

PART

One

Bubbles and Crises: The Global Financial Crisis of 2007–2009

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CHAPTER 1**Setting the Stage for
Financial Meltdown****INTRODUCTION**

In this first chapter we outline in basic terms the underlying mechanics of the ongoing financial crisis facing the financial services industry, and the challenges this creates for future credit risk models and modelers.

Rather than one crisis, the current financial crisis actually comprises three separate but related phases. The first phase hit the national housing market in the United States in late 2006 through early 2007, resulting in an increase in delinquencies on residential mortgages. The second phase was a global liquidity crisis in which overnight interbank markets froze. The third phase has proved to be the most serious and difficult to remedy and was initiated by the failure of Lehman Brothers in September 2008. The lessons to be learned for credit risk models are different for each of these phases. Consequently, we describe first how we entered the initial phase of the current crisis. In the upcoming chapters, we discuss the different phases and implications of the global financial crisis that resulted from the features that characterized the run-up to the crisis.

THE CHANGING NATURE OF BANKING

The traditional view of a bank is that of an institution that issues short-term deposits (e.g., checking accounts and certificates of deposit) that are used to finance the bank's extension of longer-term loans (e.g., commercial loans to firms and mortgages to households). Since the traditional bank holds the loan until maturity, it is responsible for analyzing the riskiness of the borrower's activities, both before and after the loan is made. That is, depositors delegate the bank as its monitor to screen which borrowers should receive

loans and to oversee whether risky borrowers invest loan proceeds in economically viable (although not risk-free) projects see Diamond [1984].

In this setting, the balance sheet of a bank fully reflects the bank's activities. The bank's deposits show up on its balance sheet as liabilities, whereas the bank's assets include loans that were originated by the bank and are held to maturity. Despite the simplicity of this structure, traditional banking is not free of risk. Indeed, the traditional model tended to expose the bank to considerable liquidity risk, interest rate risk, and credit risk. For example, suppose a number of depositors sought to withdraw their deposits simultaneously. In order to meet depositors' withdrawals the bank would be forced to raise cash, perhaps by liquidating some assets. This might entail the selling of illiquid, long-term loans at less than par value. Thus, the bank might experience a market value loss because of the liquidity risk associated with financing long-term, illiquid assets (loans) with short-term, readily withdrawable liabilities (deposits).

With respect to interest rate risk in the traditional banking model, a good example occurred in the early 1980s when interest rates increased dramatically. Banks and thrift institutions found that their long-term fixed-rate loans (such as 30 year fixed-rate mortgages) became unprofitable as deposit rates rose above mortgage rates and banks earned a negative return or spread on those loans.

The traditional banking model has always been vulnerable to credit risk exposure. Since traditional banks and thrifts tended to hold loans until maturity, they faced the risk that the credit quality of the borrower could deteriorate over the life of the loan.

In addition to the risk exposures inherent in traditional banking, regulatory requirements began to tighten in the late 1980s and early 1990s. For example, the Basel I capital regulations requirement (the so-called 8 percent rule) set risk-based capital standards that required banks to hold more capital against risky loans and other assets (both off and on the balance sheet). Capital is the most expensive source of funds available to banks, since equity holders are the most junior claimants and are viewed as the first line of defense against unexpected losses. When the risk of losses increases and additional capital is required, the cost of bank funds increases and bank profitability falls.

As a result, the traditional banking model offered an insufficient return (spread) to compensate the bank for assuming these substantial risk exposures. Consequently, banks increasingly innovated by creating new instruments and strategies in an attempt to reduce their risks and/or increase their returns. These strategies are of much relevance in understanding the first (credit crisis) phase of the 2007–2009 crisis. Most important among these strategies were: (1) securitization of nonstandard mortgage assets;

(2) syndication of loans; (3) proprietary trading and investment in non-traditional assets, such as through the creation of hedge funds; and (4) increased use of derivatives like credit default swaps to transfer risk from a bank to the market at large.

Securitization

Securitization involves a change in strategy from a traditional bank's policy of holding the loans it originates on its balance sheet until maturity. Instead, securitization consists of packaging loans or other assets into newly created securities and selling these asset-backed securities (ABSs) to investors. By packaging and selling loans to outside parties, the bank removes considerable liquidity, interest rate, and credit risk from its asset portfolio. Rather than holding loans on the balance sheet until maturity, the originate-to-distribute model entails the bank's sale of the loan and other asset-backed securities shortly after origination for cash, which can then be used to originate new loans/assets, thereby starting the securitization cycle over again. The Bank of England reported that in the credit bubble period, major UK banks securitized or syndicated 70 percent of their commercial loans within 120 days of origination.¹ The earliest ABSs involved the securitization of mortgages, creating collateralized mortgage obligations (CMOs).

The market for securitized assets is huge. Figure 1.1 shows the explosive growth in the issuance of residential mortgage-backed securities (RMBSs) from 1995 to 2006, in the period just prior to the 2007–2009 crisis. Indeed, Figure 1.2 shows that, as of the end of 2006, the size of the RMBS market exceeded the size of global money markets. While the markets for collateralized loan obligations (CLOs) and collateralized debt obligations (CDOs) were smaller than for RMBS, they had also been rapidly growing until the current crisis.² Figure 1.3 shows the volume of CDO issuance in Europe and the United States during the 2004 through September 2007 period. The three-year rate of growth in new issues from 2004 through 2006 was 656 percent in the U.S. market and more than 5,700 percent in the European market.

