Origination in the United States by Type, 1990 to 2008



Source: Authors' calculations based on data from Inside Mortgage Finance (2009).

increasingly prominent role in putting these packages together and helping the government to sell them.

Then a new twist came along: subprime and other unconventional mortgages. The nonconventional mortgage market contained a number of products that allowed people with less-than-perfect credit or who needed help in qualifying for loans to get mortgages. Such mortgages included those that required less than 20 percent down payment, had variable interest rates, or had different term lengths. Because of regulatory restrictions, the GSEs could not enter the subprime market. That market started small, but after 2003 the big private banks created a massive market segment for those unconventional mortgages that the GSEs could not back.

It is useful to document the growth of the mortgage origination market since the early 1990s. Figure 2.6 presents data on total loan originations from 1990 to 2008 and breaks down the loan types into various products. The American mortgage market was about $500 billion in 1990. In the course of the 1990s it went up to nearly $1 trillion, in 1993, and peaked at around $1.5 trillion, in 1998. In 2000, it stood at $1 trillion. The real surge in the mortgage market began in 2001 (the year of the stock market crash). From 2000 to 2003, residential originations in the United States climbed from about $1 trillion to almost $4 trillion. About

70 percent of this rise was accounted for by people refinancing their conventional mortgages at lower interest rates.

One much-discussed set of factors behind the housing credit boom was low interest rates in the United States coupled with a glut of capital savings around the world in search of safe yet high-yielding assets. The availability of cheap, plentiful capital was an important macro-economic background condition of the housing bubble. The other major factor in the housing boom was the proliferation of mortgage securitization tools and the increased participation of the bigger banks in these processes. The large banks entered these markets with the goal of growing them and growing their market share in them. Table 2.1 shows how the top players in various parts of the mortgage market changed over time as those markets grew. It shows that in 1996, the largest players in the mortgage market were mostly either mortgage-lending specialists such Countrywide or NW Mortgage or regional commercial banks such as Fleet Financial or PNC. But by the end of the bubble in 2007, the identities of the largest loan originators had changed. Now the largest mortgage originators were the large national bank holding companies such as Wells Fargo, Citibank, and Bank of America. Countrywide had turned itself into a national bank, as had Chase, Wachovia, and Washington Mutual. These large players grew larger as the national market expanded.

The table also shows a similar process for the packagers of mortgage-backed securities—in the industry jargon these packagers are often called conduits. In 1996, two large firms, Salomon Brothers (now part of Citibank) and Merrill Lynch, were on the list of packagers, but aside from these, the packagers of MBSs were generally smaller firms that tended to be focused on the mortgage market, rather than investment banks. By 2007, the list of MBS conduits is dominated by investment banks: Lehman Brothers, Bear Stearns, JP Morgan, Morgan Stanley, Deutsche Bank, and Merrill Lynch. Several of the largest originators of mortgages—Countrywide, Washington Mutual, IndyMac, and Wells Fargo—had taken advantage of deregulatory changes in the Glass-Steagall Act, passed during the Bill Clinton administration, that allowed them to move into the investment banking business. Now they not only make mortgage loans but also act as packagers of those loans into mortgage-backed securities.

The table highlights not only the shifting composition of the group of dominant players in the mortgage-finance field but also the increasing concentration of the whole field. The market share of the top five originators stood at 16.3 percent in 1996, a remarkably low concentration ratio, whereas in 2007 the top five originators accounted for 52.5 percent of a much larger market. Table 2.1 shows a similar process of concentration for the conduit market. In 1996, the top five packagers of mortgage-

Table 2.1 Dominant Firms in Selected Mortgage Finance Segments, 1996 and 2007

Top Overall Mortgage Originators and Their Market Share

1996		2007	
Norwest	6.6	Countrywide Financial	16.8
Countrywide	4.9	Wells Fargo	11.2
Chase	4.3	Chase	8.6
Fleet Financial	2.3	Citibank	8.1
Bank America	2.0	Bank of America	7.8
NationsBank	1.5	Washington Mutual	5.7
WaMu	1.4	Wachovia	4.0
Standard Federal	1.3	IndyMac	3.9
FT Mortgage	1.3	Residential Capital	3.2

Top Subprime Originators and Their Market Share

1996		2007	
Associates Capital	7.0	Citibank	10.2
Money Store	4.3	Household Finance	9.3
ContiMortgage	3.5	Countrywide	8.8
Beneficial Mortgage	2.8	Wells Fargo	8.0
Household Finance	2.6	1st Franklin	7.0
United Co.	2.3	Chase	6.0
Long Beach Mortgage	2.2	Option 1	5.8
Equicredit	2.1	EMC	4.1
Aames Capital	2.0	Ameriquest	3.3

Top Nonagency Mortgage-Backed Securities Issuers and Their Market Share

1996		2007	
GE Capital	8.4	Countrywide	13.6
Independent National	5.0	Wells Fargo	7.8
NW Assets	4.5	Lehman Brothers	7.1
Merit	3.6	Bear Stearns	6.8
Prudential	3.3	Washington Mutual	5.7
Salomon Bros.	3.3	JP Morgan	5.7
Merrill Lynch	3.1	Merrill Lynch	5.6
Donaldson et al.	2.0	Morgan Stanley	4.8
Structural Assets	2.0	Deutsche Bank	4.4

Top Subprime Mortgage-Backed Securities Issuers and Their Market Share

1996		2007	
Money Store	10.3	Merrill Lynch	10.1
United Co.	6.4	Countrywide	7.9
ContiMortgage	5.3	Morgan Stanley	7.8
Beneficial	5.0	Lehman Brothers	5.5
AMRESO	4.5	Bear Stearns	4.3
Aames	4.3	Barclays	3.4
Household Finance	4.2	Citibank	3.3
Residential Finance	4.2	Deutsche Bank	3.2
Associates Mutual	4.1	Washington Mutual	2.7

Source: Authors' calculations based on data from Inside Mortgage Finance (2009).

backed securities held a 24.5 percent market share, whereas in 2007 this rose to 41 percent. The top ten conduits' market share in 2007 was 71 percent. So in addition to a rapid growth in the size of these markets, there was also a rapid concentration of activities in a fewer larger and more nationally oriented banks. The significance of these trends is that the dynamics of mortgage-finance markets increasingly became a function of the strategies that these few leading firms pursued.

