CHAPTER 1

Lessons Learned from Banking Crises

This chapter examines the causes of the recent financial crisis that began in the United States and then spread around the world. It also explains seven lessons that can be learned from financial crises.

INTERNATIONAL FINANCIAL CRISES

Economic crises are not new. In A.D. 33, Emperor Tiberius had to inject 1 million gold pieces of public money into the Roman financial system to keep it from collapsing.[1] There have been at least 60 different crises since the early seventeenth century.[2] As shown in Table 1.1, there were 16 economic crises between 1987 and 2010. The impact of each crisis varied widely. For example, the removal of the British pound from the European Exchange Rate Mechanism in 1992 and the Russian ruble collapsing in 1997 did not have a major impact in the United States. However, the economic crisis that began in the United States in 2007 was the worst since the Great Depression in the 1930s. Equally important, it became a global crisis. In 2009, crises in Iceland and Dubai adversely affected global investors. In 2010, the financial crisis in Greece roiled the European Union. The European countries having financial problems were Portugal, Ireland, Italy, Greece, and Spain; they were referred to collectively as the PIIGS.

The crisis became global because the biggest banks in the world, most of which are foreign owned, have extensive operations in the United States. Equally important, the largest banks in the United States have extensive overseas operations. Citigroup, for example, has offices in 140 countries, JPMorgan Chase has offices in 60 countries, and Bank of America operates in more than 30 foreign countries.[3]

Table 1.2 lists the world's 10 largest banks in 2007. Royal Bank of Scotland (RBS, first on the list) owned Citizens Financial Group, Inc., the

TABLE 1.1 International Financial Crises, 1987–2010

1987	U.S. stock market crash
1990	Collapse of U.S. high-yield bond market
1991	Oil price surge
1992	Britain removes pound from the European Exchange Rate Mechanism
1994	U.S. bond market crashes
1995	Mexican crisis
1997	Asian crisis
1997	Russian default, ruble collapses; Long-Term Capital Management bailout
2000	Technology, media, and telecom sectors collapse
2001	September 11 payment system disruption
2002	Argentine crisis
2002	German banking crisis
2007	U.S. subprime mortgage turmoil
2009	Iceland's financial crisis
2009	Dubai's financial crisis
2010	Greece's financial crisis

Source for data through 2007. Leonard Matz. "Liquidity Analysis: Decades of Change," Federal Deposit Insurance Corporation (FDIC) *Supervisory Insights*, Winter 2007, Vol. 4, Issue 2 (Freely adapted from a presentation by Leonard Matz, International Director, BancWare Academy for SunGard BancWare, at Federal Financial Institutions Examination Council (FFEIC) Capital Markets Specialist Conference in June 2007).

TABLE 1.2 World's 10 Largest Banks in 2007

Rank	Name	Country	Assets
1	Royal Bank of Scotland (RBS)	United Kingdom	$3.81($ trillions)
2	Deutsche Bank	Germany	2.97
3	BNP Paribas	France	2.49
4	Barclays Bank	United Kingdom	2.46
5	HSBC Holdings	United Kingdom	2.35
6	Crédit Agricole Group	France	2.27
7	Citigroup	USA	2.19
8	UBS	Switzerland	2.01
9	Bank of America Group	USA	1.72
10	Société Générale	France	1.59

Source: "The World's Biggest Banks," *Global Finance,* October 2008, p. 111.

14th largest bank holding company in the United States.[4] A bank holding company (BHC) is a corporation that owns one or more banks or financial service organizations. Deutsche Bank, from Germany, owned Tannus Corporation, the 8th largest BHC, and BNP Paribas owned BancWest Corporation, the 22nd largest BHC. Crédit Agricole (6th on the list) is the only large bank without U.S. operations.

WHAT CAUSED THE CRISIS IN THE UNITED STATES?

Population Growth and Urbanization

Population growth was the most important driving force behind the real estate booms and busts. It created the demand for housing. The population of the United States increased from 205 million in 1970 to more than 302 million in 2007,[5] and about 100 million additional people had to live somewhere. They moved into urban areas such as Atlanta (Georgia), Dallas (Texas), Los Angeles (California), Las Vegas (Nevada), Miami (Florida), and other metropolitan areas located mostly in the south and southwestern parts of the United States.

The increased participation of women in the workforce is another demographic factor to be considered. Women accounted for 38 percent of the labor force in 1970, and 59 percent of the labor force in 2007. Two-income families tend to buy bigger and more expensive homes. In 1980, the average size of a single family home was 1,740 square feet, and it cost $64,600. In 2007, the average size was 2,521 square feet, and the cost soared to $247,900.[6]

Government Policies

Laws The U.S. Congress recognized that the increased population had increased the demand for housing, and they passed the laws that facilitated home ownership. The following is a partial list of those laws:

