PART

One

Key Structures and Cash Flow Dynamics

CHAPTER 1

Mortgage-Backed Securities: Origins of the Market

Mortgage-backed securities have an array of cash-flow profiles and risk profiles. The most basic mortgage-backed security is the pass-through security. As its name indicates, a pass-through simply passes to investors the payments associated with a pool of amortizing mortgages. The pass-through is the basic building block of the mortgage-backed securities (MBS) market. In this chapter we will describe the process of securitization, the output of the process, and the market for the output: mortgage-backed securities. The MBS market in the United States was kick-started and has been sustained by the activities of Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC). The first MBS guaranteed by GNMA was issued in 1970. FNMA securitized its first pool in 1981, and Freddie Mac issued the first collateralized mortgage obligation (CMO), backed by 30-year fixed-rate mortgages, in 1983.[1] The pool was refinanced with the issue of three classes of securities that matured sequentially. Over time the number of classes issued to finance a pool of mortgages increased, and the design of the classes became more intricate and more leveraged with respect to various components of risk.

This more extensive refining of risk offered important opportunities to both sides of the financial markets, but also became a destabilizing factor when a significant flow of MBSs/ABSs backed by badly underwritten assets were overvalued. Periods of market turmoil such as the third quarter of 1998 and the years 2007 to 2009 drove investors away from risk and illiquid securities toward safer and more liquid securities. In the case of the non-agency or private label market for MBS market, turmoil would force banks to hold mortgages for longer than expected and would depress the values of leveraged classes—in this case tranches of MBSs—with the most exposure to credit, prepayment, and interest rate risk. When banks must hold mortgages longer than was expected, this uses up capital that would otherwise have been used to extend new credit. When investors cannot sell or adjust their

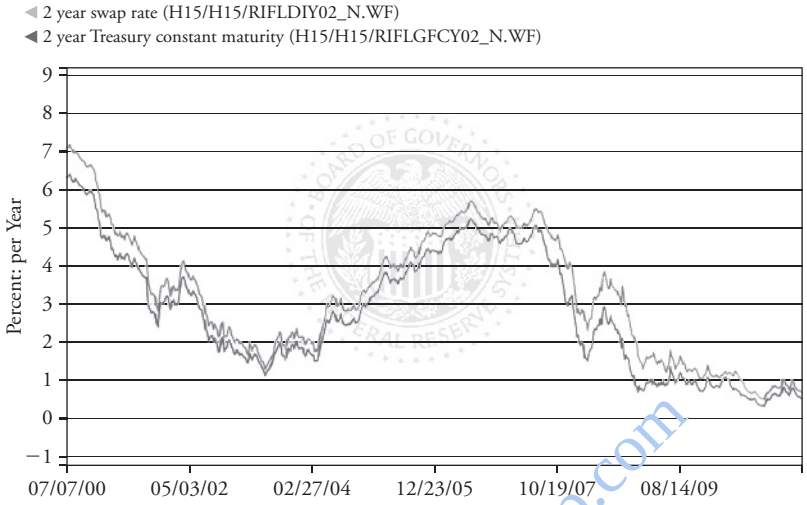


EXHIBIT 1.1 Two-Year Swap Rate versus Two-Year Constant Maturity Treasury
Source: Federal Reserve Board, 2011.

positions due to the illiquidity of the securities they hold, capital is tied up. This was the case on a small scale in 1998 when Russia defaulted on its debt and Long-Term Capital Management (LTCM) subsequently became insolvent as interest rate spreads moved dramatically against the hedge fund's positions. The flight from risk was profoundly larger and more sustained from 2007 to 2009. Exhibit 1.1 shows this dynamic in the widening spreads.

We look at the brief period between Q1 2004 and Q2 2009. Over this period mortgage credit was expanding until Q2 2006 and then actually became negative in Q2 2008. A negative reading means that more mortgage credit was being repaid or defaulting than was being originated. This is evident from Exhibit 1.2.

Over this same period we observe that the mortgage assets on the balance sheets of commercial banks increased relative to those funded by securitization vehicles, "issuers of asset-backed securities, home mortgage asset" in the flow-of-funds accounts.[2] The increase in mortgage assets over this period was erratic and it is hard to explain this without deeper analysis. Over this period commercial banks were consolidating structured investment vehicles (SIVs) and asset-backed commercial paper (ABCP) assets onto their balance sheets as banks frequently became the special purpose vehicle's (SPV's) primary beneficiary as liquidity and credit lines were called upon. An addition to mortgage assets was also due to the freezing up of the

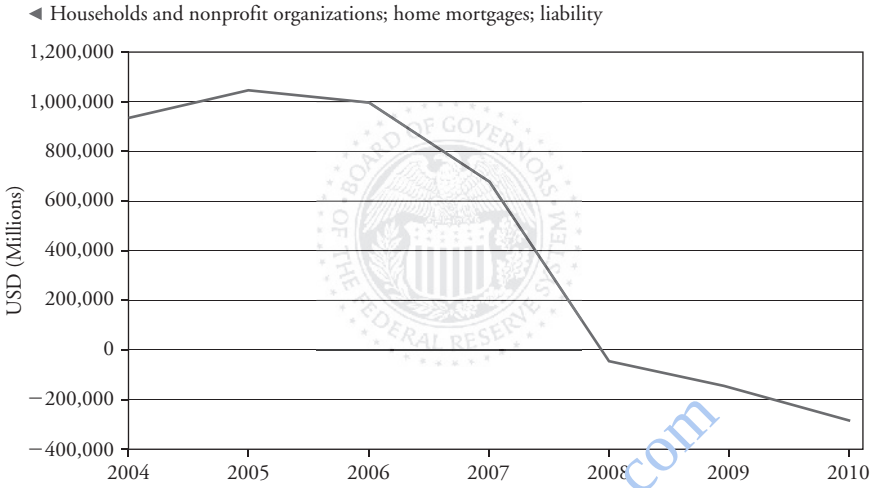


EXHIBIT 1.2 Net Flow of New Residential Mortgage Credit
Source: Federal Reserve Board, 2011.

securitization markets. Mortgages slated for securitization were building up on the balance sheets of lenders.

Originating mortgage pools with the intent of liquidating them through whole loan sales or securitizations net of mortgage servicing is characteristic of the U.S. mortgage market. It is a model that has become ingrained in the housing finance system. It is a model that relies on a deep and liquid secondary mortgage market. Finance companies and banks all over the country scrambled to originate mortgages. The market for these mortgages was certain in the sense that there were bid prices and forward markets, so the risk to the originator was very low, especially since the mortgage pipeline could be hedged. The only risk to a well-managed and honest originator was if there were no offers for the mortgage assets in its pipelines and warehouses.

FROM THE PRIMARY TO THE SECONDARY MORTGAGE MARKET

The primary mortgage market encompasses transactions between mortgagors and mortgagees. This market encompasses the actual extension of credit to households and businesses that are mortgaging property. The secondary mortgage market is where mortgages are refinanced and distributed in the capital and money markets in the form of mortgage-backed

securities. These transactions result in capital flowing back to originators. Investors value the unique cash flows offered by various tranches of MBSs more than they do portfolios of whole loans.

Multifamily and single-family, fixed- and variable-rate, and level-pay and balloon mortgages are all securitized in the agency and private label markets.

The Agency Market

As we write this, there are discussions about dismantling or at least dramatically reforming the two government sponsored enterprises (GSEs) that funnel a majority of the capital from the secondary mortgage market to the primary mortgage market. FNMA and FHLMC make a market in mortgages so that financial institutions can replenish their capital and continue and make new loans. Knowing that there is a market for the mortgages they originate and knowing the prices for these assets both on the spot market and forward markets enables managers to finance long-term assets such as mortgages as short-term inventory. Managers trade illiquid mortgages with the agencies in return for liquid MBSs. FNMA and FHLMC have lost vast sums of private and public capital. The private capital was as a result of losses on the mortgage assets in their portfolios and on assets they guaranteed. The irony is that while FNMA and FHLMC were both deemed "too big to fail" in the midst of the financial crisis, they have become even bigger since the nonagency segment of the MBS market collapsed. Credit for everyone very nearly turned into credit for no one.

The agencies will not disappear until there is an entity or more likely entities that will fill the role of providing liquidity to the secondary mortgage market across the economic cycles. We will not speculate on the final outcome of the two mortgage GSEs, but we are confident that securitization will continue to play a major role in the financial markets. Without securitization, bank balance sheets will become too heavy in a growing economy and this would dampen the economy.

Mortgage-backed securities issued by FNMA and Freddie Mac or guaranteed by GNMA are at the core of the secondary market for conforming mortgage loans. GNMA is a wholly owned corporate instrument of the United States within the Department of Housing and Urban Development. GNMA guarantees the full and timely payment of principal and interest on MBSs. The quality of the guarantee is that of "the full faith and credit of the United States."

A mortgage lender qualified to do business with GNMA originates a pool of mortgages and submits the mortgages to GNMA to create guaranteed MBSs. An institution acting as central paying and transfer agent

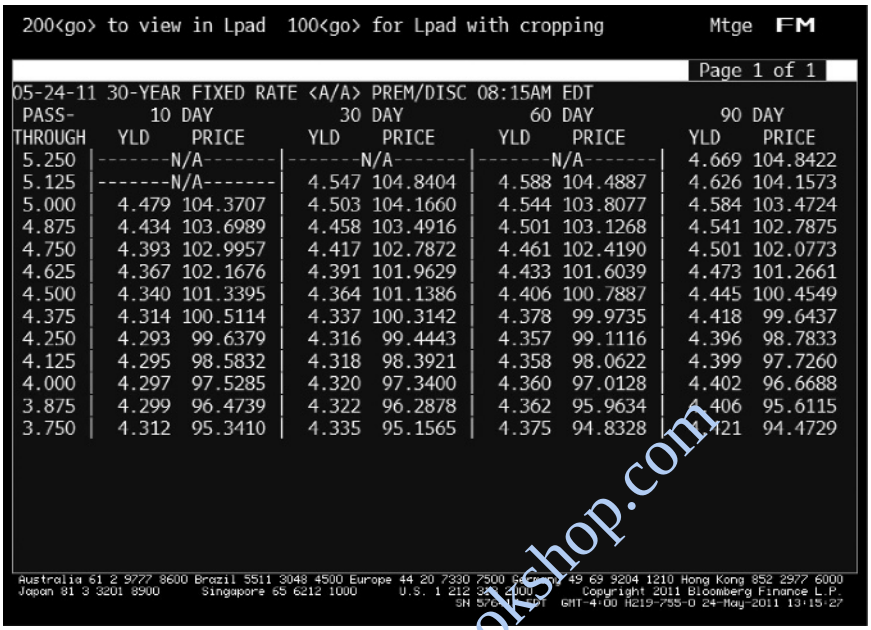
registers the securities secured by a mortgage pool with a clearing agency registered with the Securities and Exchange Commission (the depository), which issues the MBSs through the book entry system. GNMA-guaranteed MBSs are backed by mortgages that are guaranteed by the following U.S. government agencies: the Federal Housing Administration (FHA), the Department of Agriculture's department of Rural Housing Service (RHS), the Department of Veterans Affairs (VA), and the Office of Public and Indian Housing (PIH).

As was noted earlier, FNMA and Freddie Mac are GSEs, chartered by the United States Congress. The equity of FNMA and Freddie Mac is owned by private investors. Shares of FNMA and Freddie Mac are listed on the New York Stock Exchange. Their congressional charters define their mission, which is to lower the cost of mortgage capital to low-, moderate-, and middle-income Americans by creating and sustaining a deep, liquid, and stable secondary mortgage market. They accomplish their mission by providing mortgage originators with an efficient way of liquidating their mortgage portfolios. Since the first edition of this book, both FNMA and FHLMC have been placed under the conservatorship of the U.S. government.

FNMA and Freddie Mac are able to offer continuous bid prices for mortgages at favorable rates because the market for agency MBSs and agency debt are efficiently priced. The market for agency-guaranteed MBSs is standard, deep, and liquid. In 2002 $721.2 billion of single-family residential mortgages were originated. In 2002, $328.1 billion of federally related mortgage pools were securitized, and $100.4 billion of private mortgage pools were securitized. The principal value of federally related mortgage pools outstanding at the end of the second quarter of 2002 was $3.04 trillion (approximately $2.995 trillion single-family residential mortgages and $86.1 billion multifamily mortgages). Debt of the U.S. federal government financed with Treasury securities at the same time was $3.42 trillion. Total household mortgage debt was $6.05 trillion.[3]

Exhibit 1.3 illustrates the prices offered by FNMA (bid) and the corresponding yields on May 24, 2011 at 8:15 A.M. EST, for 30-year fixed-rate mortgages for an array of coupons. The prices are quoted for delivery in 10, 30, 60, and 90 days. Notice that bids are discount and premium. Premium bids are for higher pass-through rates and discount bids for lower. The trade-off is not linear because the prepayment option is deeper in the money for the higher pass-through rates. The mortgages sold for cash to FNMA and FHLMC will either be held by these institutions or securitized.

FNMA and Freddie Mac buy qualifying fixed- and variable-rate mortgages on the spot and forward markets net of servicing contracts from originators. The servicer is responsible for regularly collecting the mortgagors' payments.



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Page 1 of 1

05-24-11 30-YEAR FIXED RATE <A/A> PREM/DISC 08:15AM EDT

PASS-THROUGH	10 DAY YLD	10 DAY PRICE	30 DAY YLD	30 DAY PRICE	60 DAY YLD	60 DAY PRICE	90 DAY YLD	90 DAY PRICE
5.250	-------N/A-------		-------N/A-------		-------N/A-------		4.669	104.8422
5.125	-------N/A-------		4.547	104.8404	4.588	104.4887	4.626	104.1573
5.000	4.479	104.3707	4.503	104.1660	4.544	103.8077	4.584	103.4724
4.875	4.434	103.6989	4.458	103.4916	4.501	103.1268	4.541	102.7875
4.750	4.393	102.9957	4.417	102.7872	4.461	102.4190	4.501	102.0773
4.625	4.367	102.1676	4.391	101.9629	4.433	101.6039	4.473	101.2661
4.500	4.340	101.3395	4.364	101.1386	4.406	100.7887	4.445	100.4549
4.375	4.314	100.5114	4.337	100.3142	4.378	99.9735	4.418	99.6437
4.250	4.293	99.6379	4.316	99.4443	4.357	99.1116	4.396	98.7833
4.125	4.295	98.5832	4.318	98.3921	4.358	98.0622	4.399	97.7260
4.000	4.297	97.5285	4.320	97.3400	4.360	97.0128	4.402	96.6688
3.875	4.299	96.4739	4.322	96.2878	4.362	95.9634	4.406	95.6115
3.750	4.312	95.3410	4.335	95.1565	4.375	94.8328	4.421	94.4729

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2011 Bloomberg Finance L.P.
SN 576 [illegible] GMT-4:00 H219-755-0 24-May-2011 13:15:27

EXHIBIT 1.3 Forward Price/Yield Matrix for FNMA Pass-Throughs across an Array of Pass-Through Rates
Source: Bloomberg.

The servicer also collects payments on delinquent accounts, manages foreclosures if necessary, with the goal of obtaining the maximum value. The servicer, typically the originator, retains a servicing fee (around 25 basis points, or bps), which is a percentage of the outstanding balance in the previous period.

FNMA and Freddie Mac also exchange MBSs in the form of pass-through certificates and participation certificates (PCs), respectively, for pools of mortgages owned by financial institutions. The two organizations guarantee the timely payment of interest and principal on the MBSs they issue. MBSs that benefit from either the FNMA or Freddie Mac guarantee are not explicitly rated but trade like AAA or better credits.

The financial guarantees issued by FNMA and Freddie Mac are those of private companies and are primarily supported by, and traded on, the robustness of their financial strength. When the first edition of this book was published in 2005, the senior unsecured debt of FNMA was rated AAA, and it had short-term ratings of A-1+/P-1. The capital adequacy of FNMA and Freddie Mac is regulated and monitored by the Federal Housing Finance Agency (FHFA, the SEC, HUD, and Treasury). FHFA was created

in 2008 with the passage of the Housing and Economic Recovery Act. The previous regulator of the GSEs, the Office of Federal Housing Enterprise Oversight (OFHEO), was wrapped into the FHFA, within the department of Housing and Urban Development. Embedded in the overall strength of the FNMA and Freddie Mac MBS guarantees was their special status as GSEs with a public mission and their large asset bases and flows of funds. The capital of the GSEs proved to be entirely inadequate relative to the risks that were guaranteed and those that were booked. We will not go into the reasons why management invested in risks that they would not themselves guaranty or why the guaranty fees charged were not adequate to cover losses on MBSs once the prime mortgage market began experiencing historically high default rates (see Exhibit 1.4), but the once-fluid market for agency MBSs and debt began to seize up in the autumn of 2008 and this was a too-big-to-contemplate failure: *way* too big.