After 2003, the major banks' strategies pointed increasingly toward subprime and other nonconventional segments of the mortgage market. Figure 2.6 highlights the remarkable degree and rapidity with which firms gravitated toward nonprime lending (we discuss the reasons for this shift in a later section). The growth of this multi-trillion-dollar shoulder on the upper-right part of the graph would prove pivotal in unleashing the meltdown. It is useful to discuss the components of figure 2.6 in greater detail in order to fully understand the implications of this transformation of the mortgage market. At the bottom of the graph are home loans originated by the Federal Housing Administration and the Veterans Administration. These were never a large portion of the total originated loans, although the segment did increase slightly after 2001. The largest components of the market were conventional, or "conforming," mortgages: prime fixed-rate mortgages for people who made down payments of 20 percent of the sale price for their houses and whose loan values did not exceed the size limitations imposed by the government for inclusion in GSE loan pools. The loans were generally securitized into low-risk agency-backed mortgage-backed securities, which were insured against default and thus paid relatively lower rates of return. We can see that the bulk of the mortgage market from 1990 until 2003 consisted of these two categories of loans.

Beginning in 2003, however, we begin to see a rapid shift toward nonconventional loans. In contrast to conventional loans, securitization of most nonconventional mortgages was done by private-sector banks rather than GSEs. The term "jumbo loans" refers to loans that exceed government-set size limits and hence are not eligible to be in GSE pools. Jumbos are used to purchase expensive real estate, and many but not all are sold to affluent persons with strong credit. Home-equity loans are loans secured by the value of the equity in a house. These were frequently in the form of a line of credit or a second mortgage and were usually sold to persons who had equity but required additional income. Predatory origination practices were especially prevalent within the home-equity loan segment. Alt-A and subprime mortgages (sometimes called "B/C" mortgages to denote their lower credit quality) were sold to people with impaired credit history, or people who lacked the ability to make a large down payment, or people who did not have verification of their income. Alt-A is not strictly defined but is generally viewed as an

intermediate category that encompasses borrowers whose credit scores would qualify them for a prime mortgage but may not fully qualify them for a conventional mortgage. The term "subprime" actually has a set of formal definitions. To qualify for a prime or conventional mortgage, a person needed 20 percent down and a credit FICO score of 660 or above (the average score is 710 on a scale from 450 to 900). Mortgagees who did not have these qualifications were not eligible for prime or conventional mortgages.

What constituted impaired credit? Some of the conditions that could qualify a mortgagee as a candidate for a subprime mortgage were as follows: two or more late payments in the previous twelve months; one or more sixty-day payment delinquencies in the previous twenty-four months; a judgment, foreclosure, or repossession in the prior twenty-four months; bankruptcy in the previous five years; a FICO score less than 660; and debt-service-to-income ratio of 40 percent or greater (in other words, monthly loan payments totally more than 40 percent of the gross income of the household).

In 2004, for the first time, loan to borrowers who fell into nonconventional mortgages exceeded the number of borrowers in the prime market or conventional market. In 2001, the largest conventional (prime, government-insured) loan originator did 91 percent of its origination business in the conventional market and only 9 percent in the nonconventional market. By 2005 the largest conventional originator was doing less than half of its origination business within the conventional sector (Inside Mortgage Finance 2009). At the peak of the mortgage craze, in 2006, fully 70 percent of all loans made were unconventional mortgages. Thus, in a very short period of time banks reoriented housing finance—one of the largest industries in the economy—around securitizations of highly risky loans. This astounding change in the character of the mortgage market was noticed by regulators and Congress, but the Federal Reserve chose to ignore what was going on. Former Federal Reserve Chairman Alan Greenspan famously testified before Congress in October 2008 that the reason he did nothing to stop this rapid growth in unconventional mortgages was that he believed banks would not have made these loans if they thought they were too risky (Edmund L. Andrews, "Greenspan Concedes Error on Regulation," *New York Times*, October 24, 2008, p. B1).

There were two main reasons banks pursued these risky subprime loans so aggressively. First, there were fewer and fewer loans left to sell in the saturated prime market. Almost everyone who wanted to refinance their house had done so by 2003, and in order to keep their businesses going, banks and other financial institutions needed to find a new source of mortgages. Second, subprime origination and securitization turned out to be enormously profitable. According to a study by the con-