- Community Reinvestment Act (CRA, 1977) encouraged depository institutions to meet the credit needs of their communities, including low- and moderate-income neighborhoods. The CRA requires that each depository institution's record be evaluated periodically. The CRA examinations are conducted by the federal agencies that are responsible for supervising depository institutions. Depository institutions include Federal Deposit Insurance Corporation (FDIC) insured banks (commercial banks, savings banks, mutual savings banks), insured credit unions, and other institutions defined by law.[7]

- Depository Institutions Deregulation and Monetary Control Act (DIDMCA, 1980) preempted state interest rate caps on loans.
- Alternative Mortgage Transaction Parity Act (1982) permitted the use of variable interest rates and balloon payments.
- Tax Reform Act of 1986 eliminated the tax deduction for interest expense on credit cards. This induced borrowers to use home equity lines of credit (HELOC) or second mortgages on their homes. The interest on mortgage loans is a tax-deductible expense.
- Taxpayer Relief Act (1997) eliminated capital gains tax on the sale of homes priced up to $500,000 for married couples. People cashed out home equity profits to buy additional homes or condominiums. The snowbirds (people living in the colder northern part of the United States) bought second homes in the warmer southern and western parts of the country, in places such as Florida, Arizona, and Nevada.

Government-Sponsored Entities Government-sponsored entities (GSEs)—the Federal National Mortgage Association (FNMA, Fannie Mae), the Federal Home Loan Mortgage Corporation (FHLMC, Freddie Mac), and the Government National Mortgage Association (Ginnie Mae)—were chartered by Congress to provide liquidity, stability, and affordability to the U.S. housing and mortgage markets. Fannie Mae was established as a federal agency in 1938, and it became a private shareholder-owned company in 1968. Freddie Mac was chartered by Congress in 1970, and in 1989 it, too, became a publicly traded company. In 1968, Congress established Ginnie Mae as a government-owned corporation within the Department of Housing and Urban Development (HUD). It is still government owned.

Fannie Mae packages (i.e., securitizes) mortgage loans originated by lenders in the primary mortgage market into mortgage-backed securities (Fannie Mae MBSs) that can then be bought and sold in the secondary mortgage market. It also participates in the secondary mortgage market by purchasing mortgage loans (also called *whole loans*) and mortgage-related securities, including Fannie Mae MBSs, for its mortgage portfolio.[8] Freddie Mac's operations are similar to those of Fannie Mae.

Beginning in the1970s, Fannie Mae and Freddie Mac played a major role in changing the housing finance system from deposit-based funding to funding based on capital markets. By 1998, 64 percent of originated mortgage loans were sold by the mortgage originators to large financial institutions and the GSEs that securitized the mortgage loans and sold them to investors.[9] Fannie Mae and Freddie Mac also provided guarantees for their mortgage-backed securities. Subsequently, capital market investors funded the majority of housing finance. Non-GES securitizations also increased sharply in 2003–2006.

Because Fannie Mae and Freddie Mac are private shareholder-owned companies, management chose to grow the firms by acquiring low-quality, high-risk mortgages in order to maximize shareholder wealth.[10] It worked well until the real estate bubble burst, and the government placed them under conservatorship on September 6, 2008. The Federal Housing Finance Agency (FHFA) is the conservator.

Ginnie Mae deals exclusively in loans insured by the Federal Housing Administration (FHA) or guaranteed by the Department of Veterans' Affairs (VA). Other guarantors or issuers of loans eligible as collateral for Ginnie Mae MBSs include the Department of Agriculture's Rural Housing Service (RHS) and HUD's Office of Public and Indian Housing (PIH). Consequently, Ginnie Mae securities are the *only* MBS to carry the full faith and credit guaranty of the U.S. government.[11]

The Federal Home Loan Bank System was created in 1932 to provide funding for home mortgages.[12] Today, federal home loan banks (FHLBs) provide funding to banks for housing, development, and infrastructure projects. They are cooperatives owned by banks and other regulated financial institutions. Their advances to their member institutions provided an important source of funding and liquidity both before and during the banking crises.[13]

According to Sheila Bair, chairman of the FDIC,

> *Many of the products and practices that led to the financial crisis have their roots in the mortgage market innovations that began in the 1980s and matured in the 1990s. Following large interest-rate losses from residential mortgage investments that precipitated the thrift crisis in the 1980s, banks and thrifts began selling or securitizing a major share of their mortgage loans with the housing government sponsored enterprises (GSEs). By focusing on originating, rather than holding, mortgages, banks and thrifts were able to reduce their interest-rate and credit risk, increase liquidity, and lower their regulatory capital requirements under the rules that went into effect in the early 1990s. Between 1985 and the third quarter of 2009, the share of mortgages (whole loans) held by banks and thrifts fell from approximately 55 percent to 25 percent. By contrast, the share of mortgages held by the GSEs increased from approximately 28 percent to just over 51 percent, over the same time period (see Figure 1.1).*[14]

Figure 1.1 also shows the dramatic growth of home mortgages, the growth of GSEs, and banks' declining share of the home mortgage market.