The basic mechanism of securitization is accomplished via the removal of assets (e.g., loans) from the balance sheets of the banks. This is done by creating off-balance-sheet subsidiaries, such as a bankruptcy-remote special-purpose vehicle (SPV, also known as special-purpose entity, or SPE) or a structured investment vehicle (SIV). Typically, the SPV is used in the more traditional form of securitization. In this form, a bank packages a pool of loans together and sells them to an off-balance-sheet SPV—a company that is specially created by the arranger for the purpose of issuing the new securities.³ The SPV pools the loans together and creates new securities backed by

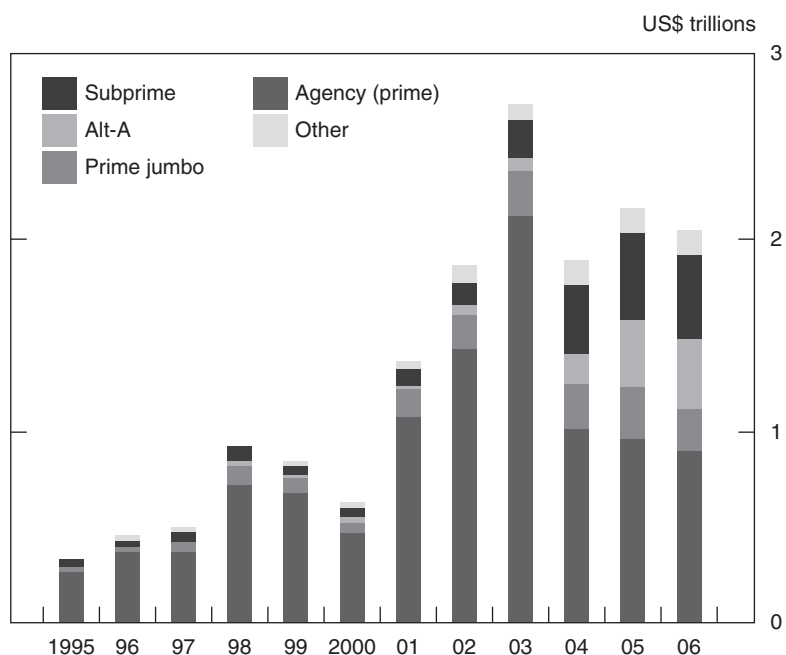


FIGURE 1.1 U.S. Residential Mortgage-Backed Securities Issuance

Note: Issuance is on a gross basis.

Source: Bank of England, *Financial Stability Report* no. 22, October 2007, page 6.

the cash flows from the underlying asset pool. These asset-backed securities can be based on mortgages, commercial loans, consumer receivables, credit card receivables, automobile loans, corporate bonds (CDOs), insurance and reinsurance contracts (Collateralized Insurance Obligations, CIOs), bank loans (CLOs), and real estate investment trust (REIT) assets such as commercial real estate (CRE CDOs).

Figure 1.4 illustrates this traditional form of securitization. The SPV purchases the assets (newly originated loans) from the originating bank for cash generated from the sale of ABSs. The SPV sells the newly created asset-backed securities to investors such as insurance companies and pension funds. The SPV also earns fees from the creation and servicing of the newly created asset-backed securities. However, the underlying loans in the asset pool belong to the ultimate investors in the asset-backed securities. All cash flows are passed through the SPV and allocated according to the terms of each tranche to the ultimate investors.⁴ The SPV acts as a conduit to sell the securities to investors and passes the cash back to the originating bank. The ABS security investor has direct rights to the cash flows on the underlying

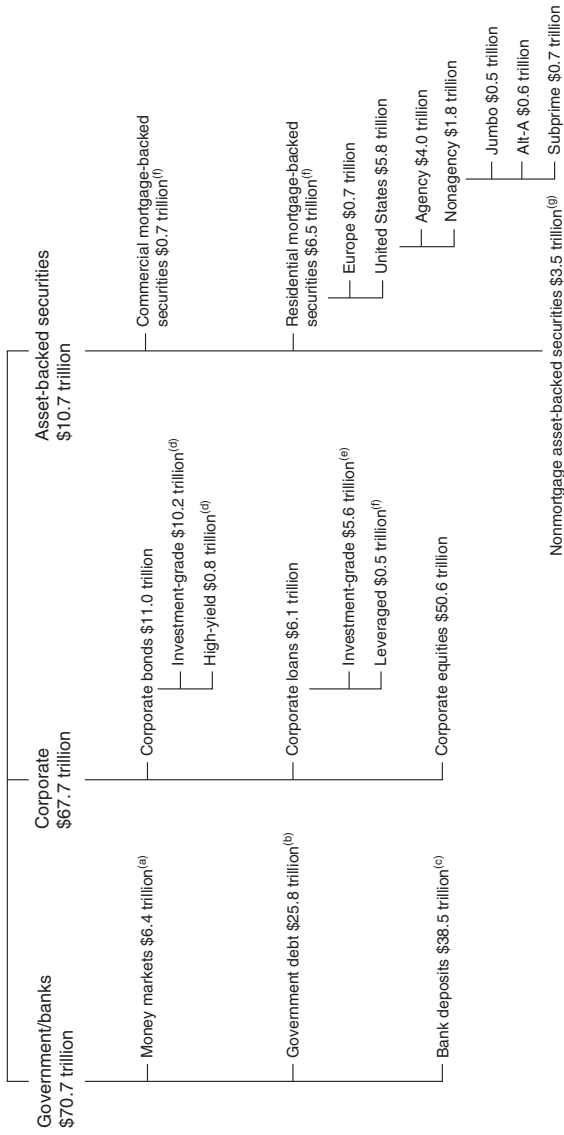


FIGURE 1.2 Size of Global Securities Markets

Note: All data are global at end of 2006 unless otherwise stated.

- ^a Euro area, the United Kingdom, the United States, and international money market instruments outstanding.
- ^b Excludes local government debt and government agency debt. In the United States, for example, agency and municipal debt totaled \$4.6 trillion at 2007 end-Q1.
- ^c End of 2005 except for the United Kingdom and the United States.
- ^d Aggregate of Africa, Europe, the Middle East, and the United States.
- ^e Aggregate of Euro area, the United Kingdom, and the United States.
- ^f Aggregate of Europe and the United States.
- ^g Aggregate of Europe and the United States. Includes securitized home equity loans, auto loans, consumer loans, credit card debt, student loans, and other sorts of nonmortgage loans.