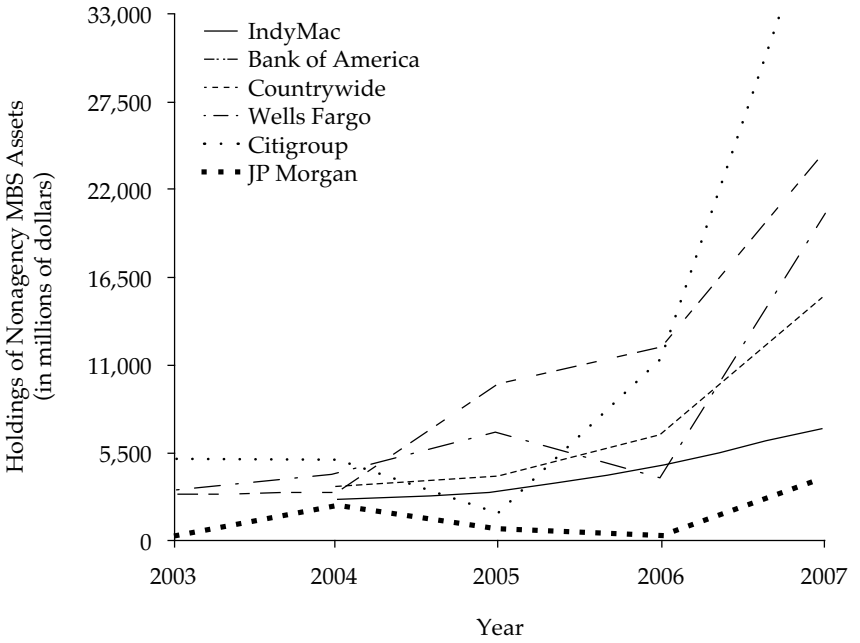
sulting firm Mercer Oliver Wyman, nonconventional lending accounted for approximately half of originations in 2005 but over 85 percent of profits ("Taking It Seriously," *National Mortgage News*, March 21, 2005, p. 4). Once lenders figured this out they often tried to sell subprime loans even to persons who qualified for cheaper prime loans. The repackaging of nonconventional mortgages into bonds also became the largest fee-generating business for many investment banks, including Lehman Brothers, Bear Stearns, Merrill Lynch, Morgan Stanley, and Goldman Sachs. Commercial banks and bank holding companies such as Bank of America, Wells Fargo, Citibank, and Countrywide Financial also became deeply involved in all stages of the market, from origination to packaging to servicing loans.

The major firms employed strategies to profit from mortgage-backed securities in multiple ways simultaneously, earning money both from fees and from income on retained MBS assets. Bank originators could use either their own capital or cheap borrowed capital to make loans to home buyers (Ashcroft and Scheuermann 2008 take up this story). Then, they could turn around and sell those loans to conduits. If they used someone else's money (borrowed at, say, 1 or 2 percent interest), then they could essentially do the entire transaction with very low cost and relatively high fees. Conduit banks could also borrow money cheaply. They would buy up the mortgages with cheap money, package them, and sell them to investors.

Beginning sometime around 2002, both commercial and investment banks began to realize that they could borrow money at 1 to 2 percent interest, create mortgage-backed securities, and then hold on to them—these securities might pay as much as 6 to 7 percent in interest. This allowed the banks to make a profit using other people's money and without risking their own capital. The low interest rates in the United States and the world encouraged banks of all kinds to borrow as much as they could to make as many subprime loans as they could, earn fees from packaging them into mortgage-backed securities, and then also hold on to a portion of the securities as investments. The massive amounts of money banks borrowed to fund this strategy are the reason they were so highly leveraged when the liquidity crisis hit in 2008.

Figure 2.7 shows holdings of unconventional-mortgage-related security assets for several major banks and thrifts. Unlike data of investment banks and private mortgage companies, firm-level data on holdings of commercial bank and thrifts are publicly available. Each of the firms shown in the figure was among the top fifteen private-label issuers of mortgage-backed securities at the peak of the market. Each was also among the top fifteen subprime originators (Inside Mortgage Finance 2009). Several things are worth noting here. First, the graph shows that the firms issuing mortgage-backed securities were holding on to a sig-

Figure 2.7 Nonagency Mortgage-Backed Securities Holdings of Selected Issuers



Source: Authors' calculations based on data from Inside Mortgage Finance (2009).

nificant portion of the bonds. Second, they were rapidly increasing their positions even as the bubble grew. IndyMac, which shows the lowest increase on the graph, actually increased its holdings by over 50 percent per year on average during this period. Citibank increased its MBS holdings by almost 400 percent, to $41 billion, during 2007. The company subsequently took a $35 billion loss on these assets. Although consistent company-level data for investment banks are not available, the same pattern of growth is evident among them. As a group they increased their nonconventional-mortgage holdings from $5 billion in 2002, to $60 billion in 2005, to $180 billion by June 2008 (Inside Mortgage Finance 2009).

The Housing Bubble

The massive growth of unconventional-mortgage securitizations fueled and fed on an unprecedented housing price bubble during this period.

The year 2000 will be remembered as the year of the crash in "dot-com" stocks. As that crash began, the Federal Reserve, to make sure that there was substantial credit in the economy and that lending would continue, essentially lowered interest rates to zero. Their actions were met by similar actions in central banks around the world. But there was an unintended effect of lowering interest rates so far: it encouraged the housing bubble in the United States. The rapid expansion of that bubble was astonishing: mortgage origination rose 400 percent in four years, and prices followed a similar pattern. That the Federal Reserve knew this and did not take any actions to stop it is one of the critical facts to be explained. Alan Greenspan has testified that he did not believe this was a bubble because housing prices are a local affair in the United States—a house in Boston is not the same as a house in Phoenix. In fact, quite a few markets—Atlanta and Denver are two of them—experienced population increases without housing bubbles.

But Greenspan chose to ignore the role of securitization in creating causally linked bubbles in many markets. A good deal of research suggests that the low interest rates across the country and strong demand from investors in the mortgage-backed securities market encouraged banks to pump as much credit into housing markets as they could (Mian and Sufi 2010; Herbert and Apgar 2010). Bankers could borrow money at around 1 percent interest and lend it at 5 to 7 percent. Where housing was scarce and population was growing, prices rose, encouraging banks to focus on those markets. This in turn encouraged further price increases, as borrowers could use access to plentiful credit to bid up prices. In 2004, the investment banks convinced the Security and Exchange Commission (SEC) to allow them to increase their ability to borrow money against their capital reserves. This allowed them to buy securities worth as much as forty times those reserves. As a result, they dramatically increased the amount of subprime credit being pumped into zip codes where housing prices were rising (Nadauld and Sherlund 2009).