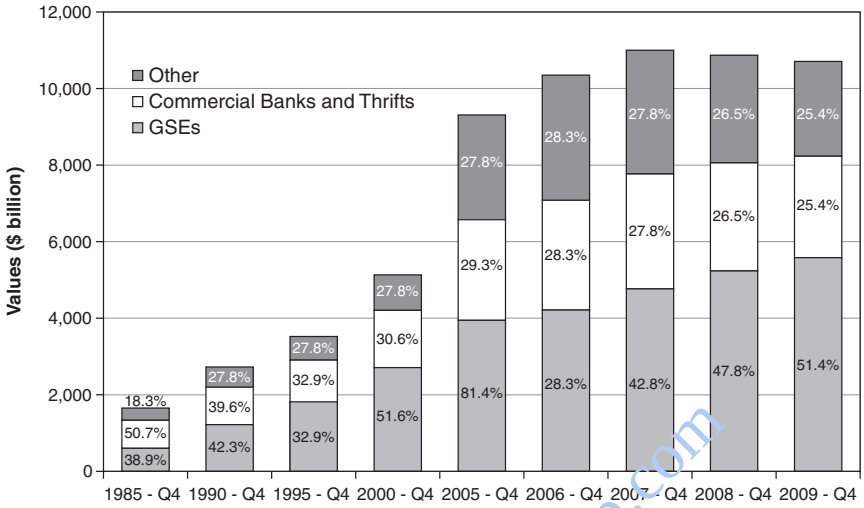

FIGURE 1.1 As Home Mortgage Volumes Grew, the Share Held by Banks and Thrifts Declined
Source: Sheila C. Bair, Chairman, FDIC, Statement on the Causes and Current State of the Financial Crises before the Financial Crisis Inquiry Commission, January 14, 2010.
Source: Haver Analytics, "Flow of Funds."

Declining Mortgage Rates and Increased Funding by Shadow Banks

The contract interest rate on a 30-year conventional fixed-rate mortgage peaked at 14.67 percent in July 1984.[15] Subsequently, mortgage rates declined gradually over the years, reaching 4.81 percent in May 2009, and remained below 5 percent until late December.

Both foreign investors and foreign governments invested heavily in the U.S. economy. These investors include, but are not limited to, Japan and China buying government bonds. Sovereign wealth funds (state-owned investment companies) invested billions of dollars in Citigroup, Morgan Stanley, Merrill Lynch, and other financial firms.[16] Unregulated financial institutions, such as hedge funds and private equity funds, also made billions of dollars available to borrowers and lenders. The so-called *shadow banking system*—"the whole alphabet soup of levered up non-bank investment conduits, vehicles, and structures"—helped to provide the liquidity that funded the real estate boom.[17] Shadow banks include investment banks, finance companies, money market funds, hedge funds, special purpose entities, and other vehicles that aggregate and hold financial assets. Shadow banks are unregulated or lightly regulated, and they do not have access to

central bank liquidity or public-sector credit guarantees.[18] "The shadow banking system was extremely vulnerable to financial stress in three ways: (1) some were highly leveraged; (2) they relied disproportionately on short-term funding markets; and (3) they did not benefit from explicit government support prior to the crisis. As a result, the shadow banking system was vulnerable to panics."[19]

The availability of funds and the decline in mortgage rates encouraged existing homeowners to refinance their mortgages at lower rates and others to take advantage of the falling rates to buy homes, condominiums, and investment properties. Between 2000 and 2005, housing prices in the United States rose 51 percent (34 percent when adjusted for inflation), double any period in the past 30 years![20]

Subprime Loans

The global financial crisis is associated with subprime real estate loans. A standard definition for *subprime* does not exist. Nevertheless, the term *subprime* typically refers to high-risk loans made to borrowers with low credit scores (e.g., Fair Isaac Corporation [FICO] credit scores below 620), and/or high loan-to-value ratios, and/or debt-to-income ratios above 50 percent, and other factors.[21] Some mortgage loans had little or no documentation (*low doc* and *no doc* loans). Subprime loans also include nonconforming loans. These are real estate loans that do not conform to the GSEs' loan standards. For example, Fannie Mae limited single-family homes to $359,650 in 2005 for one-unit properties.[22] The limit was raised to $417,000 in 2006 and remained at that level in 2010.

Many subprime real estate loans had *adjustable rate mortgages* (ARMs), which further increased the default risk. By way of illustration, consider a 2/28 ARM. Table 1.3 illustrates the difference between the payments of a fixed-rate mortgage and the 2/28 ARM when market rates of interest rise. The ARM has a low teaser interest rate for the first two years of a 30-year loan (2/28) to induce borrowers to use this method of financing.

TABLE 1.3 Sample ARM Comparison 2/28 ARM, $200,000 loan/30 years

Years and Interest Rates	Fixed Rate 7.5%	Reduced Initial Rate 2/28 ARM (7% for 2 years then adjusting to variable rate)
Years 1–2 7.5%	$1,598	$1,531
Year 3 10%	$1,598	$1,939
Year 4 11.5%	$1,598	$2,152
Years 5–30 13%	$1,598	$2,370

However, when market rates of interest rise, the monthly payments increase significantly. In some cases, the new payments exceed the borrower's ability to repay the loans, and the loans go into default.