Exhibit 1.4 illustrates how in 2008 default rates on prime mortgages, the mortgages that FNMA and FHLMC guaranteed, climbed rapidly to reach 6.32 percent per year of outstanding loan balance. This does not represent actual losses to FNMA because funds are recovered in foreclosure

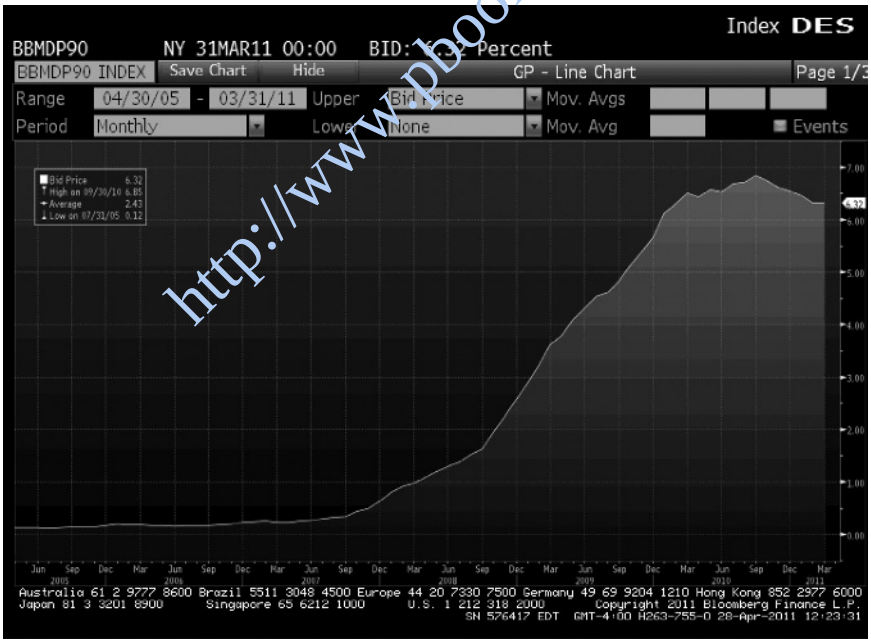

EXHIBIT 1.4 Annual Default Rates on Prime Mortgages
Source: Bloomberg.

on properties. It must be noted that defaults rates were increasing in a rapidly contracting property market. Even if a significant portion of funds were to be recovered, the defaults place a strain on the liquidity of the guarantor, in this case the GSEs. When creditors began to doubt the quality of the trillions of dollars of MBSs or the direct obligations of FHLMC and FNMA, the foundations of the mortgage market of the United States and thus the global financial system was threatened.

Residential real estate prices were falling, contradicting the single most important assumption that had been accepted as gospel, and that would cover all sloppiness at every juncture from origination to securitization: that is, that real estate prices would not decline and would continue their double-digit rate of appreciation.

While believing that housing prices would simply continue their upward trajectory seems utter nonsense in hindsight: "bubble thinking" is an essential ingredient to the formation of financial bubbles. The dot-com bubble was based on belief in the "new economy," in which "cool" ideas trumped cash flows from operations.

Exhibit 1.5 illustrates that the distress of FNMA by August of 2008 had pushed the cost of insuring FNMA debt, the price of buying a credit default

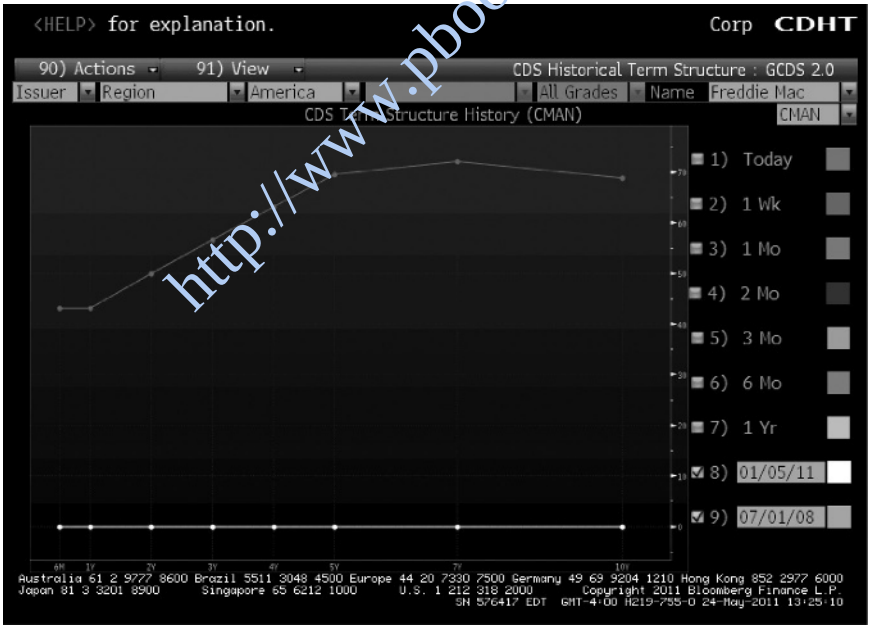

EXHIBIT 1.5 Credit Default Swap Rates on FNMA Debt
Source: Bloomberg.

swap, into the 70 bp range for maturities out to seven years. While this pales in comparison to the credit default swap (CDS) rates on Lehman Brothers during its final months, the cost was not insignificant.

Value of the CDS on FNMA and FHLMC in the summer of 2008 indicated that the market was pricing in the territory of "too big to fail," while insolvency was evident. Understanding that the implications of a GSE failure would be catastrophic, investors for the most part were counting on a very high probability that the Federal Government would arrange some sort of scheme that would save creditors. The scheme was conservatorship.

Conservatorship of the GSEs for all practical purposes was a blanket guarantee of the current and future obligations of the two GSEs. This is reflected in the cost of the CDS. Conservatorship drove the price to zero.

Prior to the placement of both FNMA and FHLMC into the conservatorship of the U.S. government, the U.S. Treasury, at the discretion of the Secretary of the Treasury, had the option of buying up to $2.25 billion of FNMA obligations at any one time. While this option has not been exercised, its very existence would increase the liquidity of the GSEs and link the GSEs to the U.S. government in a way that investors perceived as an implicit government guarantee. If there ever were a case for the characterization "too big to fail," Freddie Mac and FNMA both qualified.

Conservatorship bound the U.S. government even more tightly to the two GSEs, making government responsible for corporate governance. The public policy question becomes: how open-ended is the capital obligation of the U.S. Treasury to FNMA and FHLMC? Exhibit 1.6 illustrates that between 2001 and 2006 there was a decline in the percent of residential mortgages funded via GSE agency securitization trusts or directly on their balance sheets and then this percent began to increase again to reach a maximum of 57.59 percent in 2010.

It is worthwhile to examine the before-crisis and after-crisis business description by FNMA management as presented in their 10-K. In fiscal year 2009, FNMA announces:

> *Although we are a corporation chartered by the U.S. Congress, our conservator is a U.S. government agency, Treasury owns our senior preferred stock and a warrant to purchase 79.9% of our common stock, and Treasury has made a commitment under a senior preferred stock purchase agreement to provide us with funds under specified conditions to maintain a positive net worth, the U.S. government does not guarantee our securities or other obligations. Our common stock is listed on the New York Stock Exchange ("NYSE") and traded under the symbol "FNM." Our debt securities are actively traded in the over-the-counter market.*

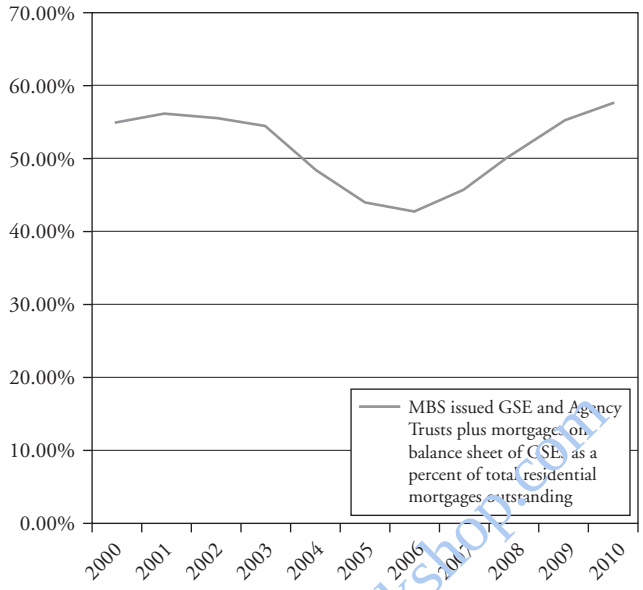

EXHIBIT 1.6 MBSs Issued: GSE and Agency Trusts plus Mortgages on Balance Sheet of GSEs as a Percent of Total Residential Mortgages Outstanding
Source: U.S. Flow of Funds, Board of Governors of the Federal Reserve.

In fiscal year 2006, it states:

> *Although we are a corporation chartered by the U.S. Congress, the U.S. government does not guarantee, directly or indirectly, our securities or other obligations. We are a stockholder-owned corporation, and our business is self-sustaining and funded exclusively with private capital. Our common stock is listed on the New York Stock Exchange ("NYSE"), and traded under the symbol "FNM." Our debt securities are actively traded in the over-the-counter market.*

Between 2006 and 2009 the mortgage markets in the United States changed dramatically. Private markets failed and the public stepped in to keep the economy functioning. The U.S. government as conservator embedded itself directly into the capital structures of FNMA and FHLMC. While not a direct guarantee of GSE obligations, there is a commitment to keep the GSEs solvent, which amounts to the same thing.

The raison d'être of the GSEs is summarized in the following excerpt from the 10-K for the fiscal year 2010. It is the ability of FHLMC and FNMA to fund themselves at preferential rates across economic cycles and pass part of these savings onto to households that is the justification for the existence of the GSEs. The private sector or nonagency market began to push up against GSE territory by lowering underwriting standards and offering loans that would not qualify as collateral in GSE MBSs. If the private sector was willing to serve a different market segment than FNMA and FHLMC, this may have been a good outcome. The problem was that the GSEs stepped over the boundary to defend market share and began to buy and guarantee mortgages that increased the risks they were funding relative to capital. When the housing market collapsed and default rates accelerated, the GSEs became stressed to the point of insolvency.

Borrowers typically pay a lower interest rate on loans acquired or guaranteed by Freddie Mac, Fannie Mae, or Ginnie Mae. Mortgage originators are generally able to offer homebuyers lower mortgage rates on conforming loan products, including ours, in part because of the value investors place on GSE-guaranteed mortgage-related securities. Prior to 2007, mortgage markets were less volatile, home values were stable or rising, and there were many sources of mortgage funds. We estimate that prior to 2007 the average effective interest rates on conforming single-family mortgage loans were about 30 basis points lower than on nonconforming loans. Since 2007, there have been fewer sources of mortgage funds, and we estimate that interest rates on conforming loans, excluding conforming jumbo loans, have been lower than those on nonconforming loans by as much as 184 basis points. In December 2010, we estimate that borrowers were paying an average of 68 basis points less on these conforming loans than on nonconforming loans. These estimates are based on data provided by HSH Associates, a third-party provider of mortgage market data.

Federal Home Loan Mortgage Corp,
10-K for the fiscal year 2010

FHLMC management is making the point that as the sources of funds willing to buy private label flooded the MBS market prior to 2007, yields on these securities fell, but when investors fled this market yields rose relative to the agency market. This is what we would expect. This is the public policy problem: how to reform the GSEs so that private capital supports the secondary mortgage market without exposing the market

to liquidity crises during stressful economic periods. Perhaps a government reinsurance fund that absorbs losses after the private market composed of many not-too-big-to-fail mortgage conduits will be part of the final solution.

GSE's MBS

In the United States, mortgage-backed securities (MBSs), created by securitizing mortgages, form the core of the secondary mortgage market. This market channels capital from the national and international capital and money markets to the households who must issue mortgage debt to finance and refinance their homes. Securitization, the process of pooling loans and converting them into securities, integrates the retail lending market with the wholesale securities markets. Securitization creates relatively liquid securities from relatively illiquid financial instruments, mortgages, consumer loans, automobile loans, leases, dealer floor plan loans, commercial mortgages, home equity loans, and home equity lines of credit, just to mention the most securitized assets classes.

The most common securitization transaction is when a financial institution trades a pool of mortgages with either FNMA or Freddie Mac for a security backed by the same pool of mortgages. The resulting mortgage-backed securities are pass-through securities. A pass-through security is a composite of the individual mortgages backing the security. Investors buy securities issued by a trust that represents a beneficial interest in the asset pool. These securities give the owners a right to the cash that flows into the pool from the amortizing mortgage loans and interest paid on this principal. The mortgages typically are serviced by the originator of the loans. Part of the servicing function is to advance funds to the trust, collect and distribute payments, and if necessary coordinate foreclosures. Cash flows composed of monthly interest and principal payments made by the mortgagor are collected by the servicer and passed through via a paying agent to the owners of the MBSs. Investors buy undivided beneficial interests in the pool of mortgages that have been securitized. Since the mortgage-backed security is significantly more liquid than the pool of mortgages, it can be funded at a lower rate than the mortgages. The enhanced liquidity of the MBS appeals to a broader and deeper pool of investors than the unsecuritized mortgages, referred to as whole loans. The liquidity of the MBS appeals to financial institutions because the management of liquid assets is less costly and regulatory capital treatment of MBSs is preferential to the treatment afforded to whole loans.

Next is an excerpt from a FNMA Prospectus Supplement. It illustrates how the fundamental building block of the MBS market, a mortgage

pass-through security, is created. Since the market for agency MBSs is liquid and secure, it offers a benchmark off which nonagency MBSs can be priced.

FANNIE MAE MORTGAGE-BACKED SECURITIES PROGRAM
SUPPLEMENT TO PROSPECTUS DATED JUNE 01, 2009

$15,582,033.00

ISSUE DATE JANUARY 01, 2011

SECURITY DESCRIPTION FNMS 04.0000 CL-941608

4.0000 PERCENT PASS-THROUGH RATE

FANNIE MAE POOL NUMBER CL-941608

CUSIP 31413CR50

PRINCIPAL AND INTEREST PAYABLE ON THE 25TH OF
EACH MONTH BEGINNING FEBRUARY 25, 2011

POOL STATISTICS:

SELLER ASTORIA FEDERAL SAVINGS AND LOAN ASSOCIATION

SERVICER ASTORIA FEDERAL SAVINGS AND LOAN ASSOCIATION

NUMBER OF MORTGAGE LOANS 58

AVERAGE LOAN SIZE $268,675.96

MATURITY DATE 01/01/2041

WEIGHTED AVERAGE COUPON RATE 4.3440%

WEIGHTED AVERAGE LOAN AGE 0 months

WEIGHTED AVERAGE LOAN TERM 351 months

WEIGHTED AVERAGE REMAINING MATURITY 351 months

WEIGHTED AVERAGE LTV 61%

WEIGHTED AVERAGE CLTV 62%

WEIGHTED AVERAGE CREDIT SCORE 763

% UPB WITHOUT CREDIT SCORE 0.00%

% UPB WITH INTEREST ONLY FIRST DISTRIBUTION 0.00%

% UPB WITH THIRD PARTY ORIGINATION 0.00%

Fifty-eight mortgage loans originated by Astoria Federal Savings and Loan Association were sold to FNMA. FNMA transferred these mortgages to a trust that then issued mortgage-backed pass-through securities backed by the pool of 58 mortgages. The pool was given a number and a prefix. In this case, the pool number is CL-941608. The CL prefix is for pools of conventional long-term, level-payment mortgages; single family; maturing

or due in 30 years or less. CN is the prefix for pools of conventional short-term, level-payment mortgages; single-family; maturing or due in 10 years or less. The complete list of pool prefixes can be found on the Fannie Mae website (www.fanniemae.com).

In this example, the trust sponsored by FNMA finances this pool of mortgages by issuing the security FNMS 04.0000 CL-941608. The CUSIP for the security is 31413CR50. Astoria may decide to hold the MBSs or sell it in the secondary market. In fact this pass-through security ended up as collateral for a $6 billion FNMA mega MBSs, which is a pass-through security backed by mortgage-backed FNMA pass-through securities, as opposed to backed by whole loans. While MBSs are more liquid than whole loans, securities backed by a portfolio of MBSs should be more liquid than the individual MBS. We qualify this statement because it is important to compare similar tranches. A senior class rated AAA with an X year weighted average life (WAL) and a Y year duration backed by a pool of FNMA MBSs should be more liquid than a single MBS with the same characteristics.

Liquidity trades at a premium and the process of securitization has been successful in creating liquid securities out of illiquid financial instruments. In the aftermath of the crisis in the securitization markets, we have also learned that complexity and finer distillation of risk soaks up liquidity. While the leveraged tranches of securitization series may be small relative to the senior, more highly rated tranches, it is only the placement of the riskier classes that makes the transaction possible. The creation of highly leveraged classes backed by levered mortgages such as interest-only loans and loans with a negative amortization option was only possible in an environment of rapidly increasing real estate values. The very illiquid nature of the bottom portion of securitization series destabilized the market for ABS and real estate. When expectations about home prices and default rates were reversed, banks needed capital to support losses rather than to make new loans and investments. As the economic balance shifted to financing losses rather than future prospects, an economic contraction was set in motion.