Part of the reason banks focused on these markets was that the upward price trends fit the models used by the banks and credit ratings agencies to gauge default risks (Demyanyk and Van Hemert 2009). MBS issuers could attain safer credit ratings for securities by including in them a larger proportion of mortgages from zip codes with high price appreciation, since these were thought to be less prone to default. Subprime securitization thereby fed itself forward in the aggregate as the aggressive provision of credit in selected markets helped further inflate prices. All of the top thirteen subprime metropolitan statistical areas (MSAs) by this metric were located in the boom states of Arizona, California, Florida, and Nevada. Housing markets in these states effectively became linked through the common strategies banks adopted toward them. It is not surprising, then, that Arizona, Florida, Nevada, and parts

of California turned out to be ground zero of the subprime lending boom, the housing price bubble, and the subsequent foreclosure crisis.

The Bubble Pops and Defaults Increase

The meltdown was precipitated by the bursting of the securitization-fueled housing bubble. Slowing house appreciation led to rising mortgage defaults, which in turn led to far larger than expected losses on mortgage-backed securities (Mayer, Pence, and Sherlund 2009). The stall in housing prices activated all the latent risks of subprime lending that the persistent rise had repressed. We have already detailed the link between the peaking of the housing bubble and the rise in defaults as well as its pattern of regional concentration. We have also shown how defaults were concentrated within the subprime segment, which had grown rapidly from 2003 to 2007.

The more fundamental reason subprime mortgages were at the epicenter of the rising defaults in 2007 was that their basic design was predicated on a housing bubble. Traditionally the rationale for subprime loans was that borrowers with impaired credit could get a loan at a relatively high rate for a few years, build their credit with steady payments, and then refinance at a better rate. In other words, it was risk-based pricing for under-served borrowers who needed credit but were considered risky by financial institutions. But as the bubble grew, the underlying logic and structure of subprime loans became less about building borrowers' creditworthiness and more about making speculative bets on the housing market (Gorton 2008; Davis 2009). One of the underexplored issues of the financial crisis is: Exactly who was taking out subprime mortgages? We know that some of these borrowers had little income and no money for a down payment (Bhardwaj and Sengupta 2009b). Some were real estate speculators. And some were middle-class families who found themselves priced out of conventional mortgages because of rapid price increases in housing.

The shift into subprime mortgages led to increasing use of hybrid adjustable-rate mortgages (ARMs), which were mortgages that started at a low rate for a fixed period of time but then adjusted to a higher rate (Mayer, Pence, and Sherlund 2009, 31). Hybrid ARMs became popular because lenders could sell more loans by charging less interest initially—a predatory marketing ploy. But two-year "teaser" rates on ARMs were not simply a predatory marketing ploy to draw uncanny consumers and then lock them into high rates. Lenders were betting that house prices would continue to rise in the short term, offsetting other credit risks and justifying a somewhat lower initial interest rate. Borrowers could then refinance using quickly accumulated home equity before the mortgage reset to the higher adjustable rate. This incentive to refinance every two

years is why approximately two-thirds of subprime originations from 2000 to 2006 were refinances rather than new purchases.

Once housing prices stopped appreciating, however, the design of subprime loans made them especially prone to default. Borrowers who had been promised that they would be able to refinance in two years suddenly found it much more difficult to do so once the downturn spurred lenders to rapidly contract subprime credit availability. Instead of the lower payments that had been anticipated, borrowers faced a reset shock as their monthly payments ballooned to the higher adjustable rate (Demyanyk and Van Hemert 2009). Thus the fact that defaulting subprime loans sparked the financial crisis was due not only to the heightened risk profile of subprime borrowers but to the fact that subprime ARM loans even more than others were premised on the dynamic of a bubble that could not last.

Financial Meltdown

By the beginning of 2007 the massive growth of unconventional-mortgage securitization had spread at least $3.8 trillion of assets directly linked to these mortgages to financial institutions around the world. Nonetheless it is clear that the markets, the credit ratings agencies, regulators, and most of the large banks all registered comparatively little response when housing prices started to stall out and mortgage default rates began to rise in late 2006. Several large banks such as Merrill Lynch and Citibank continued expanding their subprime businesses aggressively during the first two quarters of 2007. In March of 2007 Fed Chairman Ben Bernanke stated in congressional testimony that "at this juncture, the impact on the broader economy and financial markets of the problems in the subprime market seems likely to be contained" (Jeremy W. Peters and Edmund L. Andrews, "Manageable Threats Seen by Fed Chief," *New York Times*, March 29, 2007.)

The credit ratings agencies also continued to maintain an implausibly upbeat outlook through the first two quarters of 2007. Only after they were the subjects of widespread mockery on the financial blogosphere, endured congressional questioning, and experienced an overall crisis of legitimacy did the agencies take serious steps to adjust MBS bond ratings to reflect the deteriorating conditions in the mortgage market. Their reasons for reticence were clear. First, they had a vested interest in hoping the situation would improve, since their reputations and a significant portion of the revenues rested on a strong market in mortgage-backed securities. Second, ratings agencies knew what downgrading ratings would mean. Moody's CEO Raymond McDaniel justified its cautious approach to downgrades, noting that "because we are an influential voice, we can create a self-fulfilling prophecy by saying that there are

risks in the market ahead of those risks being revealed" ("Banks' Subprime Losses Top $500 Billion on Write Downs," Bloomberg News, August 12, 2008).