The housing bubble burst in 2005. When housing prices began to decline sharply, the delinquency rate on subprime loans began to soar.[23] The delinquency rate on subprime ARMs was 10 percent in early 2005 and 28 percent in March 2009.[24] More will be said about that shortly. The decline in house prices and increase in delinquency rates contributed to increasing foreclosures.

The Role of Securitization, Mortgage-Backed Securities, Credit Default Swaps, and Models in the Crisis

Securitization *Securitization* is a financial innovation that gained widespread use in the 1970s.[25] It refers to packaging and selling mortgage loans, credit card loans, and other loans. Securitization is a great financial tool when used properly. However, the improper use of securitized mortgage loans was the time bomb that set off the financial crisis. The problem was that the originators of the securitized mortgage loans got paid when they sold the MBSs to other investors. They did not retain an equity interest in the MBSs. Stated otherwise, they had no skin in the game. This contributed to a moral hazard problem because the originators had no risk associated with selling high-risk, low-quality loans (i.e., subprime loans) to investors. The more loans they sold, the more money they earned. Thus, the basic business model of banking changed from originating and holding loans to originating and distributing loans.

The large foreign banks that were discussed previously acquired securitized mortgage loans, and they facilitated their distribution around the world. Thus, the impact of rising delinquency rates and defaults on mortgage loans that were originated in the United States was felt globally.

MBSs are a type of *collateralized debt obligations* (CDO). A CDO is an asset-backed security that pays cash flows based on the underlying collateral, which may be residential real estate, commercial real estate, corporate bonds, or other assets. The MBS CDOs are divided into classes, or *tranches,* that have different maturities and different priority for repayment.

The lack of transparency of complex MBSs was part of the problem. Investors did not know exactly what they were buying, and the credit rating agencies did not correctly estimate the risks of these securities. Two plausible reasons that the credit rating models did not work well are that they were based on historical data that didn't apply to subprime loans, and they

made certain assumptions about future economic conditions. When neither assumption is correct, the models did not accurately reflect credit risk.

Credit Default Swaps Because investors did not fully understand the risks associated with securitized loans, they bought *credit default swaps* (CDSs), a form of insurance or hedge for MBSs.[26] If the borrower defaults, the holder of the debt is paid by the insurer. The CDSs are also used by traders who make naked bets (i.e., they speculate and do not hold the debt) that the prices of certain debt securities will decline.

The CDS market increased from about $6.4 trillion in December 2004 to about $57.9 trillion in December 2007.[27]

American International Group (AIG) was the major issuer of CDSs. Its failure would have caused systemic risk in the financial markets. Consequently, when AIG got into trouble in September 2008, the Federal Reserve provided $85 billion in loans.[28] The loans had a 24-month term. Interest accrued on the outstanding balance at a rate of three-month London Interbank Offered Rate (LIBOR) plus 850 basis points.

Quantitative Models Mortgage lenders, insurance companies (AIG), credit rating agencies (Standard & Poor's, Moody's), credit scoring companies (Fair Isaac), and others make extensive use of quantitative models in their risk management and rating systems. According to Nobel Prize laureate in economics Robert Merton, models can be thought of as incomplete descriptions of complex reality. "The mathematics of financial models can be applied precisely, but the models are not at all precise in their application to the complex real world. Their accuracy as a useful approximation to that world varies significantly across time and place."[29]

Quantitative models, such as the Black-Scholes-Merton (BSM) option pricing model, are based on certain assumptions. For example, the BSM model assumes that markets are continuous in time and infinitely liquid. However, that is not a realistic assumption.[30] Similarly, the efficient market hypothesis (EMH)—that "competition among market participants causes the return from using information to be commensurate with its cost"—also has limitations.[31] According to Ball (2009), EMH is about the demand side of the market and is silent on the supply side of the information market (e.g., accounting reports, statements from managers, government reports). The information does not have the same meaning to investors with different investment objectives, markets are not costless to operate, taxes need to be considered, and other issues are also involved.

For the most part, the models used the credit ratings, and others were based on historical data that did not accurately foresee future events. Stated

otherwise, models have limits. When the markets exceed those limits, the models fail.

According to Richard Fisher, president of the Federal Reserve Bank of Dallas:

> *The excesses in subprime lending in the United States were fed by an excessive amount of faith in technically sophisticated approaches to risk management and a misguided belief that mathematical models could price securitized assets, including securities based on mortgages, accurately. These valuation methodologies were so technical and mathematically sophisticated that their utter complexity lulled many people into a false sense of security. In the end, complexity proved hopelessly inadequate as an all-encompassing measure of risk, despite its frequent advertisement as such. The risk models employed turned out to be merely formulaic descriptions of the past and created an illusion of precision.*[32]

Bank Business Models As a result of the growth of securitized assets and brokered deposits, the basic business model has changed for some banks. The term *deposit broker* is defined as any person engaged in the business of placing deposits, or facilitating the placement of deposits, of third parties with insured depository institutions. A *brokered deposit* is any deposit that is obtained, directly or indirectly, from a deposit broker.[33] The ability to buy and sell both loans and deposits has increased banks' liquidity. One consequence of the increased liquidity is that the basic business model of many banks is changing. It used to be to originate and hold loans. The new business model is to originate in order to distribute loans. Not all banks use the new model.