It is important to note that the pass-through rate of 4 percent is lower than the weighted average coupon of the mortgage pool. This difference is explained by the guarantee fee that FNMA charges and the servicing fee paid to Astoria for its role as servicer. The prospectus supplement also includes loan level data in terms of ranges and medians. For example pool statistics showing the median LTV, credit score, and principal value is given. Geographic distribution of the pool is given, as is the purpose of the loan, whether it is issued to refinance an existing loan or for the initial home purchase. GSE MBSs have traded somewhere between AAA rated and U.S. government guaranteed. Essentially the problem for investors was forecasting the rate of loan prepayment across different interest rate and credit scenarios. GSE guarantees of timely payment of interest and principal on the

MBS they have arranged transformed credit problems into timing problems. This is because a default on a mortgage in a pool securitized by one of the GSEs is treated like a prepayment of principal, and the trust is compensated by FNMA or Freddie Mac for accrued interest and outstanding principal. When an MBS is purchased at a discount, then faster prepayments due to falling interest rates on mortgages boost yields from capital gains but diminish yield due to the reinvestment of interest and principal at lower prevailing market rates. When an investor buys an MBS at a premium, then faster repayments due to falling interest rates diminish yield as the mortgages repay at par and the premium price is not offset by the higher interest rate for the expected length of time.

Once Astoria has traded its mortgages for FNMA or Freddie Mac pass-through securities, managers have liquid securities to deal with. They may decide to sell all or a portion of the securities either over time or immediately, depending on market conditions and their institution's need for capital to deploy or reserve. If the MBSs are sold, they may end up as part of the assets in a collateralized mortgage obligation structured by an investment bank or remain as MBSs and become the assets of another bank or investment fund. Securitization links the retail lending market with the wholesale funding market, and this becomes evident when we realize that the mortgages originated and serviced by Astoria Federal Savings and the multitude of other lenders are transformed into securities that appeal to investors all over the world. Bear Stearns, Merrill Lynch, and Lehman Brothers were active players in this market. Commercial banks and investment banks were using the process of securitization to generate fees and trading profits. As long as the future would, within a reasonable certain confidence interval, replicate the past, then financial engineers were able to create and salespeople were able to sell leveraged illiquid MBSs and ABSs. The problem, as we now know, was that the future in terms of real estate prices did not resemble the past, and ratings agency models collapsed and shabby underwriting practices were laid bare.

FNMA has three primary business segments: single-family credit guaranty, housing and community development, and capital markets. It is the responsibility of the managers of the single-family credit guarantee segment to swap FNMA mortgage pass-through securities for pools of fixed and variable-rate mortgages with FNMA-approved sellers. FNMA and Freddie Mac dictate the quality of the mortgages that they are willing to swap for MBSs.

The agencies refer to FNMA, Freddie Mac, and the Government National Mortgage Association (GNMA). GNMA does not securitize mortgages but grants a credit guarantee to securities backed by pools of VA and FHA mortgages that have been securitized by approved lenders. The GNMA guarantee is equivalent to a guarantee of the U.S. government since GNMA is a division of HUD, an agency of the U.S. government. FNMA

and Freddie Mac also guarantee the MBSs that they securitize, but their guarantees are not backed by the full faith and credit of the U.S. government or at least they were not until both GSEs were placed under the conservatorship of the U.S. Government. One element that enabled the managers of FNMA and Freddie Mac to take such excessive risks relative to the capital bases of the institutions they managed was that investors always assumed that the guarantees of FNMA and Freddie Mac would somehow be covered by the U.S. government. In the end, creditors were correct. As the balance sheets of the GSEs grew (see Exhibit 1.7), the institutions became "too big to fail" and, in fact, as the financial crisis worsened and the private label MBS market ground to a halt, FNMA and Freddie Mac became more integral to the U.S. financial system; that is, *much* too big to fail.

Exhibit 1.8 illustrates how securitized mortgage pools have funded an increasing percent of the mortgage stock since the 1970s. This diagram also indicates how the private label market grew relative to the agency market until 2007, when the subprime market collapsed. After 2007 the agency market began to pick up the slack created by the collapse of the private label market. This exhibit shows agency MBS pools relative to the private label pools. The private label market was growing faster, albeit from a much lower starting point, and when it collapsed it was clear that the market share of FNMA and Freddie Mac had to increase, since the private label market disappeared.

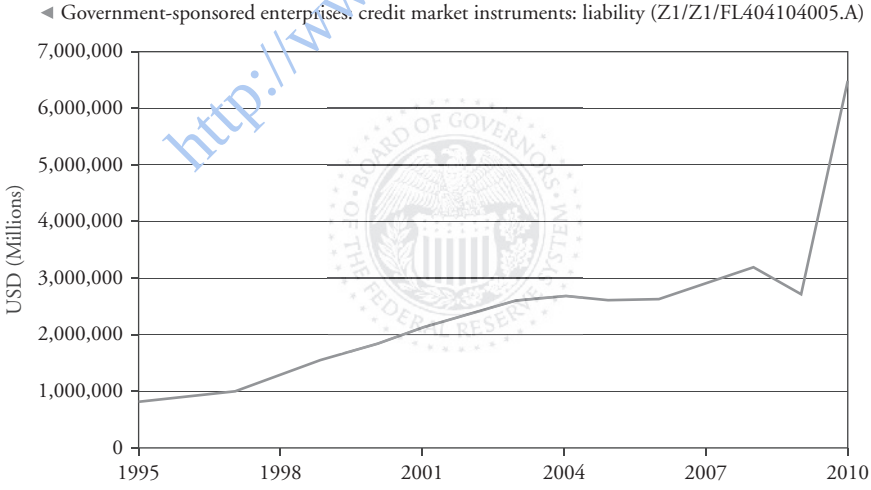

EXHIBIT 1.7 Balance Sheet Liabilities of the Government-Sponsored Enterprises
Source: U.S. Flow of Funds, Board of Governors of the Federal Reserve.

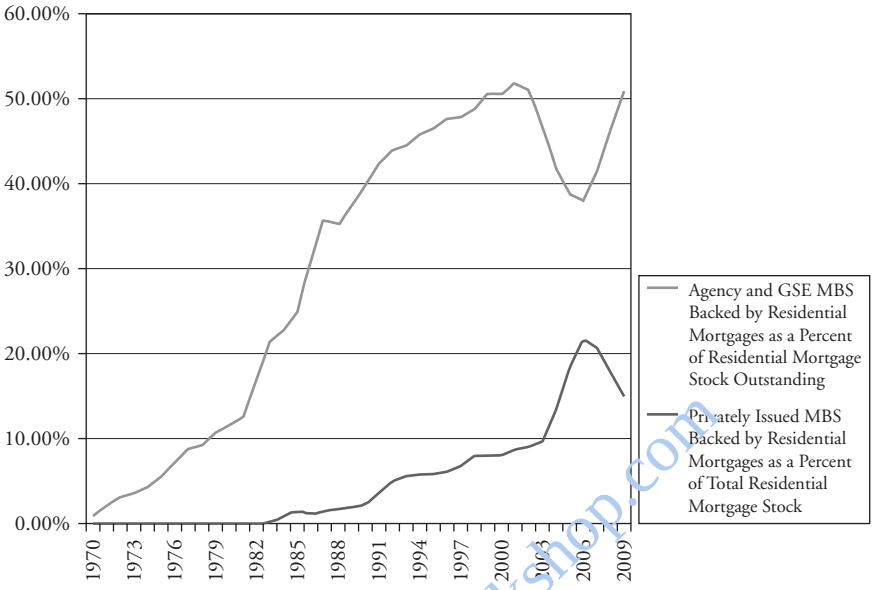

EXHIBIT 1.8 Private Label MBS and Agency and GSE MBS as Percentage of Total Residential Mortgage Assets (1970–2009)
Source: U.S. Flow of Funds, Board of Governors of the Federal Reserve.

In September 2008 the government stepped in to float both FNMA and FHLMC, placing them in conservatorship. While the prospectus supplement of every MBS securitized by the GSEs explicitly states that the securities are not guaranteed by the U.S. government, investors assumed that the federal government via an explicit line of credit with the U.S Treasury, and implicit support flowing from their sheer size and share of the U.S. mortgage market, would support the obligations of the two GSEs, investors were correct.

The Private Label Market

In the private-label market, also called the nonagency or nonconventional market, mortgages are securitized through trusts that generally elect Real Estate Mortgage Investment Conduit (REMIC) status. Credit risk in private-label transactions is financed by subordinate and mezzanine classes of MBSs issued by the REMICs. Tranching credit risk and allocating it disproportionately onto a relatively small amount of principal creates leveraged classes of MBS. These classes with credit ratings reflecting their higher exposure to loss shield the senior classes issued by the trust from credit risk

up to the principal amount of the subordination. Financial institutions may operate in both segments of the MBS markets.

A financial institution (FI) may offer mortgages to FNMA and FHLMC in exchange for pass-through securities or cash or may sponsor a private label securitization. The point is that each refinery route, agency or private, gets the mortgages off the originating FI's balance sheet or off the balance sheet of an FI that is buying and warehousing the mortgages. Qualitative differences between the raw material (mortgages) refined by each segment of the MBS market are in terms of the size, credit quality, and underwriting standards. Flows of lower quality (higher risk) mortgages and mortgages that exceeded the FNMA and FHLMC limits (jumbo loans) went to private label securitization transactions. Real Estate Investment Trusts (REITS) such as American Home Mortgage were among the first institutions to be shut out of the money and capital markets and collapse in 2007.

So-called conforming mortgage loans are mortgages that conform to the underwriting standards and structural criteria of FNMA, Freddie Mac, and GNMA. A mortgage exceeding the FNMA or Freddie Mac limit on size or loan-to-value ratio, on the other hand, is nonconforming. On January 1, 2002, the maximum loan size for a mortgage on a single-family residence was increased from $275,000 to $300,700.

Loans that are nonconforming were not to be used as collateral for an agency MBS, nor would FNMA or Freddie Mac buy nonconforming loans on a cash basis. In other words, the loans that the GSEs buy and swap for MBSs must adhere to the constraints set forth in the selling guide. The characteristics of "conforming" were either too broad or ignored, so that enough weak credits came to rest on the balance sheets of the GSEs placing both institutions at risk. The special status of FNMA and Freddie as GSEs owned by private investors (both are listed on the NYSE) placed the profit motive next to the public policy motive. Of course, subprime and Alt-A mortgages did not conform to the GSE underwriting standards that should have protected the balance sheets of the GSEs to a great extent from the subprime crisis. Subprime risk found its way onto the balance sheets of the GSEs as portfolio managers of FNMA and Freddie loaded up on subprime and Alt-A MBSs. They invested in what they would not guarantee!

In all fairness these managers were making an attempt to fulfill the GSE mission of making housing more affordable for low-income Americans. Loans to subprime mortgagors and mortgages underwritten according to looser Alt-A standards did make housing more available to those who had been priced out of the market due to poor credit and/or low income and net worth, but the credit risk was badly mispriced. The contraction of the economy eventually led to very high rates of default on conventional (prime) mortgages, and this strained the capital of the GSEs as losses mounted.

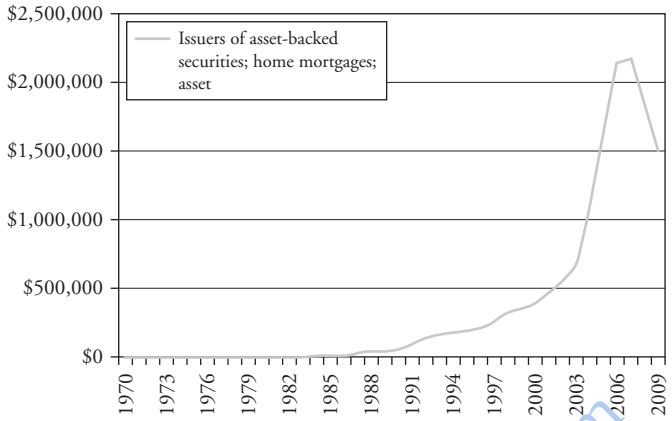

EXHIBIT 1.9 New Issues of Private Label Asset-Backed Securities, Home Mortgages, Assets (in millions of dollars)
Source: U.S. Flow of Funds, Board of Governors of the Federal Reserve.

Losses on the subprime investments owned by the GSEs plus their credit guarantees on approximately $455 billion worth of MBS (as of end-of-year 2008, this number included GNMA MBSs that were guaranteed by HUD, which is not a GSE but rather an agency of the U.S. government) that were also experiencing very high levels of default eroded the thin capital bases of FNMA and FHLMC. By the summer of 2008 investors in the credit obligations of the agencies and GSE-guaranteed MBSs had become fearful.

Exhibit 1.9 indicates the growing demand for private label MBSs. The data are from the U.S. Flow of Funds Accounts at the website of the Board of Governors of the Federal Reserve.

The market for mortgage-backed securities has been divided along the agency/nonagency line. Another term for nonagency is *private label*. Within the private label market, the subprime and Alt-A segments were the sources of extreme credit problems that ultimately crashed the financial system.

The following excerpt from the 2010 10-K of PNC Financial Services Group clarifies this distinction. It is important to remember that not the entire private label market for MBSs is subprime or Alt-A, but these segments grew as a share of the private label market.

> *At December 31, 2010, our residential mortgage-backed securities portfolio was composed of $31.7 billion fair value of U.S. government agency-backed securities and $7.2 billion fair value of non agency (private issuer) securities. The agency securities are generally collateralized by 1–4 family, conforming, fixed-rate residential mortgages.*

The non agency securities are also generally collateralized by 1–4 family residential mortgages. The mortgage loans underlying the non agency securities are generally non conforming (i.e., original balances in excess of the amount qualifying for agency securities) and predominately have interest rates that are fixed for a period of time, after which the rate adjusts to a floating rate based upon a contractual spread that is indexed to a market rate (i.e., a "hybrid ARM"), or interest rates that are fixed for the term of the loan. Substantially all of the non agency securities are senior tranches in the securitization structure and at origination had credit protection in the form of credit enhancement, overcollateralization, and/or excess spread accounts.

PNC, 10-K, for the fiscal year ended December 31, 2010

It is very interesting to note that PNC is making a point that they own the senior tranches of private label MBSs. These senior tranches were for the most part originally rated AAA because of the credit enhancement that was issued to absorb losses before the senior tranches or structured into the SPV in the form of overcollateralization or reserve accounts. Generally an SPV uses multiple layers and forms of credit enhancement in a single deal. The analogy is that a financial institution will have different layers of equity types on its balance sheet: common, preferred, convertible preferred, and subordinate debt, to name a few.

While PNC management is stating that "virtually" all of the nonagency MBSs it owns are the senior tranches, it does not say what percentage of these are still AAA. Billions of dollars of nonagency MBSs were downgraded during 2007–2008. The subprime segment of the subprime MBS market was downgraded en masse by the ratings agencies because the underlying collateral was defaulting at rates way outside the upper limits modeled or assumed by the rating agencies. Downgrades not only depressed asset values but also sucked liquidity out of the market at a time when hedge funds and counterparties to subprime-related loan and derivative contracts were being called upon to post more collateral. The margin call that spread the subprime collapse to the money markets and then the capital markets was the June 2007, Merrill Lynch margin call on the two Bear Stearns hedge funds: the Bear Stearns High-Grade Structured Credit Strategies Fund and Bear Stearns High-Grade Structured Credit Strategies Enhanced Leverage Fund. The funds had highly concentrated and leveraged positions in subprime risk via investments in CDOs squared. The ruse of the AAA-rated CDO squared tranches is that the rating did not reflect the instability of the rating. AAA was supposed to be a standard that investors could use as a guide across markets and securities. At the center of the subprime crisis is the fact that not

all AAAs were comparable in terms of credit risk. AAA-rated classes of MBSs backed by a pool of prime mortgages had less credit risk than AAA-rated classes of CDO squared, backed by a portfolio of BBB+-rated classes of subprime MBSs.

This margin call on the Bear Stearns' hedge funds was the shout that the emperor has no clothes. Financial institutions were trying to rid themselves of or hedge their subprime exposure. A disorderly rush for the exits was in the works. Disorderly exits from markets are common threads in financial crises. By this time the shorts had already staked out their positions and were waiting for the shout.

We can look at the downgrades in the ABS/MBS market to get an idea of the number of issues that were downgraded over a very short time frame. There weren't good subprime and bad subprime loans being originated to feed the securitization risk-refining machine after 2005; it was all junk, perhaps different degrees of junk, but nevertheless junk. High credit risk, if priced correctly, does not necessarily pose risk to a single financial institutions or systematic risk to the banking system. When risk is underpriced and, as in the case of the subprime MBS market, the capital of individual institutions is too thin to absorb losses, and if one or more of these too-thinly capitalized banks goes into distress and is "too big to fail," the financial system can quickly become unstable.

Credit risk associated with subprime borrowers was priced for a world without gravity. It was priced during a bubble by people who didn't see the bubble or did not understand that bubbles always pop or thought that they could time the pop and get out at a gain. Highly correlated leveraged junk that would be further leveraged in the securitization of the mortgages as the credit risk of the pool was pushed down onto a relatively small amount of principal. Mortgages and home equity loans buoyed by the rising value of home equity gave comfort to investors and borrowers alike. Many variable-rate mortgages issued by subprime borrowers were designed with low initial interest rates—"teaser rates"—that would reset at the end of the teaser period, which could be from two to five years. Many borrowers assumed they could refinance into a less costly loan just before their loan rate reset, or sell their home. Again, both of these possibilities depended on the continuation of rising home prices. Higher interest rates combined with the depreciation of housing values quickly wiped out significant amounts of home equity. One of the elements that made the subprime market so unstable is that borrowers issued loans that were designed to amortize relatively slowly or, in some cases, negatively; another factor was simply high loan to value ratios.