Source: Bank of England, *Financial Stability Report* no. 22, October 2007, page 20.

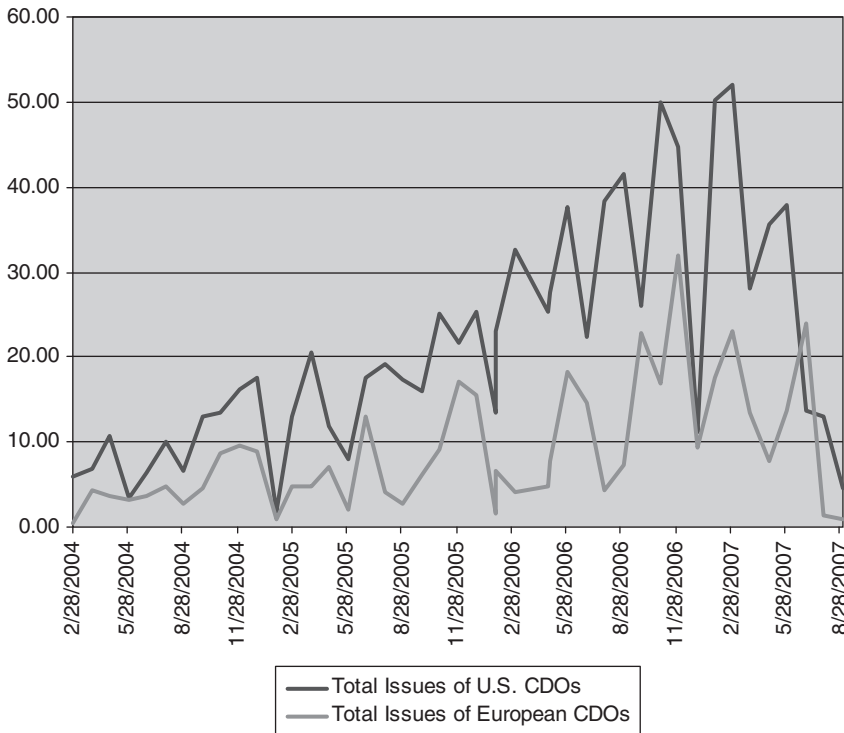


FIGURE 1.3 U.S. and European CDO Issuance 2004–2007
Source: Loan Pricing Corporation web site, www.loanpricing.com/.

assets. Moreover, the life of the SPV is limited to the maturity of the ABS. That is, when the last tranche of the ABS is paid off, the SPV ceases to exist.

While this method of securitization was lucrative, financial intermediaries soon discovered another method that was even more lucrative. For this form of securitization, an SIV is created. In this form, the SIV's lifespan is not tied to any particular security. Instead, the SIV is a structured operating company that invests in assets that are designed to generate higher returns than the SIV's cost of funds. Rather than selling the asset-backed securities directly to investors in order to raise cash (as do SPVs), the SIV sells bonds or commercial paper to investors in order to raise the cash to purchase the bank's assets. The SIV then holds the loans purchased from the banks on its own balance sheet until maturity. These loan assets held by the SIV back the debt instruments issued by the SIV to investors. Thus, in essence the SIV itself becomes an asset-backed security, and the SIV's commercial paper liabilities are considered asset-backed commercial paper (ABCP).

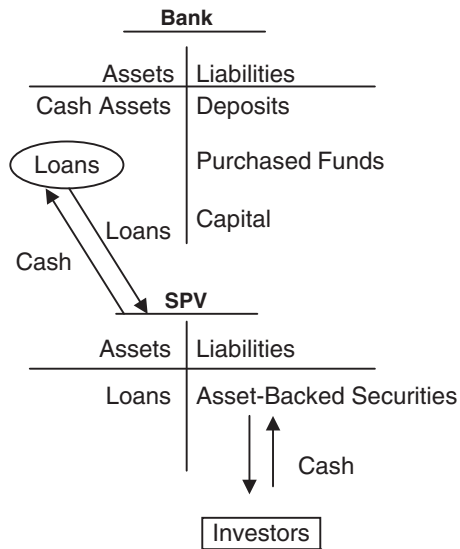


FIGURE 1.4 The Traditional Securitization Process

Figure 1.5 shows the structure of the SIV method of asset securitization. Investors buy the liabilities (most often, asset-backed commercial paper) of the SIV, providing the proceeds for the purchase of loans from originating banks. The SIV's debt (or ABCP) is backed by the loan or asset portfolio held by the SIV. However, the SIV does not simply pass through the payments on the loans in its portfolio to the ABCP investors. Indeed, investors have no direct rights to the cash flows on the underlying loans in the portfolio; rather, they are entitled to the payments specified on the SIV's debt instruments. That is, the SIV's ABCP obligations carry interest obligations that are independent of the cash flows from the underlying loan/asset portfolio. Thus, in the traditional form of securitization, the SPV only pays out what it receives from the underlying loans in the pool of assets backing the ABS.

In the newer form of securitization, the SIV is responsible for payments on its ABCP obligations whether the underlying pool of assets generates sufficient cash flow to cover those costs. Of course, if the cash flow from the asset pool exceeds the cost of ABCP liabilities, then the SIV keeps the spread and makes an additional profit. However, if the assets in the underlying pool do not generate sufficient cash flows, the SIV is still obligated to make interest and principal payments on its debt instruments. In such a situation the SIV usually has lines of credit or loan commitments from the sponsoring bank. Thus, ultimately, the loan risk would end up back on the sponsoring bank's balance sheet.⁵