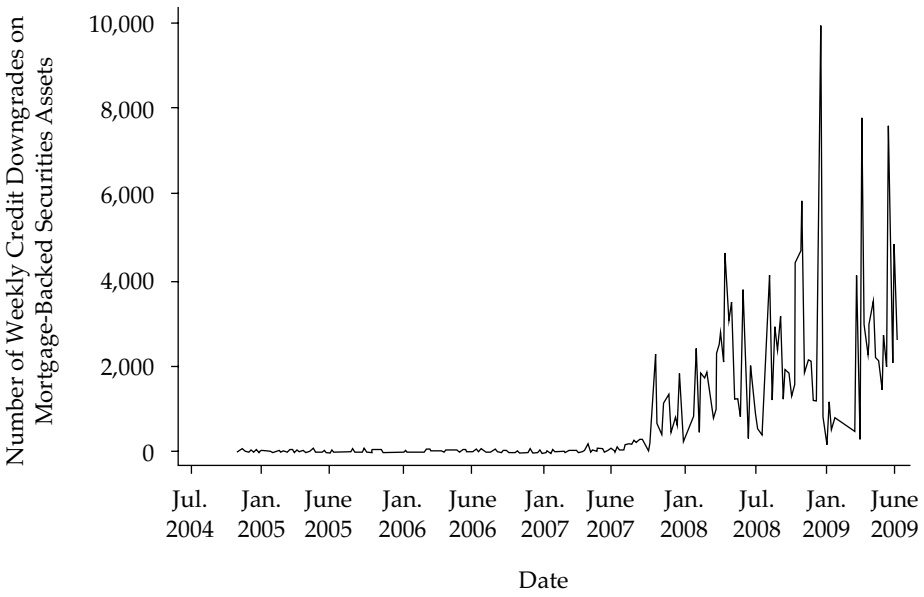
By July 2007, credit supply for nonconventional mortgages ground to a halt as demand for mortgage-backed securities based on those types of mortgages plummeted and banks became weary of the quickly weakening housing market. The volume of subprime originations declined by 90 percent between the first and second halves of 2007 (Inside Mortgage Finance 2009). The drying up of credit to fund subprime originations began hampering attempts by borrowers with adjustable-rate mortgages—even those whose houses had not yet declined in value—to refinance before their mortgage got reset to a higher rate. It also imperiled the business of large mortgage specialists like Ameriquest and Countrywide and began eating into the revenue streams of the commercial and investment banks that had come to rely on fee revenues from their vertically integrated mortgage finance franchises.

Bond defaults were initially concentrated among the lower-rated equity tranches, which were the first in line to lose in the event of revenue losses. But the rising tide of subprime delinquencies and foreclosures soon put pressure on the supposedly safe "AAA" tranches as well. Figure 2.8 shows weekly counts of negative credit actions taken by one of the big three ratings agencies against unconventional mortgage-backed securities and mortgage-related CDOs. Aside from a few small blips of activity in April and July of 2007, there were few downgrades on mortgage-backed securities, but they increased rapidly in September.

The downgrade plot's resemblance to a seismograph image is apt. Each round of mass downgrades sent tremors through the financial system. The significance of credit downgrades was that they forced leveraged banks that had taken loans to buy mortgage-backed securities either to pay off those loans or to post additional collateral with their creditors. This was because most of their loans contained covenants that required them to increase their capital investment if bond prices fell or the credit rating on the MBS collateral was downgraded. The problem, however, was that most banks were already very highly leveraged and eventually found it impossible to raise enough capital to cover their loans. This was the link between the implosion in the mortgage market and the freezing of the credit system.

The financial meltdown emerged from a novel configuration of forces, but it soon took on the relatively straightforward form of a classic banking panic. Lenders made calls on collateral, and the entities that had become highly leveraged in order to buy mortgage-backed securities suddenly found themselves in a liquidity crisis, unable to raise funds to cover debt backed by assets whose value was rapidly plummeting. This process first played out within the so-called shadow banking system of

Figure 2.8 Credit Downgrades of Mortgage-Backed Securities, by Month, 2008



Source: Authors' tabulation, based on ratings actions reported by Bloomberg Professional Terminal.
Note: Downgrades include all negative ratings actions on private-label mortgage-backed securities and mortgage-related collateralized debt obligations by Moody's, Standard & Poor's, and Fitch.

special investment vehicles, which were usually linked to a larger institution but funded themselves through short-term debt. As the price of their mortgage-backed securities and CDO assets fell, they needed cash to post as collateral with creditors, but since the credit markets were weary of extending them emergency money, they generally had to be rescued by their parent firms and placed back on the parent's balance sheet.

Two hedge funds affiliated with Bear Stearns were the first major shadow banking institutions to fail, in July of 2007. A similar crisis soon afflicted Citigroup, which would take over $55 billion in write-downs on mortgage-related assets ("Banks' Subprime Losses Top $500 Billion on Write Downs," Bloomberg News, August 12, 2008). The problem, as Gillian Tett (2009) and others have dramatically documented, was that the elaborate system of accounting vehicles banks built to hide their leverage from regulators and the elaborate network of credit default swaps they created to hedge their risks made it impossible for the market to

discern which banks were exposed to the mortgage-backed securities where the underlying mortgages were in default. The financial crisis escalated throughout the summer of 2008 in spite of efforts by the Federal Reserve to make emergency capital available.

It is useful to look at what happened to the top banks that were leaders in the mortgage securitization business circa 2005. Seven of the ten largest subprime lenders in 2005 went out of business or were absorbed by merger. Eight of the ten top subprime MBS-issuing companies in 2005 are either out of business or merged into other entities (Fligstein and Goldstein 2010). The collapse of the subprime market essentially wiped out all of the companies that had grown large on that business. The big investment banks at the core of the subprime MBS market no longer exist, with the exception of Morgan Stanley and Goldman Sachs. Citibank, Bank of America, JP Morgan Chase, and Wells Fargo have emerged as large conglomerate banks after absorbing many of the subprime losers, while both Goldman Sachs and Morgan Stanley have reorganized themselves to become commercial banks. Most of the institutions that survived only did so on account of the TARP bailout, and most took massive write-downs on MBS assets.