A massive write-down of asset values on the balance sheets of banks that had exposure to the market began in 2007, ultimately threatening the very solvency of the U.S. banking system by the autumn of 2008. The

downgrades were sudden, broad, and deep. By deep we mean not just a single notch, but multiple notches, and by broad we mean that the downgrades affected the entire subprime market for MBSs, not simply individual securities. On March 30, 2009, 168 classes of Countrywide asset-backed certificates backed by residential mortgages were downgraded by Moody's. This was on a single day! Between April 22, 2009, and May 1, 2009, Moody's downgraded approximately 3,000 classes of MBSs across all issuers. Again, this is a very small time frame and the downgrades that began in 2007 continued well into 2010. There was a consensus that the default rates were going to swamp the credit enhancement that the rating agencies had determined was sufficient to protect the interests of senior investors and offer fair returns to the subordinate investors. The swift realization that subprime risk had been drastically underestimated began to suck capital away from productive growth opportunities. Banks began to run from other banks, as managers were not exactly sure of the extent of subprime exposure for other institutions, not to mention their own.

Subprime-Related Direct Exposures

During the first quarter of 2009, S&B recorded write-downs of $2.296 billion pretax, net of hedges, on its subprime-related direct exposures. The Company's remaining $10.2 billion in U.S. subprime net direct exposure in S&B at March 31, 2009 consisted of (i) approximately $8.5 billion of net exposures to the super senior tranches of CDOs, which are collateralized by asset-backed securities, derivatives on asset-backed securities or both, and (ii) approximately $1.7 billion of subprime-related exposures in its lending and structuring business.

Citigroup 10-K for 2009

While most super senior tranches did not suffer losses in terms of missed cash flows, the underlying credit enhancement was eroded and this increased the risk of the tranche, depressing its price and creating real reported losses for financial institutions that were obligated to mark assets to market.

When a super senior tranche is created, it implies that what would have been a senior tranche is now a subordinated tranche to the super senior. This tranche is called the super senior support. This implies that while both the senior and super senior may be rated AAA, the super senior is less risky. This implies that not all AAA securities can be treated as equal when it comes to credit risk. Super senior classes benefit from the entire credit enhancement built into the transaction (subordination, overcollateralization), and may be additionally enhanced by commitments issued by third parties.

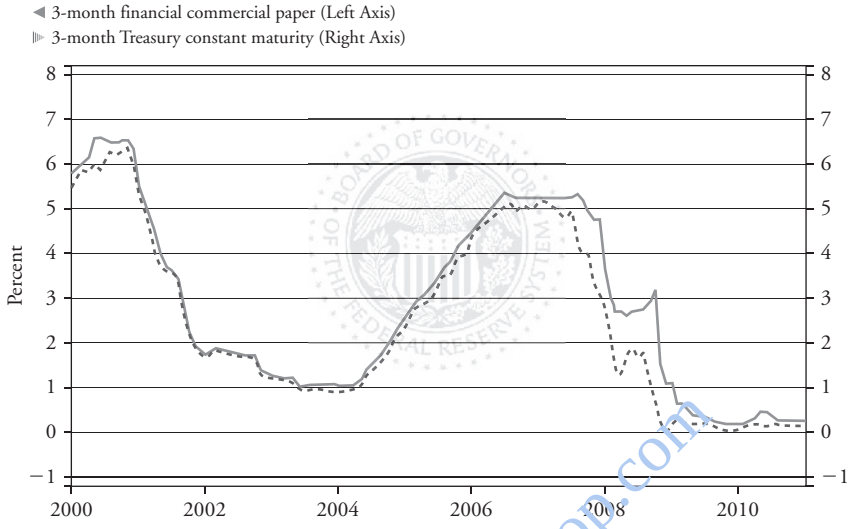

EXHIBIT 1.10 Spread between Three-Month Financial CP and Three-Month Treasury Constant Maturity
Source: Board of Governors of the Federal Reserve.

A look at the spread between the cost of three-month government funds and three-month financial commercial paper from May 2000 to September 2011 illustrates that the spread pre-crisis was quite low, making the cost of borrowing to finance a securitization warehouse only marginally higher than the cost of government funds (Exhibit 1.10). The cost of capital was low and that meant that inventory in the form of mortgages could be cheaply funded before it was securitized. By 2006 the spread began to widen. See Exhibit 1.10.

THE CASE OF COUNTRYWIDE

Financial institutions that relied too heavily on securitization as a source of liquidity were doomed once the market for MBSs and ABSs thinned out as investors turned their backs on any security with the slightest possible exposure to subprime risk. Countrywide's day-to-day operations depended on being able to discount their mortgage originations on the ABCP market and then in the term markets.

> *Changes in investor demand for mortgage loans can have a significant impact on our ability to access the secondary mortgage*

market as a competitive outlet. In the second quarter of 2008, we saw a continuation of the illiquidity in the secondary mortgage market and a continuation of downgrades by certain credit rating agencies of large numbers of mortgage-backed securities. These factors have combined to severely decrease demand for and profitability of a large portion of the products we have historically produced. In response to these developments we have tightened our underwriting and program guidelines and substantially limited our production of non agency-eligible loans to our investment portfolio.

Countrywide Financial Corp. 10-Q for period ending June 30, 2008

A typical securitization structure used to finance pools of prime and subprime mortgages is the CWABS INC ASSET-BACKED CERTIFICATES SERIES 2004-15.[4] The securitization structure is fairly standard across assets with certain features built in to accommodate revolving assets. We discuss dealer floor plan loans, credit-card receivables, and accounts receivables later in the book. It is worthwhile to summarize the CWABS transaction because collateral backing this transaction was the fuel that fed the financial crisis. The credit risk was underestimated and leveraged; a bad combination. By "leveraged," we mean that the credit risk of the entire mortgage pool was shifted to a relatively small principal base.

The summary of this transaction lays out all of the fundamental components of a securitization in general. In Exhibit 1.11 we outline the securitization transaction that Countrywide Financial used to transform a pool of fixed and variable-rate mortgages originated by Countrywide Home Loans into mortgage-backed securities. Following the exhibit we discuss the role of the various parties to the transaction and ratings of the certificates.

The purpose of this transaction is to liquidate a portfolio of mortgages while keeping a potentially profitable interest in the pool. Fees are also earned by the sponsor of the securitization—for example, Countrywide Financial charged for servicing and origination of the mortgages. Cash raised in the securitization transaction is then redeployed by Countrywide Financial, frequently but not necessarily in the origination of new mortgages. This is the foundation of the "originate to securitize" model. Most securitization transactions with some minor variations can be explained by the scheme shown in Exhibit 1.11. The most fundamental differences are not in the blueprints of securitization transactions but rather in the inputs and outputs. Inputs refer to the type and quality of assets and the outputs the cash flows of the ABSs/MBSs issued. The cash flows are distinguished by timing, magnitude, and risk.

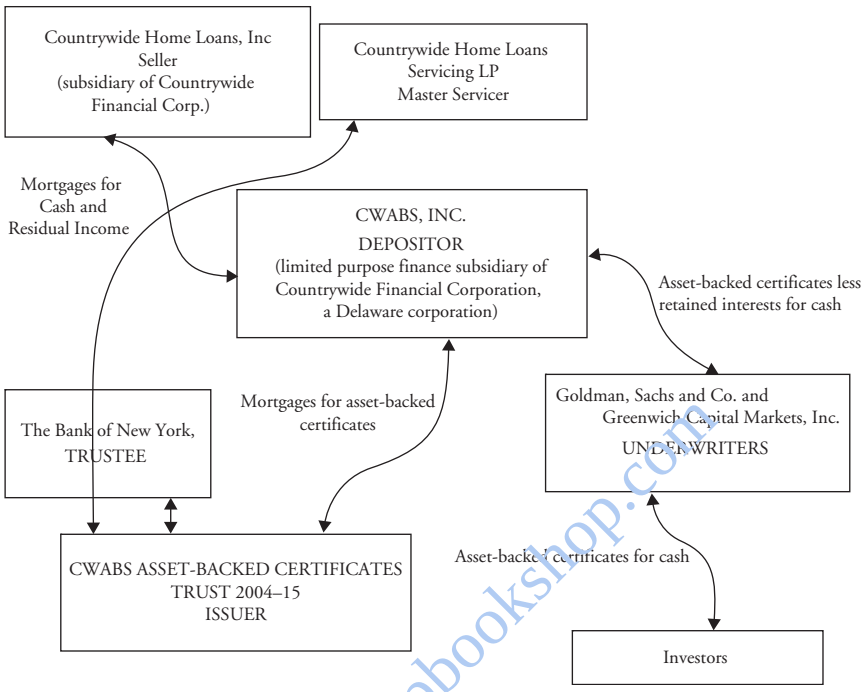

EXHIBIT 1.11 Countrywide Mortgage Securitization Scheme
Source: Data from the SEC's EDGAR database.

The Assets and Parties

The summary of the eight steps of the Countrywide securitization scheme is presented here. The organization of deals tends to repeat over and over with little modification. This standardization is valuable to both the issuer and to the investors and the rating agencies. Once the process is up and running, it may be modified from time to time.

1. **The assets being securitized:** $1.053 billion of fixed and variable-rate "credit blemished" mortgages on one- to four-family residential properties. *Credit blemished* is a term meaning *subprime*, which is a polite way of saying *high yield*, which is a euphemism for junk credit.
2. **The mortgages were originated** by either Countrywide Home Loans or affiliates of Countrywide, or purchased from unaffiliated lenders. Countrywide dictated the underwriting standards of the loans. Dictating

the underwriting standards includes loosening the standards to gain market share.

3. **Countrywide Home Loans** along with affiliates that originated and purchased mortgage loans then take on the role of sellers in the securitization transaction. The sellers transfer in the form of a true sale the mortgage assets to the depositor, according to the terms in the pooling and servicing agreement. The pooling and servicing agreement is a central document in a securitization. It lays out in detail, more detail than is covered in the prospectus supplement, the connection between and responsibilities of the parties in a securitization transaction, and it establishes the trust that will own the assets and issue the MBSs or ABSs. The trust is the special purpose vehicle (SPV) that we refer to throughout this book. The trustee manages the trust for the benefit of the certificate holders.
4. **Countrywide Home Loans Servicing LP** is the master servicer of the securitized mortgage pool. The master servicer is the servicer of the loans in the pool but may rely on one or more subservicers. It should be noted that the use of a subservicer does not in any way dilute the duties and obligations of the master servicer vis-a-vis the securitization trust. Often, as in this transaction, there are multiple originators feeding mortgages to the seller. One of the master servicer's obligations is to advance funds to the SPV so that delays in the receipt of monthly payments of interest and principal do not translate into delays to the investors. Servicers are not obligated to advance funds against mortgage loans that are considered likely to default. As servicer, Countrywide Home Loans collects monthly payments made by borrowers and pursues payments from borrowers who are delinquent.
5. **The Trustee** for this securitization is The Bank of New York. On the closing date the Depositor conveys without recourse for the benefit of the certificate holders of the trust all assets in the trust, which in this case are the mortgage loans and cash generated by interest on an amortization of the mortgages.

   The integrity and experience of the trustee is a lynchpin of a well-functioning transaction. The trustee must make distributions on the 25th day of each calendar month to the certificate holders of record. The trustee manages the distribution account. It is up to the trustee to calculate interest on the adjustable rate and fixed-rate certificates. In this transaction, interest is based on a 360-day year consisting of twelve 30-day months. The trustee must determine according to the prospectus supplement how the principal payments and principal losses are allocated among the certificates and retained interests.

6. **The servicer:** It is worthwhile to take a look at the responsibilities of Countrywide Home Loans Servicing LP because these are the responsibilities of the servicer in general, with of course differences dictated by the asset class. There is no foreclosure associated with credit card receivables, for example. Servicing pools of dealer floor plan loans when the borrowers are sophisticated automobile dealers is less costly and more certain than a pool of subprime mortgages. The cost of servicing increases as mortgagors fall further behind in their payments. While the ex-ante servicing fee will reflect the risk of the mortgage pool, the ex-post servicing fee may prove inadequate if the pool becomes too costly to service due to the high costs associated with delinquencies and foreclosure. It is the servicer's responsibility when beneficial to the owners of the MBSs to alter the terms of the underlying mortgages. Loss mitigation may include one or more of the following actions on the part of the servicer: extending the maturity of the loans, lowering the interest rate, or reducing the principal value. When home prices are rising, servicers will generally not have to engage in loss mitigation because foreclosure will cover the loan balance.

   Servicing is a critically important element in the securitization process. The servicer is the conduit for cash that flows between the borrower and the accounts set up by the trustee for the investors. It is also the servicer who is responsible for advancing funds to the securitization trust and if necessary for organizing property foreclosure. There is a real incentive for financial institutions to grow a leveraged servicing portfolio in lieu of funding financial assets such as home equity loans and mortgages. It is a way for the originator to earn significant fees. Competent servicing is something that rating agencies weight on their analysis.

   The Master Servicer has established standard policies for the servicing and collection of mortgages. Servicing includes, but is not limited to:

   a. Collecting, aggregating, and remitting mortgage loan payments
   b. Accounting for principal and interest
   c. Holding escrow (impound) funds for payment of taxes and insurance
   d. Making inspections as required of the mortgaged properties
   e. Preparation of tax-related information in connection with the mortgage loans
   f. Supervision of delinquent mortgage loans
   g. Loss mitigation efforts

h. Foreclosure proceedings and, if applicable, the disposition of mortgaged properties
i. Generally administering the mortgage loans, for which it receives servicing fees

Billing statements with respect to mortgage loans are mailed monthly by the Master Servicer. The statement details all debits and credits and specifies the payment due. Notice of changes in the applicable loan rate is provided by the Master Servicer to the mortgagor with such statements:

PROSPECTUS SUPPLEMENT, TO PROSPECTUS DATED OCTOBER 25, 2004, CWABS ASSET-BACKED CERTIFICATES TRUST 2001-15

7. The Depositor is CWABS, Inc. CWABS is a Delaware corporation and a limited purpose finance subsidiary of Countrywide Financial Corporation, a Delaware corporation. The depositor buys the mortgage loans from the sellers and then conveys without recourse the mortgages to the trustee that holds the mortgages in trust for the certificate holders. The trust pays the depositor for the pool of mortgage loans with certificates that represent a beneficial interest in the pool. The depositor then places the certificates via underwriters while typically retaining a subordinate interest in the pool.
8. The Issuer of the certificates: is the CWABS ASSET-BACKED CERTIFICATE TRUST 2004-15. 2004-15 refers to the series that is composed of a number of classes of securities, some of which are underwritten and others privately placed or retained by the depositor. If one were interested in finding this security on the Bloomberg system, the ticker is CWL. Within this ticker there are a large number of series that have been issued by individual trusts.

   The residual is being retained by the depositor in this case. The trust must issue a residual class to qualify as a REMIC. Tax rules covering REMICS are complicated and well beyond the scope of this book. Regular interests issued by a REMIC, the mortgage-backed securities, are treated as debt for tax purposes. The residual class of the REMIC has a claim on the residual cash flows of the trust and obligates the owner to pay the taxable income that accrues to the trust. Payments to the owners of the residual class are often but not always subordinate to all regular interest classes. Payments may be made periodically or after all regular interests have been amortized. Losses of the trust are deductible by the owners of the residual. Owners of the residual interest have a claim on the periodic excess

cash of the trust and the value in the trust once all regular interests have been retired.

In this transaction, the trust issues the certificates to the depositor, which in turns sells certain classes to underwriters who will offer them to the public. The depositor in this transaction and most securitization transactions will retain interests in the pool (retained interests), and this is how the profit of the securitization flows back to the sponsor via the depositor, which is a subsidiary.

Bankruptcy Remote

The issuer of the MBS/ABS, is expected to be insulated from all risks other than those embedded in the assets themselves. This means that investors, unlike those who invest in securities issued by a financial institution, should not be exposed to managerial risk or the risk that one part of the institution's business or one segment of its balance sheet begins to lose value. In short, securitization relies on a special-purpose vehicle rather than a general-purpose balance sheet to raise capital. An SPV is not actively managed and the assets it funds are generally homogenous in most dimensions such as obligor type, obligor risk, collateral type, and the underwriting standards used to qualify borrowers.

Let's look at an excerpt from the prospectus supplement that summarizes why investors who buy MBSs and ABSs are not secured lenders or at least have no intention of being treated as secured lenders should the seller in the transaction (Countrywide Home Loans) declare bankruptcy. It is important that the transfer of the loans from the seller to the depositor is considered a true sale for accounting purposes. A secured lender is still tied to the bankruptcy of the borrower and can suffer significant delays and losses in principal and accrued interest if the borrower is reorganized under the bankruptcy code. Investors who buy MBSs or ABSs do not want any credit exposure associated with the investment other than that which is linked to the specific asset pool or asset type that has been securitized. This means that if the originator becomes financially distressed, the investors in the MBSs that are backed by assets originated by the distressed company (in our example mortgages) should in no way be affected. In addition, investors expect that their beneficial interests in the trust are insulated from any risks associated with the depositor, which is a bankruptcy remote subsidiary of the originator. Isolation of the asset pool from all risks other than those embedded in the assets themselves is what enables risky originators to refinance pools of financial assets with AAA-rated MBSs.