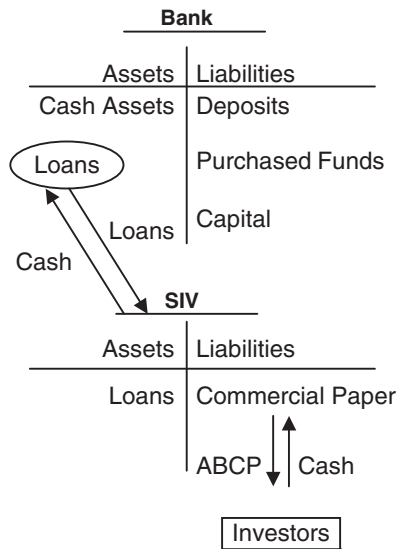


FIGURE 1.5 A New Securitization Process

Because of the greater expected return on this newer form of securitization, it became very popular in the years leading up to the financial crisis. Whereas an SPV only earns the fees for the creation of the asset-backed securities, the SIV also earns an expected spread between high-yielding assets (such as commercial loans) and low-cost commercial paper as long as the yield curve is upward-sloping and credit defaults on the asset portfolio are low. Indeed, because of these high potential spreads, hedge funds owned by Citicorp and Bear Stearns and others adopted this investment strategy. Until the 2007–2009 crisis, these instruments appeared to offer investors a favorable return/risk trade-off (i.e., a positive return) and an apparently small risk given the asset-backing of the security.

The balance sheet for an SIV in Figure 1.5 looks remarkably similar to the balance sheet of a traditional bank. The SIV acts similarly to a traditional bank—holding loans or other assets until maturity and issuing short-term debt instruments (such as ABCP) to fund its asset portfolio. The major difference between an SIV and a traditional bank is that the SIV cannot issue deposits to fund its asset base (i.e., it's not technically a *bank*).

However, to the extent that many SIVs used commercial paper and interbank loans (such as repurchase agreements or repos)⁶ to finance their asset portfolios, they were subject to even more liquidity risk than were traditional banks. A first reason for this is that in the modern financial market, sophisticated lenders (so-called suppliers of *purchased funds*) are

prone to *run* at the first sign of trouble, whereas small depositors are slower to react. That is, interbank lenders and commercial paper buyers will withdraw funds (or refuse to renew financing) more quickly than traditional core depositors, who may rely on their bank deposits for day-to-day business purposes.

Second, bank deposits are explicitly insured up to \$250,000 and, for those in banks viewed as too big to fail, a full implicit 100 percent. Thus, the liquidity risk problems were exacerbated by the liquidity requirements of the SIVs that relied on short-term sources of funding, such as commercial paper, which had to be renewed within nine months, and repurchase agreements, which must be fully backed by collateral at all points in time in the absence of a deposit insurance umbrella. Consequently, if the value of its portfolio declined due to deterioration in credit conditions, the SIV might be forced to sell long-term, illiquid assets in order to meet its short-term liquid debt obligations. In the next chapter, we show that this was a key part of the contagion mechanism by which the subprime market credit crisis was transmitted to other markets and institutions during the crisis.

Loan Syndication

Whereas packaging and selling loans to off-balance-sheet vehicles is one mechanism banks have found to potentially reduce their risk exposures, a second mechanism has been the increased use of loan syndication. A loan is syndicated when a bank originates a commercial loan, but rather than holding the whole loan, the originating bank sells parts of the loan (or *syndicates* it) to outside investors. Thus, after a syndication is completed, a bank may retain only 20 percent of the loan (with its associated risk exposure) while transferring the remaining part of the loan, in this case 80 percent, to outside investors. Traditionally these outside investors were banks, but the range of buyers has increasingly included hedge funds, mutual funds, insurance companies, and other investors. Figure 1.6 shows that dating back to the early 2000s, nonbank institutional investors comprised more than 50 percent of the syndicated bank loan market.

The originating bank in a loan syndication is called the *lead arranger* (or *lead bank*). Typically, the lead arranger lines up the syndicate members before the loan is finalized so that the originating bank only *warehouses* the loan for a short time, often only a few days. In a loan syndication, the lead bank (also known as the *agent* or *arranger*) and the borrower agree on the terms of the loan, with regard to the coupon rate, the maturity date, the face value, collateral required, covenants, and so on.⁷ Then the lead bank assembles the syndicate, together with other lenders, called *participants*. Figure 1.7 illustrates the syndication process.

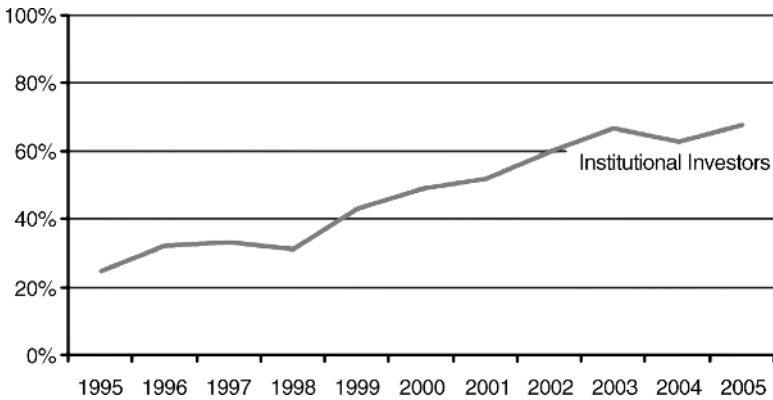


FIGURE 1.6 Composition of Loan Investors in the Syndicated Bank Loan Market
 Source: V. Ivashina and A. Sun, “Institutional Stock Trading on Loan Market Information,” Harvard Business School Working Paper, August 2007, Figure 1.1.

Syndicates can be assembled in one of three ways:

- *Firm commitment (underwritten) deals.* The lead bank commits to making the loan in its entirety, warehouses it, and then assembles participants to reduce its own loan exposure. Thus, the borrower is guaranteed the full face value of the loan.
- *Best efforts deals.* The size of the loan is determined by the commitments of banks that agree to participate in the syndication. The borrower is not guaranteed the full face value of the loan.
- *Club deals.* For small deals (usually \$200 million or less), the loan is shared among banks, each of which has had a prior lending relationship with the borrower.