Dependence on short-term funds contributed to the increased liquidity crisis in 2008. A *liquidity crisis* is "defined as a sudden and prolonged evaporation of both market and funding liquidity with potentially serious consequences for the stability of the financial system and the real economy."[34] Market liquidity is the ability to trade a market instrument with little or no change in the price. Funding liquidity is the ability to raise cash or its equivalents by selling assets or borrowing funds. To avoid future liquidity crises, federal bank regulators sought comments on a proposed "Interagency Guidance on Funding and Liquidity Risk Management" in July 2009.[35] The proposed guidance is consistent with "Principles for Sound Liquidity Risk Management and Supervision" issued by the Basel Committee on Banking Supervision (BCBS) in September 2008.

Excessive Financial Leverage

Many subprime lenders and investment banks were very highly leveraged. An equity capital ratio of 3 percent means that for every $1 in equity capital, there are assets (i.e., loans, investments, other assets) of about $33. A $1 dollar loan loss translates into a 100 percent loss of the lender's capital. Bear Stearns had an equity capital ratio of 3 percent. It avoided failure in March 2008 by being acquired by JPMorgan Chase.[36]

Some hedge funds have lower equity capital ratios, such as 2 percent. In other words, they had $50 in assets for every $1 in equity capital. When highly leveraged borrowers default, the losses flow back to highly commercial banks. In 1999, the President's Working Group on Financial Markets said the following in its report on Long-Term Capital Management (LTCM), a hedge fund that almost failed.

> *When leveraged investors are overwhelmed by market or liquidity shocks, the risks they have assumed will be discharged back into the market. Thus, highly leveraged investors have the potential to exacerbate instability in the market as a whole. . . . These secondary effects, if not contained, could cause a contraction of credit and liquidity, and ultimately, heighten the risk of a contraction in real economic activity.*[37]

According to the Basel Committee on Banking Supervision:

> *One of the main reasons the economic and financial crisis became so severe was that the banking sectors of many countries had built up excessive on- and off-balance sheet leverage. This was accompanied by a gradual erosion of the level and quality of the capital base. At the same time, many banks were holding insufficient liquidity buffers. The banking system therefore was not able to absorb the resulting systemic trading and credit losses nor could it cope with the reintermediation of large off-balance sheet exposures that had built up in the shadow banking system. The crisis was further amplified by a procyclical deleveraging process and by the interconnectedness of systemic institutions through an array of complex transactions. During the most severe episode of the crisis, the market lost confidence in the solvency and liquidity of many banking institutions. The weaknesses in the banking sector were transmitted to the rest of the financial system and the real economy, resulting in a massive contraction of liquidity and credit availability. Ultimately the public sector had to step in with unprecedented injections of liquidity, capital support and guarantees, exposing the taxpayer to large losses.*[38]

The equity capital ratio for FDIC-insured commercial banks was 10.92 percent in the third quarter of 2009.[39] The *equity capital ratio* is the bank's equity capital, exclusive of the allowance for loan and lease losses, divided by the bank's total assets. Although the equity capital ratio for banks is substantially higher than that of hedge funds, banks are still highly leveraged compared with nonfinancial corporations, which have an equity capital ratio 58.6 percent.[40]

Bank Failures

The number of FDIC-insured bank and savings institution (hereafter called *banks*) failures increased from zero in 2005–2006 to 25 banks in 2008 and 140 banks in 2009 (as of December18). To put the number of failures in perspective, about 9,000 banks failed during the Great Depression of the early 1930s, and more than 1,600 banks failed during the 1980–1994 period (Table 1.4). The data also show that the number of banks has declined over the years, reflecting the consolidation and increased asset concentration of the banking system. In the first quarter of 2009, there were 8,246 FDIC-insured banks.[41] Out of that total, 115 banks with assets greater than $10 billion held 78 percent of the total assets.

Rather than letting the largest U.S. financial institutions fail, federal banking authorities arranged for Bank of America to buy Countrywide in January 2008 and Merrill Lynch in September. The government took over Fannie Mae and Freddie Mac in September, and the Federal Reserve invested in AIG. Nevertheless, the government let Lehman Brothers fail in September 2008.

TABLE 1.4 Bank Failures

Years	Number of Banks	Number of Bank Failures
Great Depression, 1930s	14,146 (12/1934)	9,000+
1980–1994	10,451 (12/1994)	1,600
1995–2004	8,976 (12/2004)	55
2005–2006	8,681 (12/2006)	0
2007	8,533 (12/2007)	3
2008	8,305 (12/08)	25
2009	8,200	140

Source: FDIC, *Statistics on Banking, Historical 1934–1994,* Vol. 1, 1995; FDIC, *History of the Eighties, Lessons for the Future,* Vol. 1, 1999; "FDIC Statistics at a Glance, Historical Trends as of March 31, 2009"; FDIC Failed Bank List.