> *The seller and the depositor will treat the transfer of the loans held in the trust fund by the seller to the depositor as a sale for accounting purposes. The depositor and the trust fund will treat the transfer of the loans from the depositor to the trust fund as a sale for accounting purposes. If these characterizations are correct, then if the seller were to become bankrupt, the loans would not be part of the seller's bankruptcy estate and would not be available to the seller's creditors. (CWABS Inc., Filed Pursuant Rule 424B [5, Registration File No.: 333-118926, October 25, 2004.] Countrywide Prospectus)*

This is a critical passage. The idea of making the depositor bankruptcy remote from the seller and structuring the transfers as sales for accounting purposes are central to the design of securitization structures. Insulating the assets from the bankruptcy risk of the depositor and seller is what gives investors in the securities issued by the trust the confidence that returns will not be disrupted by financial distress or bankruptcy at the seller or depositor levels. This is critical because investors in the MBSs would suffer losses if the trust assets become tied up in a bankruptcy of either the seller or depositor. The originator sells the assets to a bankruptcy-remote depositor in order to reduce the risk that a court would characterize the transfer as a secured loan by the depositor to the seller.

The pool of assets in this Countrywide deal that we are using as an example were composed of fixed and variable-rate mortgages. The $1 billion worth of mortgage principal was funded with a capital structure that consisted of senior, mezzanine, and subordinate securities. Some of the securities had fixed interest rates and others had floating interest rates. This is a natural hedge for a pool composed of fixed and floating rates assets. It is possible to use interest rate swaps to fund floating rate assets with fixed-rate securities, or vice versa. Once a swap is introduced into the transaction then counterparty risk becomes a factor that investors and rating agencies must consider.

Credit enhancement functions like equity and absorbs losses ahead of more senior classes of securities issued by the securitization vehicle. The legal form of the SPV may be a trust, a limited liability company, or a corporation. The securitization vehicle is a separate entity that owns the financial assets that are securitized. Securitization vehicles have a special purpose, that is, to fund a fixed or revolving pool of assets—thus the term *special purpose vehicle* (SPV). The SPV is generally designed so that it is insulated from the sponsor and originator of the securitization transaction. This is known as

being "bankruptcy remote." This is critical because investors in ABS and MBSs value the assurance that the value of their investment is derived solely from the pool of securitized assets and is insulated from financial distress at the level of the originator or sponsor and is not exposed to future managerial decisions that could dilute or jeopardize returns. Investors who buy ABSs and MBSs do not want to be in the position of a secured creditor to the company that originated the asset. Investors look to the true sale of assets to a subsidiary that is bankruptcy remote from the seller. The bankruptcy-remote subsidiary can then either sell or pledge the assets to the SPV, which will finance the asset pool with ABSs or MBSs. The financial institution uses a bankruptcy subsidiary to invest in residual interests of the SPV to capture value that flows from the securitized asset pool.

If we examine securitization transactions at a very detailed level we will see differences, but the further back we stand in our examination, the more similar the transactions will appear. The common thread is the isolation of a pool of assets from the originator in a vehicle that is extremely constrained in its actions; specifically it is limited to funding the pool of assets and hedging the risks between the liability of the trust and the assets of the trust. There are transactions that will securitize floating rate assets with fixed-rate notes. An interest rate swap entered into by the trust with a third-party financial institution pays the SPV a fixed interest rate in return for a floating rate that is covered by the asset pool's cash flow. Swaps can also be used for currency mismatches between the assets and the liabilities of the SPV. The differences between securitization transactions are more evident on the capital structure side.

A pool of mortgages is sold to a bankruptcy-remote subsidiary and then the asset pool is pledged to an SPV that issues MBSs. The capital structure determines how the cash flows generated by the underlying assets are distributed in terms of time and with respect to the credit, interest rate, and prepayment risk.

Credit Enhancement

Credit enhancement built into the capital structure of an SPV will typically employ various devices. In the example of Countrywide Securitization, the credit enhancement was in the form of overcollateralization and subordination. Overcollateralization is not a fixed amount in this transaction. As excess interest received by the trust is used to amortize the certificates, the overcollateralization amount increases. As the transaction progresses the senior certificates are supported by a larger pool of collateral. In addition to the overcollateralization, the SPV allocates credit risk away from some

tranches onto others. This means that the many layers of subordination protect the senior tranches. The list of classes that was offered to the public is listed below. The pool was composed of both fixed-rate and variable-rate mortgages. The securities issued to fund the mortgages had both floating rates and fixed rates. The prefixes AF, MF, and BF are designations for the senior, mezzanine, and subordinate classes of fixed-rate certificates, respectively. AV, MV, and BV are designations for the variable-rate certificates presented in the order that they must fund losses: (A) senior, (M) mezzanine, and (B) subordinated. Notice that all of the senior certificates were rated AAA, the mezzanine securities had ratings from AA+ down to BBB, and the most subordinate fixed-rate tranche was rated BBB−.

Credit risk was pushed away from the senior tranches that represent approximately 70 percent of the pool balance at origination, while the mezzanine was at approximately 28 percent, and the subordinate balance was roughly 2 percent. This is in addition to the fact that the SPV was overcollateralized. Investors at the time were comfortable with the level of credit enhancement, or at least believed that the credit rating was a good and fair and stable evaluation of the credit risk embedded in the security. Certainly the securities were not stressed for defaults rates in the 30 percent range, or if they were the probability given to this event would have been given such a small weight as to be an insignificant consideration in rating the securities.

The trust issues a residual class in order to qualify as a REMIC. The residual class is an insignificant amount of the mortgage pool. It is used to finance any tax liabilities that the trust may experience and soak up value that may flow into the trust in excess of the trust's obligations, which include payments to regular interests, servicing fees, and fees to the trustee. The REMIC residual has a claim on the excess value floating into the trust and value that remains in the trust after the regular interests have been paid off. What this illustrates is that 70 percent of the pool of risky mortgage loans was financed at yields consistent with AAA ratings and that there were investors willing to absorb first and second losses on the asset pool.

Exhibit 1.12 illustrates the performance of the pool of loans securitized in this Countrywide transaction in terms of 90 or more days delinquent and loans in foreclosure.

The very poor loan performance we observe in this pool of loans is not unique. The result was an erosion of the credit enhancement as the subordinate classes absorbed the losses. Future losses will eat deeper into the subordinate classes. The resulting poor loan performance triggered rating actions by the NSROs (nationally recognized statistical rating organizations). We present a sample of the rating changes for classes in the series CWL 2004-15.

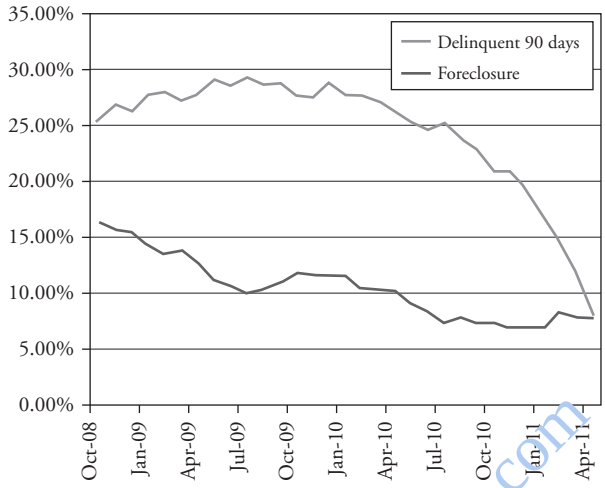

EXHIBIT 1.12 CWL 2004-15 Asset Pool Percent Severely Delinquent and Percent in Foreclosure
Source: Bloomberg.

Another form of distilling and reallocating risk is along the credit dimension. This is not part of the agency market since MBSs issued from agency-sponsored trusts carry the guaranty of either FNMA or FHLMC. GNMA MBSs carry the guarantee of an agency of the U.S. government and trade as such. In the agency market for MBSs the credit risk is funded by the two GSESs—FNMA and FHLMC—who collect a guaranty fee from the flow of interest generated by the mortgage pool. In private label transactions, the capital structure generally is composed of senior, mezzanine, and subordinate classes. Credit risk is shifted onto the subordinate and mezzanine classes.

In the private market, subordination is the typical way of financing the credit risk of the asset pool. For example, a subordinate class would fund 10 percent of the asset pool and be first in line to absorb losses experienced by the underlying assets.

This subordinate class or tranche protects the senior class, which would fund 90 percent of the asset pool. The subordinate class has been leveraged with respect to credit risk. The yield on the subordinate class is highly sensitive to deviations in credit losses from the expected value. Since one class of securities in the SPV's capital structure is leveraged, the other class in our example is protected from losses: It has been deleveraged. Overall risk associated with the underlying assets has not been reduced but only shifted. This capital structure enables the SPV to reduce its funding costs. The lower

yield demanded by investors in the senior tranche more than offsets the higher yield demanded by the subordinate tranches, because the size of the senior tranche is so much larger in principal amount. It is important to keep in mind that, as is the case with any entity that is financing assets, a lower cost of capital is better and translates into higher profit for the institution selling the assets to the securitization structure. This profit is typically captured as a gain on the sale of the assets and/or as a return to a residual interest offered by the SPV and retained by the seller. The source of cash that flows to the residual interest is the cash from the assets that is not needed to pay interest and principal on the securities issued by the SPV. Periodically the residual interest owned by a financial institution is marked up or down depending on cash flow forecasts for the asset pool and the constraints of the SPVs capital structure. Gains and losses due to this marking to market of the residual are sources of profit and losses to the owner of the residual.

An SPV typically funds a pool of mortgages with multiple classes of securities. One or more classes will finance a disproportionate level of the underlying risks and other classes a less-than-proportionate level of risk. The risks are credit, interest rate, prepayment, and possibly currency. The most common ways of reallocating credit risk other than securing a third-party guaranty, which, in the aftermath of the financial crisis, is going to be rather difficult since the companies offering these guarantees are experiencing severe financial distress and do not have the capital or ratings to effectively underwrite new credit risk, are to subordinate one or more classes of securities, overcollateralize the offered securities, and maintain reserve accounts. Overcollateralization simply means to maintain assets in the pool that have more value than the principal amount issued by the trust. There will be a residual created by the overcollateralization of the SPV that will flow back in a measured way to the sponsor/originator if the amounts are not needed to keep the SPV current on its obligations, including those to subordinate creditors.

Subordinating one or more classes of the securities issued by the SPV to enhance the credit quality of other tranches is similar to what a financial institution accomplishes when it issues senior, mezzanine, and subordinate notes. Financial engineers that design the capital structures of SPVs are attempting to find that mix of liabilities that will minimize the cost of capital. Generally the riskier securities in a SPVs capital structure will also be the least liquid.

Other Structures

The overall cost is a weighted average of the yields on all of the securities issued by the trust. The AAA weight of roughly 70 percent dominates this

calculation. Leveraging a multiple of the expected losses of the pool onto the subordinate classes that represented 30 percent of the pool creates leveraged securities. When default rates began to rise from 2007 to 2009 in a real-estate market that was collapsing, subordinate MBSs were downgraded, losing market value as the chances of missed interest and principal payment increased. As losses on the subordinate classes were realized, the probability that the AAA-rated tranches would incur losses increased because they now benefited from less credit enhancement. The AAA securities were written down in value. All of the tranches in a securitization drink from the same pool of assets, so deterioration in the quality of the pool affects all tranches. Not all tranches will be affected equally by losses, because a multiple of expected losses are concentrated on the subordinate and mezzanine tranches, which are a relatively small percent of the pool balance. It is not only credit risk that is reallocated but prepayment risk and interest rate risk, as well. Funneling cash flows generated by the underlying pool of assets as they are received to certain tranches and withholding them for a time from others is what transforms a pool of amortizing assets or short-term revolving assets into securities that various segments of the market demand. The capital structure of an SPV that owns 30-year fixed-rate mortgages may include a very short-term money-market security, a long-term accrual class, and a multitude of other security designs that are protected from prepayment risk, such as planned amortization classes (PACs), and that absorb additional prepayment risk shielding the PAC (support classes). We will examine the various classes that are issued in securitizations later in the book.

> *When we sell loans, we retain credit risk in the form of subordinated mortgage backed securities, including residual and mezzanine securities, and through the representations and warranties made to the issuing trusts for mortgage-backed securities issued by us or purchasers of loans we have sold, through the issuance of corporate guarantees and through the cash-flow prioritization structure of certain securitizations. A significant portion of our portfolio of mortgage-backed securities consists of subordinated securities that absorb all or a disproportionately high percentage of the losses realized on the loans in the related mortgage pool.*
>
> *When we sell loans in the secondary mortgage market, we generally do not sell the MSRs that are created. Depending on the type of securitization, we may also retain other financial interests, including but not limited to, interest-only securities, principal-only securities, and residual securities.*
>
> **Countrywide Financial Corporation, December 31, 2007**

The sponsor's wholly owned bankruptcy-remote subsidiary—the seller in a securitization transaction, will retain some subordinate interests in the pool to extract profit from the transaction and to make the securities issued by the trust more appealing (valuable) to investors. The presence of a residual class in the form of excess servicing will smooth out the rough edges of a risky pool of assets. In addition to excess servicing, other forms of residual interests may be overcollateralization and/or a reserve account. Balances in these accounts earn interest and are expected to be positive when the final class in the series is retired. The residual class of a REMIC, as we state earlier, has a claim on residual cash flows in exchange for funding tax liabilities of the trust. Not all retained interests are residual. The depositors often retain first-loss positions in terms of overcollateralization, and the excess servicing increases the liquidity of the underwritten certificates by making the cash-flow stream expected by investors more certain in terms of timing. In addition, the servicer is obligated to extend short-term credit to the SPV to fill gaps in cash-flow timing.

IRS guidance indicates that a servicing fee in excess of reasonable compensation ("excess servicing") will cause the mortgage loans to be treated under the "stripped bond" rules. Such guidance provides safe harbors for servicing deemed to be reasonable and requires taxpayers to demonstrate that the value of servicing fees in excess of such amounts is not greater than the value of the services provided.[6]

The excerpt from page 37 from the prospectus of the Countrywide transaction illustrates that a key component of securitization income or gain to the originator/sponsor flows via residual and retained interests. Financial engineers, when structuring a series of MBSs, often design one or more interest-only strips (IOs). An IO pays periodic interest on a notional principal balance, which is limited to the outstanding pool balance. The IO may take a senior, mezzanine, subordinate, or residual position in the capital structure of the SPV. Servicing fees are in essence an IO strip. The servicing fee is the equivalent of a coupon and the notional principal is the pool balance. The servicer receives the periodic servicing fee of about 25 basis points divided by the number of periods (12 in the case of pass-through MBSs) and multiplied by the pool balance. One way of capturing the profit of the securitization transaction is to build excess servicing into the transaction. This is a servicing fee above what is considered necessary compensation for the basic servicing responsibilities. It is only servicing in the sense that its form is the same (a percent of outstanding principal each month). It is unlike true servicing because it does not have the priority position in the waterfall of cash distributions from the assets, as does the servicing fee.

When periodic cash flows into the trust are in excess of what is necessary according to the transaction documents (trust indenture, pooling and

servicing agreement, and prospectus supplement) to pay fees, finance charges, and amortize the principal of the regular interests issued by the trusts, this excess or residual is distributed to the owners of residual interests issued by the trust. Since the residual risk is harder to place in the market and demands relatively high yields, it is typically retained by the originator's wholly owned subsidiary, the depositor. The return to the residual is directly linked to the performance of the underlying assets and this performance is tied to rates of prepayment, delinquencies, defaults, and interest. A residual interest may take the form of excess servicing. Excess servicing refers to an interest charge on the outstaying pool balance that is above what is considered compensation to service the pool of loans. The income stream from excess servicing is sensitive to how long the pool balance remains outstanding as well as how large the pool balance is over any period. Unrated subordinate tranches are also residual interests that are frequently retained.

The term residual in the context of a securitization can either refer to a class that is issued by a trust that owns mortgages that has elected REMIC status or more generally to those classes that have a claim on cash flows after the periodic obligations of the trust have been paid.

CERTIFICATE RATINGS

Investors in MBSs do not look to the credit rating of the originator but rather to the rating of the securities themselves. Confidence in these ratings made the MBS and ABS markets liquid and the loss of confidence in the ratings accelerated the demise of the market. It is useful to examine information offered about the certificate ratings in the prospectus supplement for the CWABS INC ASSET-BACKED CERTIFICATES SERIES 2004-15. Exhibit 1.13 shows the ratings for the issued securities at origination and seven years later, in 2011. One of the basic premises of using securitization as a source of capital and liquidity is that the assets securitized can be funded at a lower overall cost than is possible if the assets were to be linked to the credit quality of the originator.

Typically the sponsor will not execute the securitization transaction unless the offered certificates receive a credit rating that is consistent with the expected cost of funding the asset pool. This means that the financial engineers must work with and understand the rating agency analysts and the methodology the rating agencies are employing. The rating constraint for this transaction is set forth in Exhibit 1.13. This is not to say that the rating agency constrains the issuance, but that the sponsor will not securitize the assets unless the minimum rating desired is achieved.