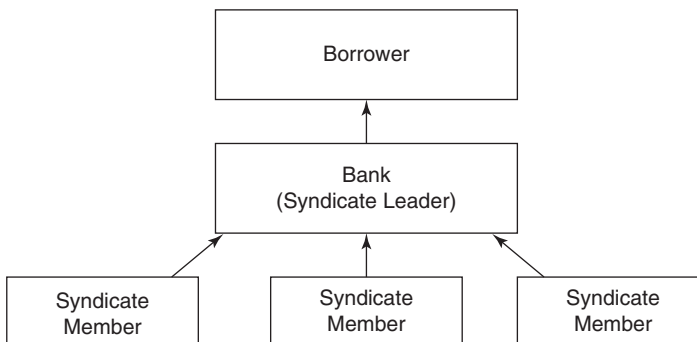


FIGURE 1.7 Syndicated Lending

Note: The arrows reflect the direction of the flow of funds.

The loan's risk determines the terms of the syndicated loan. Primary market pricing of the loan at the issuance stage typically consists of setting the loan's coupon rate. Most syndicated loans are floating rate loans tied to a market benchmark such as the London Interbank Offered Rate (LIBOR) or the U.S. prime rate. LIBOR is the cost of short-term borrowings on the overseas interbank U.S. dollar market for prime bank borrowers. The U.S. prime rate is the base interest rate set on loans for a bank's borrowers, although the bank can offer loans at rates below prime to its very best customers if it so chooses.

Investment-grade loan syndications are made to borrowers rated BBB-/Baa3 or higher.⁸ Coupon rates for investment-grade loans are typically set at LIBOR plus 50 to 150 basis points.⁹ Leveraged loans are non-investment-grade loans made to highly leveraged borrowers often with debt to EBIT ratios exceeding 4:1. Because of the greater risk of default, coupon rates on leveraged loans are generally set much higher than for investment-grade loans. Syndicated leveraged loans are often pooled together and securitized in the form of CLOs.

Once the terms of the loan syndication are set, they cannot be changed without the agreement of the members of the loan syndicate. Material changes (regarding interest rates, amortization requirements, maturity term, or collateral/security) generally require a unanimous vote on the part of all syndicate participants. Nonmaterial amendments may be approved either by a majority or super-majority, as specified in the contractual terms of the loan syndication. The assembling and setting of the terms of a loan syndication are primary market or *originating* transactions. After the loan syndication is closed, however, syndicate members can sell their loan syndication shares in the secondary market for syndicated bank loans.¹⁰

While syndicated lending has been around for a long time, the market entered into a rapid growth period in the late 1980s, as a result of the banks' activity in financing takeovers, mergers, and acquisitions. At that time, there was also a wave of leveraged buyouts (LBOs) in which managers and investors in a firm borrow money in order to buy out the public equity of the company, thereby taking it private. When a takeover, acquisition, or LBO is financed using a significant amount of bank loans, it is often a highly leveraged transaction. These deals fueled the first major growth wave in the syndicated bank loan market during the early 1990s. This growth stage was ended, however, by the credit crisis brought on by the July 1998 default on Russian sovereign debt and the near-default of the Long Term Capital Management hedge fund in August 1998. The annual growth in trading volume in the secondary syndicated bank loan market was 53.52 percent in 1996–1997, 27.9 percent in 1997–1998, and only 1.99 percent in 1998–1999, according to the Loan Pricing Corporation (LPC) web site. The

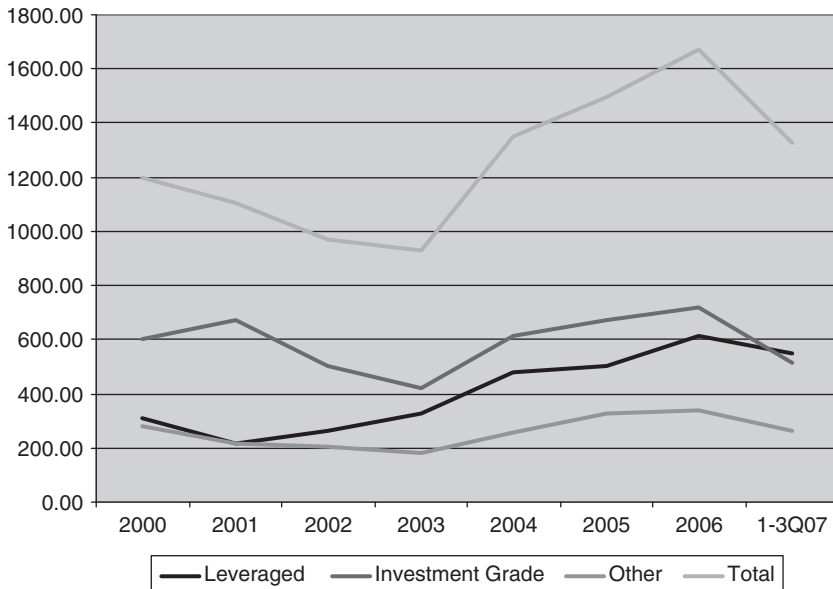


FIGURE 1.8 Syndicated Bank Loan Market Activity, 2000–2007

Source: Loan Pricing Corporation web site, www.loanpricing.com/.

bursting of the high-tech bubble in 2000–2001 and the subsequent recession caused even further declines in syndicated bank loan market activity.

After annual declines in syndicated bank loan issuance during 2000–2003 (see Figure 1.8), the syndicated market recovered in 2004–2006. Total syndicated loan volume increased by 44.93 percent in 2004. Figure 1.8 shows that the market continued to grow until the year 2006. This growth was fueled by the expansion of credit for business growth and private equity acquisitions. However, the impact of the credit crisis is shown in the 20.53 percent decline in syndicated bank loan volume during the first three quarters of 2007.

Proprietary Investing

As traditional on-balance-sheet investing in loans became less attractive, both in terms of return and risk, banks continued to seek out other profit opportunities. This has taken the form of an increased level of trading of securities within the bank's portfolio—that is, buying and selling securities such as government bonds. In addition, banks established specialized off-balance-sheet vehicles and subsidiaries to engage in investments and

investment strategies that might be viewed as being too risky if conducted on their balance sheets. For example, banks established (through lending and/or equity participations) hedge funds, private equity funds, or venture funds.