Summary

The preceding discussion leads us to argue that the proximate causes of the crisis can be found in two shifts in the structure of the mortgage-finance industry. First, the easy credit available to all forms of financial investors after 2000 meant that money could be made by borrowing money at a low interest rate and then turning around and buying mortgage-backed securities. This process of leveraging was the core strategy of banks and many other financial institutions. Investors worldwide who were not leveraged were also searching for higher but safe returns, and American mortgages looked good to them. These strategies brought all of the major banks aggressively into mortgage securitization and brought mortgage securitization to the center of the financial sector. It also made the financial positions of these firms especially sensitive to the credit markets, which would become negatively impacted by the core of the market, along with millions of households and the rest of the American economy.

The second cause of the crisis is as important as the first, but it is not well understood. By 2004, there were simply not enough prime or conventional mortgages left in the United States to package into mortgage-backed securities. The steep decline in mortgage originations after 2003 reflected neither weakness in the housing market nor slackening demand from the mortgage-backed securities market. Rather, a saturated prime market and an interest rate hike had led to a significant drop-off in

the refinancing activity that had driven the 2003 boom. Those who had money to buy mortgage-backed securities were still looking for product, but those who were originating and packaging mortgage-backed securities didn't have enough to meet the demand. So there was a huge incentive to increase the number of mortgages; it sent loan originators looking for new mortgage markets to feed the securitization machine and led to the rapid growth of the subprime and Alt-A markets. The aggressive pursuit of those markets by banks of all kinds has led us to the current situation. The main role that regulators played was their refusal to intervene in these markets. The Federal Reserve was dominated by people who believed that in spite of this dangerous shift in the market, market actors would not take on too much risk. We now know this was wrong. The evolution of banks' strategies since the early 2000s had left them highly leveraged on assets that were largely junk.

Myths and Half-Truths

Although it is early to develop any comprehensive explanations of why the meltdown occurred, already a body of conventional wisdom has emerged that comprises a number of questionable conclusions. In this section we evaluate several oft-repeated arguments about the mortgage meltdown and show that they are inconsistent with key pieces of evidence.

Perverse Incentives and the "Hot Potato" Theory

One of the most oft-repeated morsels of conventional wisdom about the crisis is that it happened because of misaligned incentives in the securitization process. This is often known as the "originate-to-distribute hypothesis," or, more colloquially, the "hot potato" theory (Baily, Elmendorf, and Litan 2008; Purnanandam 2009). The originate-to-distribute hypothesis attributes systemic risk to perverse transactional incentives: mortgage brokers and originators had an incentive to engage in reckless and fraudulent underwriting since they were selling loans off to an MBS packager and hence had no interest in ensuring the borrower's long-term ability to repay. MBS packagers in turn had little interest in monitoring the underlying quality of the bonds because they were selling these assets off to investors (Purnanandam 2009). This incentive-based analysis of the crisis forms much of the conventional wisdom underlying current regulatory reform proposals, for instance, the provision in the 2010 Dodd-Frank Act that requires issuers of securitized assets to retain at least 5 percent of the credit risk.

Gary Gorton (2008) has argued that the originate-to-distribute model, which focuses on the securitization process as such, is overdetermined

because it fails to identify the roots of the crisis in particular features of subprime mortgages. More fundamentally, our data show that most of the premises of the originate-to-distribute thesis turn out not to be true. First, the actual structure of the mortgage securitization industry differed from that presumed by the theory. The pursuit of vertical integration by the large MBS-producing firms meant that as the bubble grew, banks were increasingly originating, packaging, underwriting, and servicing mortgage-backed securities in-house rather than passing risk along a value chain of market transactions. We document this more thoroughly elsewhere (Fligstein and Goldstein 2010). Second, as shown in figure 2.3, the idea that issuers of mortgage-backed securities did not hold on to them turns out to be a myth. MBS producers aggressively marketed risky assets to investors all around the world, but they also retained a considerable portion of the assets themselves, largely because they were yielding high short-term returns (as long as borrowers made their monthly mortgage payments).

The fact that the companies most deeply involved in the production of risky mortgage-backed securities also retained such a significant portion of the securities and often went bankrupt as a result casts doubt on the notion that the crisis occurred simply because they were strategically selling the riskiest assets to unwitting investors. With the exception of Goldman Sachs and, to a lesser degree, JP Morgan, all of the large banks involved in the production of risky mortgage-backed securities continued to hold significant positions on these assets until the very end. The key players knew it was risky, but they thought they could control their risks through ploys like quasi-insurance in the form of credit default swaps (CDSs). They were making massive profits, which reinforced their views that their risks were being managed.

Another half-truth is the idea that underwriting standards were declining and investors who bought mortgage-backed securities could not know how risky the underlying loans really were. Evidence of declining underwriting standards during the 2000s is mixed. There are two sets of information about loan pools: the "hard" reported characteristics such as FICO scores and loan-to-value ratios, and "soft," "unobservable" information such as a borrower's true income in cases of stated-income loans (so-called low-documentation or "liars" loans). The soft information is often referred to as unobservable characteristics since it unknown to the securitizers who buy the mortgage, the ratings agencies, or investors. There is little evidence of systematic declines in observable characteristics within various mortgage segments (sub-prime, Alt-A, etc.)—in fact, average credit scores of subprime borrowers actually increased somewhat over the course of the bubble (Bhardwaj and Sengupta 2009b). But there is also evidence that declining underwriting standards were rendering loans riskier than the hard information would suggest (Dem-

yanyk and Van Hemert 2009). The use of low-documentation loans expanded considerably as the bubble grew, particularly in the Alt-A segment. Studies have found that these low-documentation loans ended up defaulting at a significantly higher rate than their observable characteristics would predict (Mayer, Pence, and Sherlund 2009). This implies that low-documentation loans were indeed liars' loans. It furthermore implies that declining underwriting standards *were* making mortgage loans ever riskier as the boom grew, and that they were doing so in a way that was unobservable by investors and credit ratings agencies.