EXHIBIT 1.13 Original Rating CWABS INC. ASSET-BACKED CERTIFICATES SERIES 2004-15 and Rating Seven Years Later

Class	Moody's Rating (at origination, Oct. 2004)	Moody's rating at May 2011
AF1	Aaa	WR
AF2	Aaa	WR
AF3	Aaa	WR
AF4	Aaa	Baa3
AF5	Aaa	Baa3
AF6	Aaa	Baa2
MF1	Aa1	Ba3
MF2	Aa2	Caa3
MF3	Aa3	Ca
MF4	A1	Ca
MF5	A2	Ca
MF6	A3	Ca
MF7	Baa1	Ca
MF8	Baa2	Ca
BF	Baa3	Ca
1AV1	Aaa	Aaa
2AV1	Aaa	WR
2AV2	Aaa	WR
2AV3	Aaa	Aaa
MV1	Aa1	Aa1
MV2	Aa2	A1
MV3	Aa3	Ba1
MV4	A1	B3
MV5	A2	Ca
MV6	A3	Ca
MV7	Baa1	Ca
MV8	Baa2	Ca
BV	Baa3	Ca

Source: CWABS, Inc., Filed Pursuant Rule 424B (5, Registration File No.: 333-118926, October 25, 2004). WR (Withdrawn) indicates tranches are no longer outstanding.

The first and most obvious pattern to notice is that the ratings decline as the position relative to credit losses increases. The BV class is subordinate to the M or mezzanine class, and these are in turn subordinate to the A or senior classes. In this transaction fixed-rate and variable-rate mortgages were segregated and financed separately by the same trust. Within a credit rating the classes issued will have different durations and exposures to principal prepayments.

Exhibit 1.13 illustrates that ratings are not written in stone and investors expect the ratings to be revised if the underlying credit support begins to erode. During the subprime crisis erosion was an understatement and could more accurately be called a landslide, which caused broad downgrades within series and across series of residential MBSs. It wasn't that one deal was bad, rather, the whole market collapsed. All of the bonds in a series are linked since their ultimate performance depends upon the same pool of assets.

The following was released by Standard & Poor's and reported by Reuters on Friday, August 29, 2008: "To date, including the CDO tranches listed below and including actions on both publicly and confidentially rated tranches, we have lowered our rating on 3,556 tranches from 835 U.S. cash flow, hybrid, and synthetic CDO transactions as a result of stress in the U.S. residential mortgage market and credit deterioration of U.S. RMBS. In addition, 1,311 ratings from 441 transactions are currently on CreditWatch negative for the same reasons. In all, we have downgraded $398.51 billion of CDO issuance."[5]

It is interesting to note that tranches of the CWABS 2004-14 series did end up in CDOs that were later downgraded. The tranches of ABS like those in CWABS series were food for the CDOs, indigestion for investors.

Exhibit 1.14 illustrates how one of the tranches of the CWL 2004-15 series was downgraded in 2009. This is only a snapshot of one rating action. There were multiple actions downgrading the classes of CWL 2004-15 during the financial crisis and beyond into 2011.

The across-the-board downgrades of the subprime MBS market were a severe drain on the liquidity of the banking system. It was in the autumn of 2007 when the flow of funds into the secondary market for private-label MBSs became negative. Funds were flowing out of the market, trapping many subprime borrowers who could not refinance or sell their homes. It was in 2008 when the rating agencies decided to come clean and yell "Fire!" This was well after smart money had gotten out or was trying to get out. From this point on the downgrades became more frequent and the private-label MBS market subsequently died.

What was going on at the market level can be easily examined using the Bloomberg system. The system has a very useful function called RATCH <GO>. The user can search for all rating changes in either direction by NSRO and by debt type and within the securitization market by collateral across a chosen time frame. The output of the search can be downloaded into an Excel spreadsheet. (There is a limit of 3,000 results that can be downloaded into a single spreadsheet.) Exhibit 1.15 is a small sample of this type of search. It looks at one of a Countrywide ABS series on a single date.

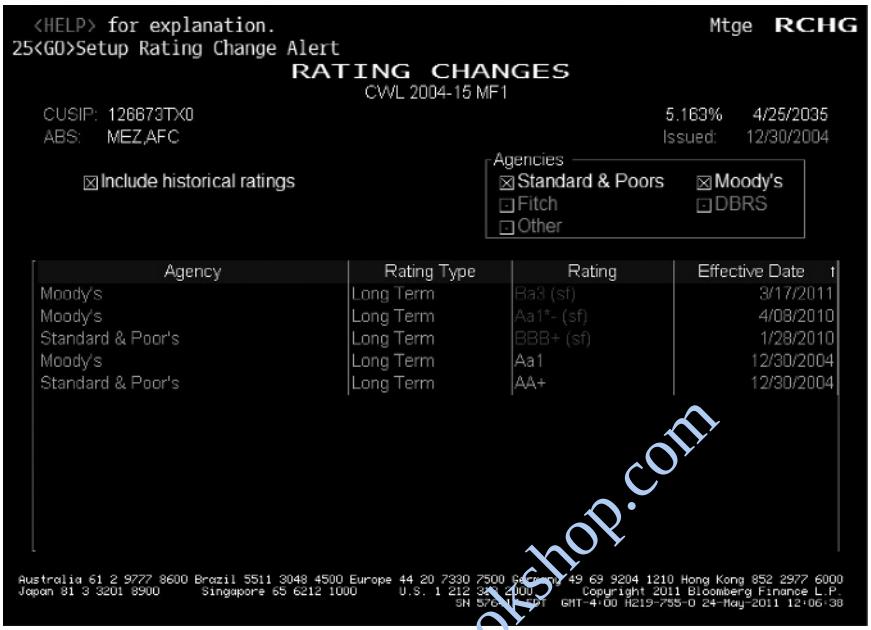

EXHIBIT 1.14 Rating Changes for Tranche 1SMF1 from CWL-2004-15
Source: Bloomberg.

SOURCES OF THE FINANCIAL CRISIS

The causes of the financial crisis can be summarized as follows: There was too much credit extended to too many people at terms that did not reflect the true value of the collateral or true ability of the borrower to repay the loan. Credit was extended under the assumption that the lender always had the exit strategy of foreclosure at a higher price than the value of the principal value of the mortgage. The borrower borrowed under the assumption that he or she had the exit strategy of being able to cash out at a price that exceeded the value of the mortgage. It turns out that both of the exits were built to function if home prices continued their historic ascent, which began in the early part of the twenty-first century.

As home prices accelerated, the terms of mortgages issued by subprime borrowers became less constraining. The bubble mentality had gripped both the buyer and sellers of credit. Too much credit was extended for too little cost to too many households. Both sides of the transaction were acting as

EXHIBIT 1.15 Downgrades of ABS Issued by CWL 2004-15 on April 30, 2009

Ticker	Issuer	Date	Term	Agency	Curr Rating	Curr Watch	Prev Rating	Prev Watch	Country	Currency	Collat Type	Change	Cusip
CWL 2004-15 BV	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Baa3	*-	Baa3		US	USD	RESB/C	-	126673UV2 Mtge
CWL 2004-15 MV8	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Baa2	*-	Baa2		US	USD	RESB/C	-	126673UU4 Mtge
CWL 2004-15 MV7	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Baa1	*-	Baa1		US	USD	RESB/C	-	126673UT7 Mtge
CWL 2004-15 MV6	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	A3	*-	A3		US	USD	RESB/C	-	126673US9 Mtge
CWL 2004-15 MV5	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	A2	*-	A2		US	USD	RESB/C	-	126673UR1 Mtge
CWL 2004-15 BF	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	B3		Baa3		US	USD	RESB/C	-	126673UF7 Mtge
CWL 2004-15 MF8	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Ba2		Baa2		US	USD	RESB/C	-	126673UE0 Mtge
CWL 2004-15 MF7	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Baa3		Baa1		US	USD	RESB/C	-	126673UD2 Mtge
CWL 2004-15 MF6	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Baa2		A3		US	USD	RESB/C	-	126673UC4 Mtge
CWL 2004-15 MF5	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	Baa1		A2		US	USD	RESB/C	-	126673UB6 Mtge
CWL 2004-15 MF4	COUNTRYWIDE ASSET-BACKED	4/30/2009	LT	Moody's	A3		A1		US	USD	RESB/C	-	126673UA8 Mtge

Source: Bloomberg.

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though the last spin on the roulette wheel gave them information about the next spin. This is never true and the belief that it is always leads to financial ruin if leverage becomes excessive in the system. Sometimes this ruin is restricted to a single household but frequently it has led to financial disasters.

Countrywide was a prime example of an institution that was throwing a very wide and widening net to capture a lion's share of the mortgage origination business in the United States. The following excerpt is from the June 2009 SEC complaint filed against Countrywide Financial CEO Angelo Mozilo, and two other top executives at the firm, David Sambol and Eric Sieracki. The complaint alleges that these executives misled the market by denying that Countrywide was a significant participant in the subprime mortgage market and that the company had avoided the risks of subprime lending. The executives charged, allegedly traded on this misleading information. From our point of view the complaint is interesting because it highlights how insiders were aware of the risk being dispersed to investors all over the world long before these investors realized they were holding illiquid assets for which they had overpaid. Regulators were also caught off-guard and capital was insufficient to support the wave of losses that flowed from subprime mortgages. The excerpt sums up the forces at play in the nonagency mortgage-backed securities market in the years leading up to its collapse in 2007.

In fact, the credit risk that Countrywide was taking was so alarming to Mozilo that he internally issued a series of increasingly dire assessments of various Countrywide loan products and the risks to Countrywide in continuing to offer or hold those loans, while at the same time he, Sambol, and Sieracki continued to make public statements obscuring Countrywide's risk profile and attempting to differentiate it from other lenders. In one internal email, Mozilo referred to a particularly profitable subprime product as "toxic," and in another he stated that the company was "flying blind," and had "no way" to predict the performance of its heralded product, the Pay-Option ARM loan. Mozilo believed that the risk was so high and that the secondary market had so mispriced Pay-Option ARM loans that he repeatedly urged that Countrywide sell its entire portfolio of those loans. Despite their awareness of, and Mozilo's severe concerns about, the increasing risk Countrywide was undertaking, Mozilo, Sambol, and Sieracki hid these risks from the investing public.

SEC Complaint: Angelo Mozilo, David Sambol, and Eric Sieracki, June 4, 2009

There is no doubt that Countrywide, WAMU, and Wachovia and others flooded the market with risky securities that were not priced correctly at origination or by investors who marked these securities to model based on assumptions about future home prices and economic conditions that proved to be wildly off the mark.

Securitization does not kill economies: bad underwriting, unethical behavior, and greed do. Much like a model that outputs insane answers because the data being input are nonsense, the output of the SPVs was doomed because the risk going in was leveraged and the securities being issued to finance the mortgages were leveraged again and then the investors paid too much and set aside too little capital to support their investments.

Subprime borrowers are categorized as such because they cannot qualify for a conventional loan, due either to a poor credit history or insufficient or erratic income. One of the riskiest mortgages underwritten in the years leading up to the crisis was the Pay-Option ARM, a very highly leveraged mortgage instrument. Besides shifting interest rate risk to the borrower, it enables the borrower to choose how fast to amortize the loan principal. By giving the borrower the option to defer part of the interest due and add the deferred amount to the outstanding principal, the leverage of the borrower increases and the loan becomes riskier. Now if the SPV buys a pool of these loans and funds it with senior, subordinate, and residual classes of securities, the subordinate class is leveraged because it is funding a disproportionate amount of the pools credit risk, but this credit risk is not fixed or diminishing over time: rather, it is increasing over time because the pay option ARM mortgage is designed to negatively amortize. Negative amortization occurs when the borrower exercises his option to defer payment of interest and add this interest onto the outstanding principal. This is standard ponzi-scheme financing as defined by Hyman Minsky. The mortgagor is in effect borrowing funds to pay the finance charges on his debt. This option to defer interest is in the money as long as the borrower expects the equity in the home to appreciate faster than the rate the loan balance increases, due to negative amortization.

GSEs AFTER THE FINANCIAL CRISIS

The guarantees of FNMA and Freddie Mac were not government guarantees either before they were placed under conservatorship or after conservatorship.

When the GSEs were placed under the conservatorship of the Federal Housing Finance Agency (FHFA), the U.S. Treasury made a commitment to keeping both GSEs afloat. The U.S. Treasury owns the senior preferred stock

of FNMA and a warrant to purchase 79.9 percent of the company's common stock. While not exactly guaranteeing the obligations of FNMA or Freddie Mac, the U.S. Treasury is more intimately linked now than ever before with these two giant pillars of the secondary mortgage market. FNMA and Freddie exist to channel funds from the global capital and money markets to the retail housing finance market where mortgages are originated. The board of directors of both FNMA and Freddie no longer answer to the shareholders, but instead directly to the conservator. It is the conservator who has the power to appoint and dismiss members of the board of directors. The conservator has delegated day-to-day management responsibilities. No longer does management pursue the goal of maximization of shareholder wealth, but rather its objective is the minimization of losses, as well as keeping FNMA and Freddie solvent while facilitating the flow of capital to financial institutions so that they may originate mortgages. Securitization is still central to both FNMA and Freddie Mac, achieving their goals of being conduits for mortgage capital.

Exhibits 1.16 and 1.17 from the 2011 10-K of FHLMC illustrate the securitization schemes that are used by the company. In general this is how FNMA structures its securitization transactions as well. There are no significant differences between the structures of FNMA and FHLMC securitizations. Exhibit 1.16 depicts the structure of Freddie MAC's "Cash Auction of PCs." The mortgage lender is selling spot or forward mortgage loans to FHLMC in return for cash. FHLMC then auctions the PCs issued by a trust to securities dealers.

The structure in Exhibit 1.17 is known as the "Guarantor Swap" transaction. The cash buy-downs and buy-ups are used to equalize the yields

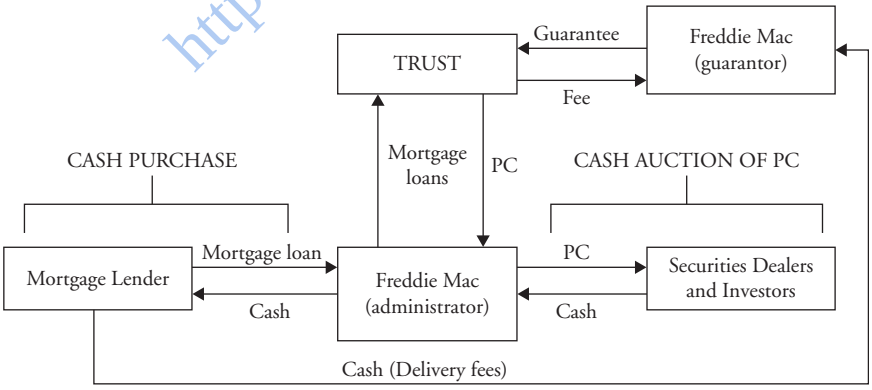

EXHIBIT 1.16 Freddie Mac Cash Auction Structure
Source: Freddie Mac, 10-K 2011.

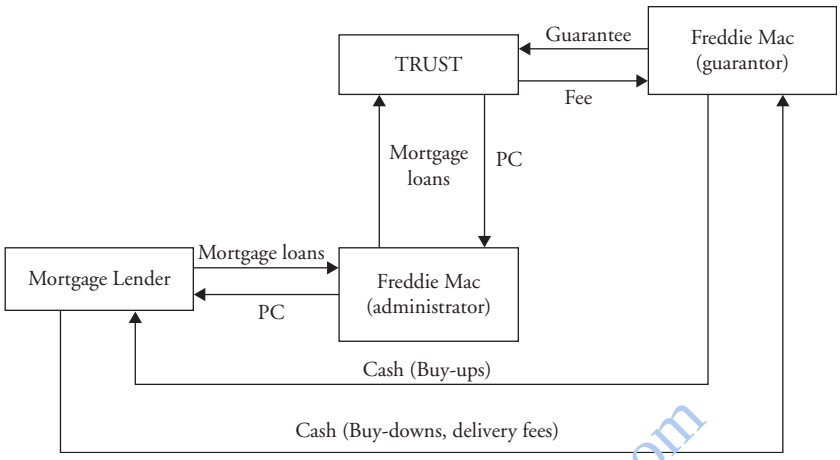

EXHIBIT 1.17 Freddie Mac "Guarantor Swap" Transaction
Source: Freddie Mac, 10-K 2011.

on the securitized mortgages. Freddie Mac offers a "buy-up" for high coupon mortgages and receives a "buy-down" for low coupon mortgages.

The most relevant factor from an investor's point of view is that the credit quality of the MBSs issued by GSE trusts—in this case, trusts administered by FHLMC—is only as good as the guaranty. The quality of this guarantee fell into serious question in the autumn of 2008.

At the time of this writing there is serious consideration by the federal government to wind down both FNMA and FHLMC.

A securitization of a pool of mortgages by one of the GSEs is slightly simpler than a nonagency securitization of assets. In the former, the originator exchanges the mortgage pool with the GSE for MBSs that are issued by a trust sponsored by the GSE. The securities issued by the trust do not include subordinate classes because the GSE takes the credit risk of the mortgage pool by issuing a guarantee. The guarantee is supported by a fund. This fund is maintained by fees charged on the outstanding pool principal. Like the servicing fee, the guarantee fee is a strip of interest in the range of 20 to 25 bp.

FNMA and FHLMC both lowered their standards concerning the mortgage pools they would guarantee and on the MBSs in which they would invest. Managers climbed down the credit ladder to boost the return on equity and serve their public purpose. In the end they did a disservice to the public by inflating the subprime bubble. Financial managers at FNMA and FHLMC mispriced the risks they booked and the risks they guaranteed. Too

much risk on too little capital: same old story. This is what led to the ruin of FNMA and FHLMC. It is not our purpose to analyze the management decisions that led to investments in subprime mortgage-backed securities, but the pressures were political, competitive, and financial. Once the real estate market began to weaken and then began a steep decline in value, the losses on mortgages jumped from the subprime to the Alt-A and then to the prime markets, creating losses on both the investment and guaranty sides of the GSE balance sheets. Losses mounted as asset values declined and defaults caused more calls on the guaranty funds. Capital became so thin that FNMA and Freddie were at risk of not being able to roll their massive amounts of debt. In addition both GSEs were large issuers of short-term credit.