Hedge funds, private equity funds, and venture funds are investment companies that have broad powers of investing and can often act outside the controls of regulators such as the Securities and Exchange Commission (SEC) that regulate most U.S.-based investment funds. Circumvention of regulatory oversight can be accomplished by establishing the fund in a favorable regulatory environment offshore (e.g., the Cayman Islands) and/or by restricting the number of investors in the fund. In general, a hedge fund with fewer than 100 investors, each of whom have been certified as having significant wealth and thus, by implication, investment sophistication, will be outside the regulatory oversight of the SEC or the Federal Reserve System.

It should be noted that the term *hedge fund* is often a misnomer. Many of these funds do not seek to hedge or reduce risk, but in fact do the reverse by seeking out new and potentially profitable investments or strategies to generate higher profits, often at considerable risk. The term *hedge fund* stems from the fact that these investment vehicles often are structured to benefit from mispricing opportunities in financial markets, and thus do not necessarily take a position on the overall direction of the market—in other words, they are neither long (buy) nor short (sell) assets, but are neutral (hedged), seeking to gain whether market prices move up or down. Many hedge funds invested in the asset-backed securitization vehicles originated by banks, discussed earlier: asset-backed commercial paper, CLOs, and CDOs. At the start of the 2007–2009 financial crisis, it was estimated that there were over 9,000 hedge funds in existence with over \$1 trillion in assets.¹¹ Banks are exposed to hedge funds through the provision of prime brokerage services such as trading and execution, clearance and custody, security lending, financing, and repurchase agreements, as well as through proprietary investing.

Credit Default Swaps

In recent years, there has been an explosive growth in the use of credit derivatives. Estimates in June 2001 put the market at approximately \$1 trillion in notional value worldwide. The Bank for International Settlements (BIS) reported the notional amount on outstanding over-the-counter (OTC) credit default swaps (CDS) to be \$28.8 trillion in December 2006, up from \$13.9 trillion as of December 2005 (an increase of 107 percent).¹² By 2008, estimates put the notional value over \$60 trillion. It is clear that the market

for credit derivatives has grown, and continues to grow, quite rapidly. While a majority of these OTC CDSs were single-name instruments, a large proportion were multiname CDSs involving baskets of credit instruments (see the discussion in Chapter 12).

The growth in trading of credit derivatives that are designed to transfer the credit risk on portfolios of bank loans or debt securities facilitated a net overall transfer of credit risk from banks to nonbanks, principally insurance and reinsurance companies. As will be shown in Chapter 12, banks, securities firms, and corporations tend to be net buyers of credit protection, whereas insurance companies, hedge funds, mutual funds, and pension funds tend to be net sellers. Insurance companies (and especially reinsurance companies) view credit derivatives as an insurance product, in which their relatively high credit ratings, often based on the profitability of their underlying casualty and life insurance business, can be used to insure the buyers of credit protection (e.g., banks) against risk exposure to their loan customers. Just as individuals may purchase home owners insurance or automobile insurance to protect themselves from losses from adverse events (such as fires or car accidents), CDS buyers purchase CDS contracts to protect themselves from losses resulting from adverse credit events (such as bankruptcy or default). The CDS seller insures the buyer against these losses.¹³ Once the largest insurance company in the world, AIG was heavily involved in issuing CDS contracts during the pre-crisis period, ultimately leading to its bailout by the U.S. government in September 2008.

Credit derivatives such as CDSs allow banks and other financial institutions to alter the risk/return trade-off of a loan portfolio without having to sell or remove loans from the bank's balance sheet. Apart from avoiding an adverse customer relationship effect (compared to when a bank sells a loan of a relationship borrower), the use of credit derivatives (rather than loan sales or securitization) may allow a bank to avoid adverse timing of tax payments as well as liquidity problems related to buying back a similar loan at a later date if risk/return considerations so dictate. Thus, for customer relationship, tax, transaction cost, and liquidity reasons, a bank may prefer the credit derivative solution to loan portfolio optimization rather than the more direct (loan trading) portfolio management solution. Banks can essentially rent out their credit portfolios to financial intermediaries that have capital but do not have large loan-granting networks.

By selling CDSs, the insurance company or, for example, foreign bank can benefit from the return paid for credit risk exposure without having to actually commit current resources to purchasing a loan. Moreover, usually the insurance company or foreign bank has no banking relationship with the borrower and, therefore, would find it costly to develop the appropriate monitoring techniques needed to originate and hold loans on the balance

sheet. This is not to imply that buying a credit derivative totally removes credit risk from a bank's balance sheet: As an example, the buyers of AIG's CDSs faced the counterparty risk that the seller, AIG, would default on its obligation to cover any credit losses incurred under the CDS contract, something that would probably have happened if AIG was not bailed out in September 2008.

The growing use of CDSs and other derivative instruments transfers risk across financial intermediaries. However, the use of derivatives engenders counterparty risk exposure, which may be controlled using margin and collateral requirements. Moreover, each institution sets a credit limit exposure for each counterparty. Not only may the collateral/margin protection mechanism break down if the seller of the insurance (CDS) cannot post sufficient collateral (as was the case for AIG in 2007–2008), Kambhu et al. (2007) note that these systems may also fail as a result of free-rider problems and negative externalities. For example, competition among CDS buyers may lead to inadequate monitoring of counterparty exposures as banks rely on each other to perform due diligence on the seller. Moral hazard concerns arise if banks undertake riskier positions under the assumption that they have hedged their exposure, and CDS protection may be fleeting if CDS market liquidity evaporates or asset correlations go to 1.0, as is typical during a financial crisis.