Changes in the following banking laws contributed to bank consolidation and increasing banks' geographic footprint and the services and products that banks could offer their customers. These changes helped to reduce the number of bank failures by providing greater geographic and product diversification.

- Bank Holding Company Act of 1956 allowed bank holding companies to acquire banks in other states.
- Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 allowed interstate branch banking.
- Gramm-Leach-Bliley Act of 1999 (GLBA) permitted financial holding companies to engage in banking, selling insurance and securities, and other activities.

LESSONS LEARNED FROM FINANCIAL CRISES

Lesson 1: Financial Leverage—Caveat Emptor

Financial leverage is a double-edged sword. It can be beneficial to earnings per share when revenues are increasing, or it can result in bankruptcy when revenues decline. It should be used prudently. But it wasn't, and excessive financial leverage contributed significantly to the global financial crises.

Leveraged Borrowers Some corporate borrowers are highly leveraged. As previously noted, Bear Stearns, the former investment bank, had a leverage ratio of 33:1. Bear Stearns faced failure from its losses; it was acquired by JPMorgan Chase. Hedge funds may have even higher leverage ratios (e.g., 50:1), which makes them very risky borrowers. For every $1 in equity, there are $50 in assets. A $1 reduction in the value of the assets wipes out the equity.

Many individual borrowers increased their financial leverage through repeatedly cashing out and refinancing their homes. As home prices appreciated in value during the boom part of the real estate cycle, many home owners borrowed increasing amounts. The repeated refinancing of home mortgages resulted in an estimated $1.5 trillion in losses when real estate prices declined and the mortgage loans went into default.[42]

Leveraged Loans Consider the case of a 25-year, $1 million commercial real estate loan with a 7 percent fixed rate of interest. As shown in Table 1.5, Panel A, if 100 percent of the value of the real estate is borrowed, the expected annual income from the real estate project is $85,810. If the borrower

TABLE 1.5 Real Estate Values

Panel A 25-Year $1,000,000 Commercial Real Estate Loan at 7 Percent Fixed Rate

	Loan/Value 100%	Loan/Value 90%	Loan/Value 80%	Loan/Value 70%
25-Year real estate loan	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Initial asset value	$1,000,000	$1,111,111	$1,250,000	$1,428,571
Expected annual income	$85,810	$95,346	$107,263	$122,586

Panel B Interest Rates Increase 200 Basis Points to 9 Percent

	Loan/Value 100%	Loan/Value 90%	Loan/Value 80%	Loan/Value 70%
25-Year real estate loan	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Present value of asset at 9%	$842,877	$936,536	$1,053,602	$1,204,113
Asset value less loan amount	−$157,123	−$63,464	$53,602	$404,798
Probable outcome	Default likely	Default possible	Positive equity value	Positive equity value

borrows 90 percent of the value of the property, then the initial value of the property is about $1.1 million ($1,000,000/.90 = $1,111,111). Similarly, if the borrower borrows 70 percent, the initial value of the property is about $1.4 million. The table also shows the expected annual incomes.

Suppose that market rates of interest increase 200 basis points to 9 percent. As shown in Panel B, the value of the property declines. In the case of the 100 percent loan/value ratio, the property is worth $157,123 less than the amount of the loan, and default is likely. Similarly, when the loan/value ratio is 90 percent, default is likely. In both these cases, the property is worth less than the amount of the loan. Stated otherwise, the property is underwater.

When the loan/value ratios are lower, the owner has a positive equity value and will not default. The lesson to be learned here is that high loan/value ratios are risky, because the borrower is more likely to default if the property is underwater.

Leveraged Lenders Commercial banks are for-profit corporations whose objectives include maximizing shareholders' wealth. The faster a bank can

grow, the greater the potential profits. However, the success of their growth depends in part on how it is financed. An increasing number of banks are using *noncore funding sources* of funds. These include time deposits over $100,000, brokered deposits, and foreign office deposits. Banks also borrow funds from federal home loan banks. Noncore funding can increase a bank's financial leverage. It also increases its liquidity risk.[43]

Regulatory capital requirements limit the degree to which banks can be leveraged. In the third quarter of 2009, their risk-based core capital (leverage) ratio was 8.44 percent.[44] *Core capital* includes common equity capital plus noncumulative perpetual preferred stock plus minority interest in consolidated subsidiaries, less goodwill and other ineligible intangible assets. It does not take many loan losses to wipe out the bank's capital. In simple terms, commercial banks have about $12 in loans and other assets for every $1 of capital. In September 2010, bank regulators announced plans to increase bank capital requirements, thereby reducing financial leverage. The details are explained in Chapter 8.

On the other side of the coin, higher capital requirements for lenders may result in less lending. Thus, in the short run, there is a trade-off between lending and the growth rate of bank capital. How much capital banks should hold is debatable.