ABCP and SIVs

A financial system that is built upon the premise that bank balance sheets are essentially used to fund assets temporarily until they can be securitized is reliant on a well-functioning money market. Originators use asset-backed commercial paper and bank lines of credit to finance warehouses full of assets that are waiting to be securitized. Credit from both of these sources became scarce in the autumn of 2007. Spreads between 60-day AA-rated asset-backed commercial paper (ABCP) and 60-day nonfinancial CP became extreme and indicated a flow of money out of the former sector of the ABCP market. From a spread of 7 basis points in March of 2007, it widened to 178 bp by December and then to 262 at the peak of the crisis in October of 2008. The spread between AA-ABCP and AA-nonfinancial CP now (May 2011) stands at about 10 bp. Investors could not see into specific funding programs. Investors did know the specifics of the assets these programs were financing. On the chance that the SIV or ABCP was exposed to subprime risk, investors retreated. Investors were not simply running for the exits of one movie due to smoke, but from all movie theaters because of a fear of a defect in the electrical wiring systems of all movie houses. In this metaphor the movie theater is the ABCP program and the electrical system is MBS. The spike in spreads of financial ABCP placed further strain on the originate-to-securitize model that was already caving in due to the lack of investors willing to buy subprime-related assets.

The ABS bubble could not have happened without the very deep and liquid ABCP market. Originators rely upon this market to fund their warehouses of financial assets prior to securitization and to place the short-term tranches of ABS, such as the class AF1 issued in the CWL 2004-15 deal that we have described. The market in ABCP grew to 1.2 trillion by the middle of 2007 and then, by the time Lehman was in ruins, the market had sunk to $400 billion outstanding. Two of the leading financial architecture

firms and risk refineries were out of business by this time. The investment banks Bear Stearns and Lehman had become insolvent and others were close to the precipice. The structures they had built were in tatters. The trade in subprime was over and short-term and long-term capital was parked in low-yielding government securities.

It was the inability of structured investment vehicles (SIVs) in the late summer of 2007 to roll over short-term asset-backed commercial paper to refinance risky MBSs and ABSs that was the leading edge of the collapse of the ABS and MBS markets. The problem was that the AAA ratings of the CDO tranches that the SIVs held as assets were being questioned by the market. The SIVs found themselves holding assets that were no longer priced as AAA. This locked them out of the ABCP market. The following excerpt from the Citigroup 10-Q places the SIV in the context of the financial crisis. It was in December 2007 that sponsors of SIVs had to decide whether to let SIVs go out of business or save them by injecting capital.

Structured Investment Vehicles

Structured Investment Vehicles (SIVs) are SPEs that issue junior notes and senior debt (medium-term notes and short-term commercial paper) to fund the purchase of high quality assets. The junior notes are subject to the "first loss" risk of the SIVs. The SIVs provide a variable return to the junior note investors based on the net spread between the cost to issue the senior debt and the return realized by the high quality assets. The Company acts as investment manager for the SIVs and, prior to December 13, 2007, was not contractually obligated to provide liquidity facilities or guarantees to the SIVs.

In response to the ratings review of the outstanding senior debt of the SIVs for a possible downgrade announced by two ratings agencies and the continued reduction of liquidity in the SIV-related asset-backed commercial paper and medium-term note markets, on December 13, 2007, Citigroup announced its commitment to provide support facilities that would support the SIVs' senior debt ratings. As a result of this commitment, Citigroup became the SIVs' primary beneficiary and began consolidating these entities.

On February 12, 2008, Citigroup finalized the terms of the support facilities, which take the form of a commitment to provide mezzanine capital to the SIVs in the event the market value of their junior notes approaches zero. The facilities rank senior to the junior notes but junior to the commercial paper and medium-term notes. The facilities are on arm's-length terms. Interest will be paid on the drawn amount of the facilities and a commitment fee will be paid on

the unused portion. The termination date of the facilities is January 15, 2011, cancelable at any time at the discretion of the SIVs.

Citigroup, Inc. 10-Q, March 31, 2008

Once subprime assets could no longer be priced in the market and the confidence in bank and rating agency models waned, SPVs could not issue subordinate classes of MBSs and ABSs. Without the ability to leverage credit risk, AAA securities could not be issued by SPVs. This essentially trapped subprime risk on the balance sheets of the originators. Those with deep and diverse balance sheets and who had access to the Fed discount window were able to hang on, while the specialized originate-to-securitize institutions suffocated quickly for lack of capital. Managers had to fund inventory for longer periods and forego profits related to securitization. Bank lines of credit became scarcer. In addition the mortgages they held were defaulting at high rates, lowering income and extinguishing equity. SIVs and CDOs are synthetic financial institutions that rely on the ABS markets for funds. With the money and capital markets closed to these institutions the assets they owned had nowhere to go but down in value as SIVs (variable-interest entities) and hedge funds that owned SIV and CDO liabilities were forced to liquidate assets. Citigroup as investment manager of SIVs decided to take mezzanine positions. While Citigroup's actions kept the SIVs afloat, it also placed Citigroup in the position as the primary beneficiary. The primary beneficiary of a variable-interest entity (VIE), which the SIV was, must consolidate both assets and liabilities of the entity. Exhibit 1.18 illustrates the dramatic decline in the amount of ABCP outstanding. The rapid rise and decline between 2004 and 2007 coincides with the housing bubble. ABCP was greasing the wheels of the subprime securitization machines such as Countrywide.

Exhibit 1.19 is quite important. It shows how the original spike in the cost of ABCP in 2007 was temporarily subdued by Federal Reserve injections of liquidity but could not be permanently controlled. It was not until the spring of 2009 when the banks had been floated with TARP money and the Federal Reserve was actively buying ABCP and ABS that the spreads fell in absolute and relative terms. The scarcity of funds in the money markets, specifically in the market for three-month CP issued by financial institutions, doomed ABS/MBS warehouses.

FROM BALANCE SHEET TO OFF-BALANCE SHEET

Capital flows are conducted through various paths of the financial system by financial institutions committed to the securitization model of finance. Without the option of securitization, banks and financial institutions would

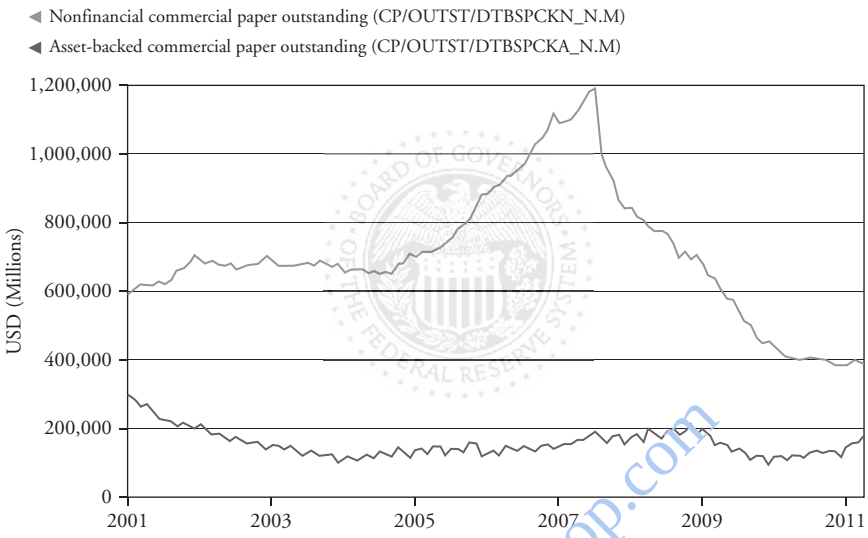

EXHIBIT 1.18 Outstanding Nonfinancial and Asset-backed Commercial Paper
Source: U.S. Flow of Funds, Board of Governors of the Federal Reserve.

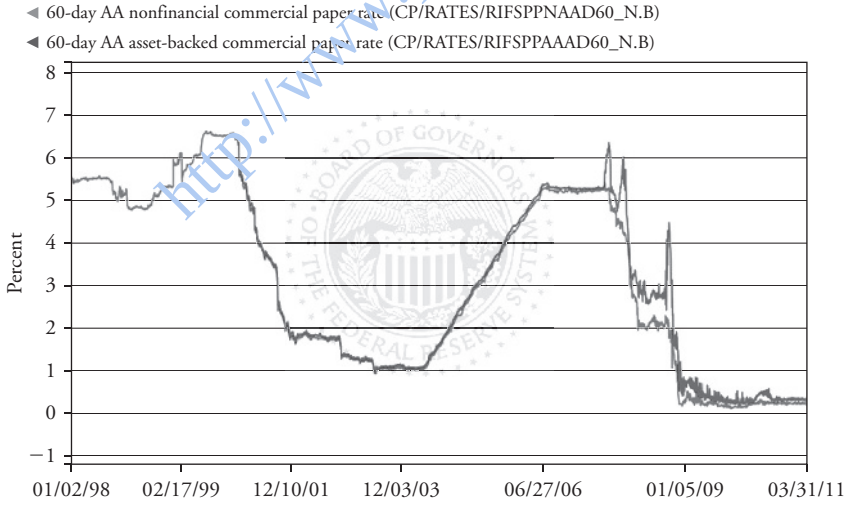

EXHIBIT 1.19 Interest Rate on 60-Day AA Nonfinancial and Asset-Backed Commercial Paper
Source: Board of Governors of the Federal Reserve.

be constrained by the liabilities and equity they could issue from their balance sheets.

Rather than raise funds to finance assets until maturity, whether it is a 3-year auto loan or a 30-year mortgage with an expected life of 12 years, managers plan to pool similar assets and liquidate them in securitization transactions. This makes short-term lines of credit from banks and asset-backed commercial paper conduits critical to sustaining the flow of capital through the balance sheet of the originator to the capital and money markets and back to the balance sheets of the financial institutions (FI). Securitization has transformed banking from one where loans are booked and financed to one where they are treated as financial inventory to be turned over quickly. As with any business that derives value from efficiently managing inventory, like a Wal-Mart or Target, it is imperative that the correct inventory is stocked, that revolving credit is in place and that there are customers for the inventory. In our book the inventory is financial assets such as mortgages, loans secured by automobiles, commercial accounts receivables, and credit card balances. Customers are the investors who buy the MBSs and ABSs. Investors do not buy raw inventory; they buy refined or processed inventory and this process is securitization. Suppliers are the originators who extend the credit to the mortgagors. Interestingly the suppliers of the short-term credit to the originator that manages the warehouse are the same banks that fund soft-goods retailers. When these banks became distressed due to loans to mortgage warehouses, credit became constrained to the real retailers.

Volume and speed are key elements to success as a securitizer. Of course we now have learned what we should have already known. Reaching for speed and volume comes at the expense of underwriting standards and precise paper work. Without accurate information a loan is more likely to be badly underwritten and more susceptible to legal action by both sides of the transaction. An integral part of a mortgage system that is based on a liquid secondary mortgage market is that loans can be transferred, modified, worked out, or properly foreclosed if necessary.

Securitization delinks the capacity of an originator's balance sheet to fund assets from its ability to originate assets. The faster the financial institution can originate and move the assets off-balance sheet the thinner the capital base the originator can work off of. The speed at which assets can be booked and then sold depends on the efficiency of the market for ABSs and MBSs. As we will learn, the market for MBS and ABS must be deep enough to not only fund AAA credits but also credits rated at all points on the credit spectrum. Just as a financial institution must issue a certain amount of equity or secure a guaranty to market its debt, a securitization vehicle must do the same. In the case of the agency market for MBSs,

investors are made whole by FNMA or Freddie Mac when the underlying mortgages default. The GSEs guaranty the timely payment of interest and principal due on the MBS issued by trusts that they sponsor. Investors are left to deal with the interest rate risk, prepayment risk, and liquidity risk associated with the MBSs.

Unlike equity issued by a bank, the equity that a securitization vehicle issues does not give its owners control over the pool of assets. Control is delimited by the pooling and servicing agreement and the trust indenture. Since the role of the SPV is to simply fund the assets, management decisions and control do not really enter the value equation. Loan modifications are executed by the servicer with the constraint that the modification can be justified in terms of benefits that accrue to the certificate owners.

The equity function of a securitization vehicle is performed by residual interests and subordinate classes. These elements of the securitization vehicle's capital structure absorb the first levels of credit losses and act as a buffer between the pool assets and the senior notes issued by the trust.

CMOs, IOs, and POs

In one case the SPV issues what are called pass-through securities because the monthly interest and principal that mortgagors pay to amortize their debt is passed through on a monthly basis to the owners of the MBSs backed by this pool of mortgages. The credit risk is funded by a third-party guarantor, but the interest rate risk and prepayment risk are carried by the investors in the pass-through certificates.

In a second transaction we begin with a similar asset pool but the capital structure of the SPV is different. Rather than simply pass through payments from mortgagors to a single class of investors on a monthly basis, value is added by reallocating cash flows. For example, the capital structure of the SPV might be composed of three sequential classes, an accrual class, and a subordinate class. The securities would be designed to pay investors semiannually rather than monthly. This type of transaction is called a collateralized mortgage obligation or CMO. Classes of securities that mature sequentially enable the SPV to attract investors with varying preferences in terms of duration. The first class in line to mature would appeal to investors looking for relatively short-duration investments. The last in line to be paid down has appeal to investors with a longer-duration horizon. The accrual class is a zero coupon bond with the added complexity that the amount that accrues and the duration for the accrual depend on the rate at which the underlying mortgage pool pays off. While the prepayment option embedded in mortgages is not a result of securitization, this option is the value wedge between MBSs and other fixed income securities. Complexity in finance can

offer opportunity to both sides of the market. A financial engineering team's ability to design and market complex securities means that cash flows and risks can be more effectively distilled and distributed. Structuring securities that distill, reallocate, and broadly distribute risk means that the consequences of mispricing the securities will have broad and exaggerated consequences, and these consequences are compounded when the designed securities are leveraged. With respect to securitization, leverage is created when risk embedded in an asset pool is funded disproportionately by one class of securities. The first CMO that was issued by FHLMC in 1983 had three classes. This was an enormous financial innovation. By reallocating the cash flows from a pool of 30-year fixed-rate mortgages along the maturity dimension, value was added by lowering the yield relative to funding with a single class and offering investors a security that was not previously available.

FHLMC recently issued (REMIC Series Number 3860) a 20 class (very moderate in number of classes) to finance $429,960,000 of Freddie Mac pass-through securities. Increasing the number of classes means that the cash flows of the underlying pool have been more finely distilled and more broadly distributed. A series with over 40 classes is not unusual. Excessive distillation comes at a cost; certain classes become illiquid and more elastic with respect to changes in economic and pool performance variables.

An example of this leveraging would be financing a pool of assets with two classes of securities. One class called the interest only (IO) strip and the other the principal only strip (PO). The IO class has a claim on all interest payments net of servicing and guaranty fees generated by the pool. The PO class has a claim on all of the repayment of principal. An investor who buys both the IO and PO stripped from one pass-through would effectively own the pass-through security again. Separately the two securities offer very different and more sensitive risk profiles with respect to changes in interest rates and prepayment rates than the pass-through. We discuss IO and POs later in the book. Stripping a security into an IO and PO is an example of distilling the cash flows of the original pool of assets to a further degree.

Pass-Through Securities

The most basic transaction in securitization from both the investors' and originators' point of view is the FNMA pass-through or Freddie Mac PC. We will focus on the FNMA pass-through. While the transaction is simple to describe, one should not take for granted the detailed legal contracts that support these transactions. For example the seller and servicer agreements that originators must have knowledge of are in the thousands of

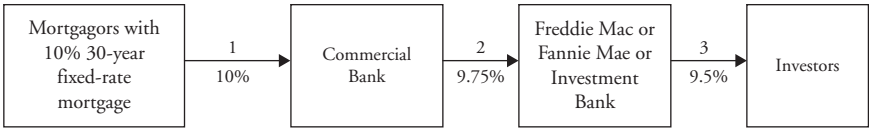

EXHIBIT 1.20 From Mortgage Rate to Pass-Through Rate

pages (*Fannie Mae Single-Family Selling Guide*, 1,249 pages). This guide informs in detail the managers of FIs who are originating mortgages for sale to Fannie Mae for cash or to swap for MBSs, outlining all the constraints of underwriting and delivery processes that must be followed.

In Exhibit 1.20 we show how the coupon on a pool of mortgages is reduced in the securitization pipeline. The reduction in the coupon is not a loss of value because the lower coupon is in return for enhanced liquidity. Arrow 1 corresponds to the fixed payments made by mortgagors to the bank, based on a 10 percent 30-year fixed-rate mortgage. The bank receives the mortgage payments, and even though it sold its mortgages to Freddie Mac (or Fannie Mae or an investment bank), it will retain a servicing fee, typically about .25 percent of the outstanding balance of a mortgage in the previous year. The servicing fee is a compensation for the bank, which is still collecting the mortgage payments, taking care of payment delays, and if necessary foreclosing on the property.

After deducting the servicing fee, the commercial bank passes the 10 percent mortgage payment minus the .25 percent servicing fee to the purchaser of the mortgage (Arrow 2: 9.75 percent remains).