REENGINEERING FINANCIAL INSTITUTIONS AND MARKETS

The common feature uniting the four innovations previously discussed—securitization, loan syndication, proprietary investing, and growth of the credit default swap market—is that the balance sheet no longer reflects the bulk of a bank's activities or credit risk. Many of a bank's profit and risk centers lie off its balance sheet in SPVs or SIVs, hedge funds, and CDSs. Although bank regulators attempt to examine the off-balance-sheet activities of banks so as to ascertain their safety and soundness, there is far less scrutiny of off-balance-sheet activities than there is for their on-balance-sheet activities (i.e., traditional lending and deposit taking). To the extent that counterparty credit risk was not fully disclosed to or monitored by regulators, the increased use of these innovations transferred risk in ways that were not necessarily scrutinized or understood. It is in this context of increased risk and inadequate regulation that the credit crisis developed.

Before we turn, in the next chapter, to the incipient causes of the crisis, a discussion of how undetected risk could build up in the system is in order. Financial markets rely on regulators, credit rating agencies, and banks to

oversee risk in the system. We now describe how each of these failed to perform their function in the years leading up to the crisis.

Regulators

In 1992, U.S. bank regulators implemented the first Basel Capital Accord (Basel I).¹⁴ Basel I was revolutionary in that it sought to develop a single capital requirement for credit risk across the major banking countries of the world.¹⁵ Basel I has been amended to incorporate market risk (in 1996), as well as updated to remedy flaws in the original risk measurement methodology stemming from the inaccuracies in credit risk measurement (see the discussion in Chapter 13).

Toward the end of the 1990s, regulators recognizing the unintended risk-inducing consequences of some of the features of Basel I sought to amend the capital requirements. In 1999, the Basel Committee began the process of formulating a new capital accord (denoted Basel II) that was intended to correct the risk mispricing of loans under Basel I. After much debate, the proposal for Basel II was finalized in 2006, and subsequently adopted throughout the world. The global financial crisis of 2007–2009, however, revealed flaws in Basel II, and in January 2009 the Basel Committee suggested further changes that would increase risk weighting and make the system more sensitive to the risk exposure inherent in ABSs, CDSs, and the off-balance-sheet activity described in this chapter (see the discussion in Chapter 13).

Another regulatory change in the United States during this period was the passage of the Graham-Leach-Bliley (GLB) Act of 1999, which enables bank holding companies to convert to financial service holding companies (FSHCs). These FSHCs could combine commercial banking, securities broker-dealer activities, investment banking, and insurance activities under one corporate holding company umbrella, thereby encouraging the growth of universal banking in the United States. However, it is not clear that this deregulation has contributed in any meaningful way to the buildup of credit and other risks. Securitization and loan syndication were permitted activities for U.S. banks even under the Glass-Steagall Act of 1933 that preceded the passage of the GLB. Moreover, banks could always engage in proprietary trading strategies. Thus, the passage of the GLB Act did not materially affect banks' abilities to shift risk off their balance sheets, although it did add to the risk complexity of these organizations.

Credit Rating Agencies

Credit rating agencies are paid by issuers of securities to analyze risk and provide the results of their analysis to the general market in the form of

ratings. Indeed, credit rating agencies are exempt from fair disclosure laws (such as Regulation FD) that require all institutions to have the same access to material and forward-looking information.¹⁶ Thus, they are entitled to receive private information about the firms that issue debt instruments so as to use this information in formulating their ratings.

Many institutional investors (e.g., insurance companies and pension funds) rely on credit ratings in order to determine whether they can invest in particular debt issues. Specifically, many institutions are precluded by regulation or charter from buying below-investment-grade debt issues, rated below BBB- for S&P or below Baa3 for Moody's. Also, debt issues may specify covenants based on credit ratings that may trigger a technical violation if a borrower's credit rating falls below a certain level. Credit derivatives and insurance products utilize credit rating downgrades as a possible trigger for a credit event. Thus, credit ratings have become central features of global credit markets.¹⁷

The Securities Exchange Act of 1934 gave the SEC the ability to confer the designation of "Nationally Recognized Statistical Rating Organization" (NRSRO). Historically, these firms have been Moody's, S&P, and Fitch.¹⁸ This has created a virtual oligopoly that has reduced competitive pressures to improve rating accuracy and timeliness. For example, all three major rating agencies (Moody's, S&P, and Fitch) rated Enron investment-grade until just four days prior to its default on December 2, 2001. Perhaps in response to this type of failure, the SEC conferred the NRSRO certification on Dominion Bond Rating Service (of Toronto, Canada) in February 2003, and AM Best (focusing on the insurance and banking industries) received this designation in 2006. On December 21, 2007, Egan-Jones Ratings also received this designation.

As noted earlier, typically the rating agencies are paid by the debt issuer for their services. This has created a potential conflict of interest such that ratings agencies may be reluctant to act too aggressively to adjust their ratings downward for fear of offending issuing clients. The major ratings agencies have traditionally adopted a through-the-cycle methodology that smoothes ratings and prevents them from expeditiously adjusting their ratings to reflect new information, although more recently Moody's and Fitch have provided implied credit ratings as a new product based on CDS spreads, which are presumed to be more timely metrics of issuer credit risk.

By contrast, Egan-Jones Ratings (EJR) receives no fees from issuers, relying entirely on buyer or institutional investors such as hedge funds and pension funds to pay for their ratings. Thus, EJR ratings are more oriented toward providing timely information regarding valuation that is useful to the investment community. Beaver, Shakespeare, and Soliman (2006) have compared EJR ratings to Moody's ratings and find that EJR ratings lead

Moody's in both upgrades and downgrades. EJR ratings upgrades precede Moody's by an average of six months, and downgrades by between one and four months. Moreover, "EJR rating upgrades (downgrades) have a significantly larger positive (negative) contemporaneous [equity] abnormal return than does Moody's . . . consistent with EJR's investor orientation."¹⁹ These results are supported by those of Johnson (2003), who finds that EJR's downgrades for the lowest investment-grade rated issuers lead S&P's and occur in smaller steps. Thus, EJR's role in providing services to the buy-side investor community are reflected in its expeditious (*point-in-time*) incorporation of new information into ratings on a real-time basis. In contrast, Moody's and S&P play a contractual role in debt covenants and permissible portfolio investments and are thus more conservative and focused on incorporating negative information. Offering empirical support for this, Kim and Nabar (2007) use equity prices to examine Moody's bond ratings, and find that downgrades are timelier than upgrades.