Collectively, when a large number of highly leveraged borrowers default on their loans, it has a cascading effect on the banks. Thus, if highly leveraged borrowers default on loans to highly leveraged hedge funds, which in turn default on bank loans, there will be a large number of bank failures.

Bank Failures in Iceland Iceland is a small country with a population of about 300,700. According to the Central Intelligence Agency's *World Fact Book*:

> *Much of Iceland's economic growth in recent years came as the result of a boom in domestic demand following the rapid expansion of the country's financial sector. Domestic banks expanded aggressively in foreign markets, and consumers and businesses borrowed heavily in foreign-currency loans, following the privatization of the sector in the early 2000s. Worsening global financial conditions throughout 2008 resulted in a sharp depreciation of the krona vis-à-vis other major currencies. The foreign exposure of Icelandic banks, whose loans and other assets totaled more than 10 times the country's GDP, became unsustainable. Iceland's three largest banks collapsed in late 2008.*[45]

The main source of the boom was financial leverage. "The country became a giant hedge fund. And once-restrained Icelandic households amassed debts exceeding 220% of disposable income—almost twice the proportion of American consumers."[46]

What is the right amount of leverage? Harry Markowitz (2009) said: "Excessive leverage is bad: too many illiquid assets are dangerous; and writing insurance against correlated risks without reinsuring, or without quite large reserves, is an accident waiting to happen." He goes on to say: "More generally, evaluating risks one at a time rather than considering them as a portfolio is an all-too-common error." That brings us to our next lesson: diversification.

Lesson 2: Diversification Is Good; High Loan Concentrations Are Bad for Banks

Colonial Bank Bobby Lowder created Colonial Bank in 1981 by acquiring a failed community bank, Southland Bancorp. His strategy was to build his deposit base by acquiring community banks and by investing primarily in real estate loans.[47] The strategy was successful for many years. Colonial took advantage of the booming real estate markets in Florida, Georgia, and Nevada. It operated 354 branches in Florida (57 percent of the branches), Alabama (26 percent), Georgia (5 percent), Nevada (6 percent), and Texas (6 percent).[48] The Colonial BancGroup, headquartered in Montgomery, Alabama, had more than $26 billion in assets when it failed in 2009.

In 2008, 85 percent of Colonial's loan portfolio was real estate loans: commercial real estate (34 percent), real estate construction (33 percent), and residential real estate (18 percent) loans.[49] In June 2009, commercial real estate loans were about 595 percent of Colonial's capital, and construction and development loans were 274 percent. When the real estate bubble burst, it did not take many loan losses to wipe out Colonial's capital.

Diversification means investing in assets whose returns are not perfectly positively correlated. Unfortunately for Colonial, the entire real estate market in the United States was adversely affected by the financial and economic crisis. The states that suffered the most were those that had the greatest population growth. They included Florida, Georgia, and Nevada, where Colonial's branches were located.

Colonial was the fifth largest bank failure in U.S. history. In August 2009, it was acquired by BB&T Corp., based in Winston Salem, North Carolina.

A significant number of the banks that failed during the 2007–2009 period had high concentrations of construction and land development loans that were secured by real estate. Such loans are made to finance the

construction of new structures, additions, alterations, or demolitions to make way for new structures. They also depended heavily on brokered deposits.

Lesson 3: Loans Made to High-Risk Borrowers Are Risky

Subprime Borrowers and Mortgages The financial crisis that began 2007 is commonly associated with subprime loans, but it also involved *Alt-A mortgages* (i.e., alternative A-rated mortgages). Alt-A mortgages are riskier than prime-rated mortgages but less risky than subprime mortgages. Alt-A mortgages may lack full documentation, have higher loan-to-value ratios and debt-to-income ratios, or have other features that do not conform to GSEs' lending guidelines.

The delinquency on all residential real estate loans made by commercial banks soared from 1.6 percent in 2005 to 9.8 percent in the third quarter of 2009.[50] Similarly, the charge-off rates for commercial real estate loans increased from 1 percent to 8.7 percent.

The delinquency rate for prime ARMs on one- to four-unit residential properties in March 2005 was 2 percent.[51] By March 2009, it had increased to 12 percent. In contrast, delinquent subprime ARMs during that same period almost tripled, soaring from about 10 percent to 27.6 percent.[52]

Taking on too much risk is bad, but so is not taking on any risk. How much risk should lenders take?

Lesson 4: Be Aware of Interest Rate Risk

Rising Interest Rates Banks and other types of depository institutions generally finance their long-term assets with shorter-term liabilities. They profit from the difference between making long-term loans at high rates of interest and borrowing shorter-term funds at lower rates of interest. The difference between the two rates, called the net interest margin (NIM), is usually about 3 percent to 4 percent.