Fraud and poor underwriting standards at the point of origination clearly played a role in exacerbating default risk and allowing the housing bubble to keep growing even when there were no more qualified buyers. But pinning the causes of the crisis on misaligned incentives and resulting misbehaviors at the point of origination elides two key facts.

First, the banks that bought and packaged these mortgages were clamoring for more risky no-down-payment and interest-only loans because they could earn higher returns on such loans (Fligstein and Goldstein 2010).

Second, the observable information about loan pools itself told a very risky story. When a conduit bank wants to issue an MBS, it has to file a prospectus with the SEC that includes information on the loan collateral. These prospectuses are public information and can be accessed at the SEC's website by a few clicks of a mouse. We tried this and here briefly examine the information contained in the prospectus for GSAMP Trust 2006-NC2 (http://www.sec.gov/Archives/edgar/data/1366182/000112528206003776/b413822_424b.txt), a typical subprime MBS issue during the height of the bubble. There were 3,949 subprime mortgages in the trust, worth $881 million, of which 43.4 percent were used to buy a new house and the balance were to refinance existing loans. Ninety and seven tenths percent of the mortgagees were going to live in the house; 73.4 percent were single-family dwellings and the rest were condominiums; 38 percent of the homes were in California and 10.5 percent in Florida. The average borrower had a FICO score of 626; 31.4 percent had a score below 600; 51.9 percent had a score between 600 and 660, and only 16.7 percent had a score above 660. The ratio of total debt to income was 42 percent in the whole set of mortgages. About 79 percent of the bond offering was rated "AAA," the highest rating. Less than 5 percent were rated "B," which should be more typical of a subprime rating.

This information is quite detailed and it was readily available to investors. Even if mortgage fraud meant mortgage pools were often riskier than advertised, anyone who looked at the prospectus for GSAMP 2006-NC-2 would see that the reported risk profile of the mortgages was already quite high.

In our view the problem was not so much that fraudulent origination

practices were surreptitiously rendering subprime loans even riskier than they appeared (though this was occurring to some extent). Rather, the real problem was that risky mortgages were becoming vastly more prevalent on account of banks' voracious appetite for raw mortgages to fuel their securitization machines. In this way high-risk loans came to constitute an ever-greater portion of financial assets.

Did Banks Underestimate the Risks?

Another overarching view of the crisis is to argue that actors underestimated the probability of rare and apparently improbable events such as a systematic drop in housing prices. This could possibly explain why supposedly risk-averse investors bought subprime mortgage-backed securities even though the underlying mortgages were clearly quite risky. We are skeptical of strong forms of this argument for a couple of reasons. First, the housing bubble looked like a bubble at the time. During the height of the boom there was a great deal of discussion in mortgage-finance trade journals about whether there was a bubble or merely local "bubbletops," as one commentator suggested. Ezra Zuckerman (2010) has conducted a content analysis that shows that the frequency of discussion about a housing bubble in the business press tracked the growth of the actual bubble. This is not a case of the blindsided herd or the "perfect storm." Moreover, the voices warning of mounting risks were not merely those of obscure contrarians. Several prominent economists, including the Federal Reserve Board governor Edward Gramlich, had been sounding numerous warnings about the subprime bubble for several years. Even more striking is that key industry actors recognized the risks. During a conference of mortgage industry executives at the height of the bubble in 2005, Countrywide's CEO Angelo Mozilo warned colleagues that they could all face an impending "catastrophe" ("Taking It Seriously," *National Mortgage News*, March 21, 2005, p. 4). Far from being beyond the realm of normal expectations, actors at the center of the bubble (who had much to lose if it burst) recognized a crash as a distinct possibility. This of course further deepens the puzzle of why, given this awareness, almost all the banks continued behaving so recklessly until it was too late. That puzzle is a central issue for future research on the crisis to investigate.

Financial Engineering and Instruments of Mass Destruction

Another explanation of the crisis focuses on the role of financial engineering innovations and the rise of exotic, highly complex financial instruments. For instance, Donald MacKenzie (2009, 10) writes, "The roots

of the crisis lie deep in the socio-technical core of the financial system." There are several reasons why the growing complexity of financial products such as CDOs may have heightened risk or served to conceal the risk of subprime-mortgage-backed securities. Whereas standard mortgage-backed securities allowed issuers to construct predominantly AAA tranches from subprime mortgages, CDOs helped turn BBB tranches, tranches that were the first to lose in the event of default, into AAA CDO tranches. One argument is that this made CDOs especially dangerous while simultaneously making them appear less risky and more palatable (see MacKenzie 2009). Another argument is that CDOs were problematic because progressive layers of abstraction in instrument structures entailed a progressive loss of information (Gorton 2008).

We believe the data are not consistent with any strong argument that instrument complexity was a primary driving force behind the crisis (see Fligstein and Goldstein 2010). Contrary to the hypothesis that financial engineering drove ratings inflation, the most highly complex and innovative CDO instruments actually displayed greater constancy in their overall ratings composition than low-rated mortgage-backed securities. Data also show that these instruments turned out on average to be no more overrated than the underlying mortgage-backed securities on which they were built, at least as measured by the magnitude of the subsequent downgrades they experienced after the meltdown. CDOs actually tended on average to be somewhat less overrated than all of the more risky securities. This suggests that variations in overrating were related as much to the underlying quality of the mortgage debt as the complexity of the bond structure. In retrospect it is not surprising that there should be little overall difference in the performance of mortgage-backed securities and mortgage-related collateral debt obligations, since both were grounded in the same overarching housing bubble. In other words, the driving force behind the meltdown is that banks were producing trillions of dollars of mortgage-backed securities on the back of a housing bubble—not that they were doing so using ever more complex security structures.