During the current crisis the reputations of the three major credit rating agencies have been additionally harmed by their misrating of ABS tranches and the fact that they engaged in a potential conflict of interest in both helping to design the structure of ABS issues for a fee and then charging a fee for the publication of those ratings.²⁰ Indeed, in the fall of 2008 more than 2,000 ABSs had to be drastically downgraded as the credit risk assumptions employed in the ABS tranching were shown to be extremely optimistic.

Market Value Accounting

One of the oft-cited causes of the 2007–2009 financial crisis has been market value accounting, specifically Financial Accounting Standard (FAS) 157 which calls for fair value accounting. Under FAS 157, banks have to write down the value of their assets to reflect their lower market valuations during the market decline. Critics claim that since financial markets essentially were shut down, any market values were either speculative (since prices were often completely unavailable) or fire sale prices reflecting the extreme lack of market liquidity. Requiring banks to drastically write down the value of assets that they had no intention of selling had the impact of generating capital charges, which required banks to raise capital at the worst possible time, thereby creating a feedback effect that caused banks to hoard their liquidity and capital, which in turn exacerbated the downturn. Because of this, pressure to defer mark-to-market accounting treatment was successful in getting the Financial Accounting Standards Board (FASB) to vote on April 2, 2009, to allow companies to use "significant judgment" in valuing assets, thereby reducing the amount of write-downs they must take on impaired investments, including mortgage-backed securities.

Ryan (2008) correctly refocuses attention on the excessive risk taking and bad decision making that is really behind the crisis, as follows (pages 4–5):

The subprime crisis was caused by firms, investors, households making bad operating, investing and financing decisions, managing risks poorly, and in some instances committing fraud, not by accounting. While the aforementioned accounting-related feedback effects may have contributed slightly to market illiquidity, the severity and persistence of market illiquidity during the crisis is primarily explained by financial institutions' considerable risk overhang and need to raise capital, as well as by the continuing high uncertainty and information asymmetry regarding subprime positions. . . . The best way to stem the credit crunch and damage caused by these actions is to speed the price adjustment process by providing market participants with the most accurate and complete information about subprime positions. Although imperfect, fair value accounting provides better information about these positions and is a far better platform for mandatory and voluntary disclosures than alternative measurement attributes, including any form of amortized cost accounting.

Providing banks with the discretion to choose their own so-called fair value (or fairy tale valuation) is the opposite of accountability and objective standards of disclosure and risk measurement could have mitigated the severity of the 2007–2009 crisis.

SUMMARY

The years preceding the financial crisis that began in 2007 were characterized by a dramatic increase in systemic risk of the financial system, caused in large part by a shift in the banking model from that of “originate and hold” to “originate and distribute.” In the traditional model, the bank takes short-term deposits and other sources of funds and uses them to fund longer-term loans to businesses and consumers. The bank typically holds these loans to maturity, and thus has an incentive to screen and monitor borrower activities even after the loan is made. However, the traditional banking model exposes the institution to potential liquidity risk, interest rate risk, and credit risk.

In attempts to avoid these risk exposures and generate improved return/risk trade-offs, banks shifted to an underwriting model in which they

originate or warehouse loans, and then quickly sell them (i.e., distribute them to the market). There are several forms that the originate-and-distribute model takes. One is securitization, in which a bank packages loans into asset-backed securities such as mortgage-backed securities, collateralized debt obligations, collateralized loan obligations, and so on. Another is loan syndication, in which the lending bank organizes a syndicate to jointly make the loan. Along with the increasing trend toward off-balance-sheet proprietary investing and growth of credit derivatives, these innovations have the impact of removing risk from the balance sheet of financial institutions and shifting risk off the balance sheet. That is, risk is shifted to other parties in the financial system.

Since the underwriters of ABSs were not exposed to the ongoing credit, liquidity, and interest rate risks of traditional banking, they had little incentive to screen and monitor the activities of borrowers for whom they originated loans. The result was a deterioration in credit quality, at the same time that there was a dramatic increase in consumer and corporate leverage, which were not detected by regulators. The combination of the two permitted the undetected buildup of risk in the financial system that created the preconditions for a credit bubble. In Chapter 2, we describe the credit bubble buildup and its bursting, as reflected in the post-2007 credit crisis.

APPENDIX 1.1: RATINGS COMPARISONS FOR THE THREE MAJOR RATING AGENCIES

Table 1.1 shows how Standard & Poor's ratings can be mapped onto comparable Moody's and Fitch IBCA ratings.

TABLE 1.1 Mapping of Standard & Poor's, Moody's, and Fitch IBCA Credit Ratings

Standard & Poor's Credit Rating	Moody's Credit Rating	Fitch IBCA Credit Rating
AAA	Aaa	AAA
AA+	Aa1	AA+
AA	Aa2	AA
AA–	Aa3	AA–
A+	A1	A+
A	A2	A
A–	A3	A–

Standard & Poor's Credit Rating	Moody's Credit Rating	Fitch IBCA Credit Rating
BBB+	Baa1	BBB+
BBB	Baa2	BBB
BBB-	Baa3	BBB-
BB+	Ba1	BB+
BB	Ba2	BB
BB-	Ba3	BB-
B+	B1	B+
B	B2	B
B-	B3	B-
CCC+	Caa1	CCC+
CCC	Caa2	CCC
CCC-	Caa3	CCC-
CC	Ca	CC
C	C	C
D		D

Source: Bank for International Settlements, "Long-Term Rating Scales Comparison," April 30, 2001, www.bis.org.