The Savings and Loan (S&L) crisis of the 1980s was due to the fact that long-term mortgage loans were made at low fixed rates, and they were financed with short-term deposits. Then market rates of interest soared to record levels. During the 1976–December 1981 period, 30-day CD rates increased from 5.08 percent to 15.94 percent, resulting in negative NIMs because of fixed-rate loans made at lower rates.[53]

Between 1980 and 1994, 1,600 banks and savings institutions failed. As previously noted, mortgage rates of interest peaked at 16.5 percent in 1981 and then declined to less than 5 percent in November 2009. Banks and other lenders that make fixed-rate mortgage loans when market rates

of interest are low and then hold those loans instead of selling them will be subject to interest rate risk (i.e., negative NIMs) when market rates of interest rise.

Interest rate risk can be mitigated by hedging with interest rate swaps or other instruments. There were 8,099 FDIC-insured institutions in the United States in the third quarter of 2009.[54] However, only "1,110 insured U.S. commercial banks reported derivatives activities at the end of the second quarter. . . . Nonetheless, most derivatives activity in the U.S. banking system continues to be dominated by a small group of large financial institutions. Five large commercial banks represent 97% of the total banking industry notional amounts and 88% of industry net current credit exposure."[55]

Lenders can also mitigate their interest rate risk by selling the long-term fixed-rate loans to investors or government-backed entities, such as Fannie Mae and Freddie Mac, that are willing to hold them.

Another issue involving interest rates concerns fair value accounting, in which the assets and liabilities reflect market prices. Simply stated, an increase in market rates of interest will reduce the value of long-term bank assets more than short-term liabilities, resulting in lower bank equity capital. This issue is explained in more detail in Chapter 8.

Lesson 5: We Are Globally Interconnected

The financial crisis in Greece in 2010 had global impacts. One reason is that Greece is part of the European Union (EU) that includes 27 countries that share a common currency the euro. Greece's economic problems had a negative impact on the value of the euro. That, in turn, affects all countries, including the United States, that have international trade relations with the EU. For example, a fall in the value of the euro has a negative effect on the value of the dollar because it is more expensive for EU countries to import goods and services from the United States. Thus, we are globally interconnected by trade, exchange rates, and financial markets. "A key lesson of the crisis is that keeping the economy in order does not necessarily insulate it from external shocks."[56]

Lesson 6: Real Estate Bubbles Will Probably Occur Again

Real estate bubbles are not limited to the United States. There were real estate bubbles in Japan, Spain, Sweden, and Thailand in the 1990s.[57] The most recent bubble in a foreign country was in Dubai.

Dubai Dubai is one of the seven United Arab Emirates (UAE), and it is located on the Persian Gulf coast. Dubai has a population of about

2.6 million. In 2000, if not before, Dubai began to engage in large-scale real estate projects with the intent of diversifying its economy and becoming a tourist destination and a global financial center. The large-scale real estate projects include one of the world's tallest skyscrapers (the Emirates Towers), the most expensive hotel (Burj Al Arab), and large residential projects (Palm Islands, built into the gulf).

The basic idea was to build the real estate projects and then people would come and buy or occupy them. However, the financial crisis that began in the United States in 2007, falling oil prices, and tighter credit had a chilling effect on Dubai's real estate projects. Some of the projects faltered, and the bubble burst.

The projects were run by Dubai's state-owned investment company, Dubai World. It wanted to restructure $26 billion in debt owed to global investors.[58] The global investors were surprised to learn that the Dubai government would not guarantee Dubai World's debts.[59] Investors with large exposures to Dubai World's debt included Abu Dhabi Commercial Bank,[60] Royal Bank of Scotland Group (UK), HSBC Holdings (UK), Barclays (UK), Lloyds Banking Group (UK), Standard Chartered (UK), and ING Group (the Netherlands). Collectively, European banks had about $84 billion in exposure to UAE banks, including Dubai.[61]

Like previous real estate bubbles, the one in Dubai was financed with debt. But in this case, investors made the incorrect assumption about the quality of the debt. Thus, the risks associated with financial leverage are compounded by the quality of the debt.

The U.S. Population The population of the United States continues to grow. In January 2010, the population was 307 million.[62] The population is expected to increase to 439 million by 2050.[63] In other words, the demand for housing is going to continue to grow. Where are the additional 130 million people going to live? Is it going to fuel the next real estate bubble?

Lesson 7: Scotoma

Scotoma is a term used by psychologists that means a culturally induced blind spot. For example, in the 1400s, everyone believed that the world was flat and that if you went too far, you would fall off the edge. When Columbus went to the bank to borrow money for an expedition around the world, the banker refused. Who in their right mind would lend money to finance someone who was going to fall off the edge of the world? Today, most people know that the world is not flat. Nevertheless, each of us has scotomas. What they are and how they will affect future economic expansions and contractions are open for debate. Or are they? A 2003 study by experts at

the Federal Reserve Bank of Chicago and a World Bank conference on asset price bubbles—long before the most recent crisis—concluded that:[64]

- Asset price bubbles are difficult to identify ex ante.
- Not all bubbles lead to economic crises.
- Bubbles occur with greater frequency in emerging economies than in developed economies.
- Countries that suffer longer and more destabilizing bubbles tend to have poor transparency, weak macroeconomic policies, and lack of diversification in their economies.