Conclusion

In this account of the financial meltdown we challenge several conventional wisdoms that have taken hold. First, one of the "facts" that is already taken for granted by commentators of various stripes is that the banks that originated mortgages and packaged mortgage securitization never held on to the securities themselves. It is asserted that this perverse incentive made them more likely to take on larger risks since they could simply pass risk along the value chain. We show that, contrary to

this view, almost every large originator and packager of mortgages held on to substantial numbers of mortgage-backed securities and that they increased their holdings dramatically after 2001. Simply put, they believed that they could control the amount of risk they held. The result is that most of these companies are either out of business, merged into larger banks, or are owned by the federal government.

Second, we present evidence contrary to the common assertion that the crisis was one that few people saw coming. We note that the presence of a housing bubble was widely discussed during the mid-2000s, and we cite several instances where bank executives and regulators at the center of the debacle expressed awareness of the risks.

Third, we argue against the idea that the increasing complexity and opacity of financial instruments, particularly CDOs, was a chief contributor to the mortgage-backed securities bubble and subsequent meltdown. We cite evidence to suggest that the most complex mortgage-related derivatives did not perform any worse on average than simpler ones backed by risky mortgages. All of these instruments were ultimately perched atop the same overarching housing bubble.

From the mid-1990s through 2007 all of the main market actors connected to mortgage securitization—the originators, the packagers, the wholesalers, the servicers, and the ratings companies—became not only larger but more concentrated. By the end, a small number of banks controlled at least 40 percent of the market in every segment of the industry, and in some market segments it was closer to 90 percent. Activity in separate product niches also increasingly condensed around the same dominant firms. As a result, the mortgage field was not an anonymous market scattered across the country but instead consisted of a few large firms.

In the end, the strategies these five dominant firms pursued created the conditions for the meltdown. Their lending strategies fueled and fed off the housing bubble, and they did so using mortgage products whose performance was premised on continued growth of that bubble. After 2004, the financial industry coalesced around high-risk mortgage lending as their primary cash cow. Subprime mortgages, which had been a relatively small business that extended credit availability to underserved borrowers, suddenly became a foundation of twenty-first-century finance capitalism. The complete collapse of the financial system and resulting recession have shown the folly of that strategy. The financial sector was saved by the government takeover of the GSEs and the bailout of the rest of the banking system. The Federal Reserve now is the largest purchaser of mortgage-backed securities.

In an ironic way, the mortgage-backed securities market has come full circle. The government created it in order to stimulate the housing market in the 1960s and 1970s. They were pleased to invent and support the

market and do what it took to bring in private investment. But eventually, those banks expanded their activities into risky investments with borrowed capital. After the stock market crash of 2000, the Federal Reserve dropped interest rates dramatically. This created the conditions for a rapid expansion of the mortgage securitization market. Low interest rates gave banks access to cheap capital that they could lend to households and create mortgage-backed securities. It also effectively heightened demand for mortgage-backed securities from investors since yields on treasuries were so low. But by the end of 2003 the supply of raw mortgages had begun to run out. To fulfill secondary market demand, originator banks and conduit banks (increasingly the same people) needed to find a new mortgage market. The market they found was the subprime market, which turned out to be wildly profitable. In the end, almost all of the large players in the financial system came to own lots of mortgage-backed securities. The ones who did so by borrowing money cheaply found themselves in a liquidity crisis beginning in 2007.

Regulators and policymakers enabled this process at virtually every turn. Part of the reason they failed to understand the housing bubble was willful ignorance: they bought into the argument that the market would equilibrate itself. In particular, financial actors and regulatory officials both believed that the mortgage-backed securities markets could effectively control risk through pricing. For instance, the idea that banks could buy quasi-insurance in the form of credit default swaps was one of the arguments for allowing them to take on more leverage. If the market thought the risk of default was high, then the price of the credit default swaps would reflect that risk.

But perhaps most important of all was the fact that regulators such as Alan Greenspan failed to see how the industrial-scale infusion of credit brought on by securitization linked real estate markets together in new ways. Lenders pumped easy credit into zip codes with quickly appreciating housing prices because it satisfied the assumptions built into their mortgage products. This of course further contributed to the bubble (Mayer, Pence, and Sherlund 2009; Nadauld and Sherlund 2009; Herbert and Apgar 2010). As a result, housing prices that historically had been driven by local dynamics became linked via the lending strategies of the big firms.

It is no accident that the locus of this historic debacle was housing finance. Securitization was first developed in this area and was most mature there. Residential real estate also held special status of retaining value, allowing firms to justify risky practices as contributing to the American dream of home ownership. Perhaps most important, the MBS-fueled bubble was abetted by the ingrained myth that house prices always go up. When that idea proved to be wrong, the lives of millions of Americans were tragically shattered.

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Notes

1. Globally linked worldwide financial markets had begun to seek out countries where various kinds of risk existed (for example, Iceland and Latvia) and sought to sell off financial assets in those countries. Some of these risks were caused by countries such as Great Britain, Ireland, and Spain emulating the U.S.-style housing bubble. Other countries, among them Greece and Hungary, were running huge current-account deficits. Finally, the slowdown in the U.S. economy had an effect on world exports, and countries such as Germany and Japan, whose economic growth depended on high exports to the United States, experienced an economic slowdown. Countries such as China and Poland, which were less exposed to any of these risks, fared better. As a result of the very different situations in different countries, these myriad effects have played themselves out in different ways in different countries.
2. The Federal National Mortgage Association (FNMA) is known as Fannie Mae, the Federal Home Loan Mortgage Corporation (FHLMC) is known as Freddie Mac, and the Government National Mortgage Association (GNMA) is known as Ginnie Mae.

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