Investors are willing to accept the reduction in coupon because the guaranteed securities are more liquid than a pool of mortgages. Servicing fees are significant sources of income for financial institutions. Guarantee fees collected by FNMA and Freddie Mac proved to be too low relative to the risks they funded between 2006 and 2008.

The Private-Label Market

Private-label MBSs are those that do not benefit from the guarantees of either FNMA, Freddie Mac, or GNMA. These agencies will not extend their guarantee to mortgages due to either the violation of certain underwriting standards and/or because the mortgage loan is in excess of limits that the agencies have set. It was not feasible for financial institutions to compete head-to-head with FNMA and Freddie due to the explicit and implicit sources of credit that the agencies had with the federal government. While

competition among lenders in the private market was responsible for the development of large streamlined mortgage lenders with the ability to efficiently originate, service, and securitize assets, there was little effective government or private oversight constraining the quality of the mortgagors that were able to secure credit or the terms of the loans. Subprime did not have to mean junk . . . but in the end, it did. The inherent weakness in the private market was that competition gave lenders an incentive that increased the supply of credit. Subprime and Alt-A mortgages were a part of, and for that matter a *growing* part of, the private label MBS market. It was the rapid growth of subprime lending and the securitizing of subprime mortgages that laid the foundation for the dramatic collapse in home prices and the financial crisis that ensued.

AGENCY AND NONAGENCY MARKET SEGMENTS COMPARED

Common to both the agency and private-label segments of the MBS market is the fact that mortgages are transformed from illiquid financial assets held by the originator of the loan into liquid, tradable securities that are distributed in the national and international money and capital markets. Although both private-label and agency MBSs compete for the same set of investors, the agencies have certain economic advantages due to their status as GSEs. Agency MBSs are exempt from registration with the SEC, have lower risk weightings than private-label MBSs, and are more liquid. The GSEs have been able to raise capital at better terms than the private-label securitizers. Not being able to compete head-on against the GSEs, competition moved to the margins of the market. Originators designed highly leveraged mortgages such as pay-option ARMs and offered these mortgage loans to people with low FICO (stands for Fair Isaac Corporation) scores and other indications that they were weak credits. A FICO score is an indication of one's ability to repay debt. While there is no exact cutoff between prime and subprime, a FICO below 620 is generally considered to be subprime. A FICO score of 660 is risky and since FICO scores are not stationary and may be a function of future debt issued, one can argue that a 660 FICO is quite likely to end up at 620 and thus is a subprime-in-waiting.

> *We also continue to have significant amounts of mortgage loans in our single-family credit guarantee portfolio with certain characteristics, such as Alt-A, interest-only, option ARMs, loans with original LTV ratios greater than 90%, and loans where borrowers had*

FICO scores less than 620 at the time of origination, that expose us to greater credit risk than do other types of mortgage loans.
(10-K, Federal Home Loan Mortgage Corporation, for the fiscal year ended December 31, 2010)

Alt-A mortgages are underwritten with less information about the borrower's financial position than a GSE would require. The competition for mortgages to fill the expanding securitization pipeline was taking place beyond the limits of the GSEs. Eventually, the GSEs were into the subprime market in a big way. Had the GSEs stayed out of the subprime space the losses sustained by the GSEs would have not been as significant and the capital that was channeled into this market would not have been so amplified.

Credit Risk Considerations

Credit risk in the context of a securitization transaction is the rate at which the underlying assets become delinquent and default. A valuation of MBSs and ABSs depends on the expected default rate on the underlying asset pool and how this default rate translates into losses on the securities issued to finance the pool. Investors are aware that the underlying pool is risky. Risk does not necessarily translate into a yield lower than expected if the risk is evaluated correctly at the outset and is reflected in the price the investors pay for the securities. Of course any measure of risk by definition is uncertain. It is the allocation of credit risk in a securitization transaction to various classes of securities that compose the series that enables the assets to be funded at an average yield that is lower than if the credit risk of the asset pool were simply passed through and shared equally by all classes of securities. It is the reallocation of credit risk, for example, that enabled Ford Motor Credit, a company with a barely investment grade rating in recent years, to compete for capital with Toyota, a company with an AAA rating. This is not to say that an AAA company does not have certain distinct advantages over a lower-rated company in the domain of raising capital, but securitization made the field more level for weaker companies. As we mentioned earlier, the same argument applied to financial institutions with very thin balance sheets. FNMA had the credit rating on its subordinated debt and preferred stock lowered by Standard & Poor's in 2008. FHLMC also experienced downgrades of its subordinate and preferred obligations at the same time. The distress in FNMA and FHLMC was not being openly acknowledged by the rating agencies. Conservatorship along with large capital injections into the GSEs by the U.S. Government diluted the common stock of the two GSEs and prevents

management from paying dividends on outstanding preferred stock. With the capitalization of the GSEs in doubt, the mortgage credit crisis was spreading to the mainstream prime conventional market that keeps mortgage credit flowing. FNMA, an institution that had helped pull the country out of the depths of the Great Depression of the 1930s, was beginning to crumble in 2008.

A glance at the 10-K and 10-Q filings of the GSEs illustrates that management examines the ratings of investments to protect the ratings of their own liabilities. Risk management failed when management teams of the GSEs relied too heavily on the NSRO ratings as guides. It is as if the GPS system that captains had counted on for years began to give false readings. All ships en route would become lost and then wrecked at once. Investors in MBSs and ABSs were the ships and the managers the captains. The managers did not know how to navigate without their GPS/ratings.

The rating agencies are the keepers of the keys to evaluating and grading the credit risk of issuers and debt securities. Investors, for better or for worse, rely on the opinions of rating agencies to determine acceptable and unacceptable investments and to manage their risk profiles. Regulators rely upon the rating agencies in their determination of capital charges on certain classes of ABSs and MBSs within a series. It is because rating agencies made fundamental errors in their analysis that investors all over the world were given the illusion that the MBS and ABS market was of higher quality than it actually was. In addition, the rating agencies are a very large determinant of the credit structure of MBSs and ABSs. This is because the level of credit enhancement that is necessary to reach a specific rating for a chosen percent of the classes issued by the SPV to fund a pool of assets is a decision that the rating agencies make. Credit enhancement proved to be inadequate in many securitization structures, leaving investors with securities that were rated in lower categories than intended. While a credit downgrade of a debt instrument is always a possibility, what happened during the financial crisis was a downgrade of an entire market.

Not all investors have blind faith in the ability of rating agencies to correctly evaluate the risk embedded in asset pools, and none should. NSRO ratings have become standards for regulators, arbitrageurs, traders, and fund managers. Since three NSROs dominate the structured finance market—Moody's, Standard & Poor's, and Fitch—and they all seem to be locked into the same approach and rarely differ in the views of the ratings assigned to the classes of ABSs and MBSs, investors do not have access to various opinions about the credit risks. None of the rating agencies detected the macro risk in the subprime market until it was too late.

Risk-Based Capital Regulations

Financial institutions must be capitalized well enough to satisfy both investors and regulators. The amount of capital an institution must allocate against various financial asset classes such as ABSs and MBSs are governed by risk-based capital regulations, and these regulations rely on ratings assigned by private rating agencies that have satisfied the SEC conditions to receive the designation of a Nationally Recognized Statistical Rating Organization (NRSRO).[7]

> *Unrealized gains and losses on available for sale securities do not impact liquidity or risk-based capital. However, reductions in the credit ratings of these securities would have an impact on the determination of risk-weighted assets which could reduce our regulatory capital ratios. In addition, the amount representing the credit-related portion of OTTI (other-than-temporary-impairments) on available for sale securities would reduce our earnings and regulatory capital ratios.*
>
> **(PNC 10-Q for the quarterly period ended March 31, 2011)**

As we can see from this excerpt from the PNC 10-Q, credit ratings of securities determine risk weights used in calculating regulatory capital. Downgrades of securities mean that the bank will need more capital to support these securities. During the financial crisis, widespread credit downgrades were accompanied by a dramatic increase in the cost of capital for financial institutions.

Commercial banks and savings institutions are constrained by risk-based capital regulations, leverage ratios, and market-risk constraints enforced by the Office of the Comptroller of the Currency (OCC).[8]

The risk-based capital regulations constraining banks that are regulated by the Federal Reserve, the Office of the Comptroller of the Currency, and the Office of Thrift Supervision within the Department of Treasury are derived from the 2004 Basel Capital Accord ("International Convergence of Capital Management and Capital Standards: A Revised Framework"), known commonly as Basel II. The federal banking regulations based on Basel II are Risk-Based Capital Standards: Advanced Capital Adequacy Framework. In general terms Basel II is constructed upon three pillars. Pillar 1 addresses risk-based capital requirement for an institution's credit risk, market risk, and operational risk. Pillar 2 is the supervisory review of capital adequacy, and pillar 3 is to foster market discipline as a constraint through timely and accurate public disclosures. The bank's regulator decides on the amount of capital required to support certain exposures if the regulator believes the amount the bank has computed for this exposure is inadequate.

When a bank securitizes a pool of assets, these assets and the associated risks are transferred. This is what fundamentally distinguishes a secured financing from a securitization. Risk-based capital regulations are concerned with assuring that banks hold capital against any securitization exposures that are retained, such as a credit-enhancing interest-only strip but, just as important, the regulations recognize the transfer of risk in a securitization so that banks can free up capital. This is true for both synthetic securitizations and traditional securitizations. Banks do not have to allocate regulatory capital against securitized assets if the assets have been GAAP (Generally Accepted Accounting Principle) sold to a third party and the embedded risks have been transferred from the originator to a third party. In addition to freeing up regulatory capital the originator cannot be obligated to buy back the asset pool except in the case of a qualified clean-up call. An eligible clean-up call is exercisable by the servicer or originator and cannot be structured as credit enhancement. Clean-up calls are executed to wind-up the securitization transactions. An eligible clean-up call cannot be exercised before the asset pool, or, in the case of a synthetic transaction, 10 percent of the reference portfolio falls to 10 percent of its original principal value. The idea is that assets must be sold such that there is no recourse back to the originator that is linked to the performance of the asset pool. Any interests or exposures in the securitized pool of assets retained by the bank or subsidiaries of the bank must be supported by the appropriate amount of risk-based capital.

For purposes of risk-based capital regulations, each asset owned by a bank or savings institution and each off-balance-sheet commitment is assigned a risk weight. The risk weight is then multiplied by the principal value of the asset or commitment to determine the risk-weighted asset value. It is against the total of their risk-weighted assets that banks and savings institutions must allocate a minimum amount of capital to satisfy risk-based capital regulations. Capital is divided into two tiers (tier 1 and tier 2). The leverage ratio limits the amount of debt a banking institution can employ. The leverage ratio of tier 1 capital relative to total assets must be greater than 3 percent.

The risk-based capital guidelines that constrain the amount of capital financial institutions must allocate against specific asset classes are based on the revised 1988 Basel Accord known as Basel I. The revised guidelines that have been adopted by U.S. federal banking regulators are known as Basel II. Basel II final rules were published in December of 2007 and implementation began in April of 2008. Basel II allows banks to rely on internal modeling, assess risk weights based on the granularity of asset portfolios, and relies on the ratings agency assessments to assign risk weights. Basel III, the latest revision of bank capital adequacy standards, will be phased in starting on January 1, 2013, and will become fully binding on January 1, 2019. The objective of the Basel Accords on capital

adequacy is to assure that at all moments, regulated banks have sufficient capital relative to the risks they are funding. Regulators are on a quest to define capital such that it offers a realistic and measurable cushion from losses to creditors, guarantors, and counterparties. Adequate equity capital should prevent banks from being run down. Regulators struggle to define capital, assign the appropriate risk weights to assets, and set a minimum capital to risk-weighted assets ratio. If creditors believe the regulations are credible, they will be less likely to run from a bank.

For a detailed description of the Basel II capital adequacy rules as they pertain to securitization transactions, see Hugi, Kravitt, and Hitselberger (2008).[9] Our intention is to offer the reader a few examples that will clarify the mechanics of the regulations. Risk-based capital regulations require banks to assign their on- and off-balance sheet exposures to one of the following three categories: wholesale, retail, or securitization. Clearly our interest for the purposes of this book is the third category, securitization. Once an exposure is placed in the securitization category, managers must decide how risk weights will be determined. There are three possible approaches: the ratings-based approach (RBA), the internal assessment approach (IAA), and the supervisory formula approach (SFA). The ratings-based approach relies upon external ratings assigned by an NSRO (nationally recognized statistical rating organization). The internal assessment approach uses internal bank ratings to calculate risk weights to exposures to asset-backed commercial paper programs. In the supervisory formula approach bank data is input into a supervisory formula to calculate risk weights.

The retail and wholesale securitization transactions we cover issue securities that are rated by an NSRO and would be constrained by the RBA. The IAA would be applied for bank exposures to ABCP programs such as liquidity and credit lines. IAA would be used to evaluate unrated exposures to a securitization transaction like Credit Enhancing Interest-Only Strips (CEIOs) or certain subordinate positions in a series. The IAA used by a bank must be consistent with the rating methodology used by NSROs.[10]

We summarize the RBA using a few examples and refer the reader to the regulations. As the cost of regulatory capital changes the relative cost of financing, certain dimensions of a securitization will change. This will alter the flow of MBSs and ABSs as banks decide to buy or sell certain exposures to manage capital, risk, and yields.

A bank that invests in a securitization exposure that is rated by one or more of the NSROs can calculate the risk weight of that asset based on the parameters of the ratings-based approach.

For example, if a bank invests in the most senior tranche (senior exposure) of a MBS or ABS that has been rated AAA and is backed by a

granular pool, the risk weight is 7 percent. If it is not the most senior exposure in the series but is still rated AAA, then the risk weight is 12 percent. This means that for a $100 exposure, the bank would need to allocate capital against $12. The capital allocation is divided between 4 percent tier 1 and 4 percent tier 2 capital. The capital charge is thus (4 percent × 12 percent × $100) + (4 percent × 12 percent × $100). The first component of this statement is tier 1 capital and the second tier 2 capital. The principal difference between tier 1 and tier 2 capital is that tier 1 components are less binding financial obligations than tier 2 components. For example common stock is unambiguously tier 1 capital while subordinate debt can be counted in tier 2 capital. Subordinate debt is much more constraining than common stock: It obligates the bank to make periodic interest payments and a firm date for the repayment of principal. It is not certain that debt can be rolled over. Equity, while more costly, is a long-term source of capital.

Granularity of a securitized pool refers to the number and weight of distinct obligors in the pool. Finer granularity implies that the pool is not concentrated among a few obligors and no single obligor has too high a weight in the overall credit risk of the portfolio. A pool considered "granular" attracts a lower capital charge than a nongranular pool of the same rating and seniority. Granularity is a measure of how much credit risk each asset contributes to the overall securitized pool. Think of a very granular pool as one in which each asset contributes a relatively small amount of credit risk to the overall credit risk of the pool. The minimum number of effective assets that must be in a pool to be considered granular is six. Effective assets are not simply the sum of the assets in a pool but rather the ratio of the sum of "exposure of assets at default" squared to the sum of the square of each "exposure of assets at default." The ratio works out so that more weight is given to the number of assets in a pool than to the assets exposure at default. Five assets with an exposure at default of $1 each adds more granularity than one asset with an exposure at default of $5. For MBSs and ABSs such as credit card balances, automobile loans, student loans, dealer floor plan loans, and trade receivables, granularity is not an issue because the pools are so large and the assets tend to be close in their face values. When a securitization involves only retail assets, the pool is considered granular. Another simplifying rule is to treat MBSs and ABSs for purposes of RBC as granular when the number of assets in the pool exceeds 25.

For example, an A-rated tranche that is not the senior exposure of a granular pool has a risk weight under Basel II of 20 percent. If the pool of assets securitized is nongranular, the risk weight is 35 percent. Further down the credit spectrum the risk weight for a class of an MBS or ABS that is rated BB– would be 650 percent. At this level granularity makes no difference in

the risk weight. At BB− or lower, the principal value of the class is deducted from capital. With a weight of 650 percent, in our example the capital required is 8 percent × 650 percent × $100 = $52. If the rating were BB−, then half of the principal value of the class is deducted from tier 1 capital and half from tier 2 capital. Credit-enhancing interest-only strips (CEIOs), which are very often retained by the sponsor of a securitization, are deducted from regulatory capital. Banks are not permitted to count gains on sale from asset securitizations as regulatory capital. Unless the gains are received by the bank in cash, they must be deducted from tier 1 regulatory capital. This prevents banks' capital from being inflated by illiquid assets that reflect perhaps very transitory and somewhat subjective gains. A gain on sale is typically recorded at the time of the securitization and then written up and down over the course of the securitization as retained interests such as excess servicing rights are periodically revalued.

The risk weights for short-term securitization exposures are lower than for long-term exposures. Again this reflects the lower risk of short-term exposures relative to longer-term exposures. Risk weights for MBSs and ABSs with short-term ratings of A-1 are either 7 percent, 12 percent, or 20 percent, depending on the seniority of the class in the series and the granularity of the pool. The 20 percent risk weight corresponds to the short-term ratings for a security issued to fund a nongranular pool. If the A-1-rated class is the senior exposure issued to fund a granular pool, then the risk weight falls to 7 percent. An A-3-rated short-term MBS or ABS issued that is not in the most senior position, but has been issued to finance a granular pool, would be weighted 75 percent.

Basel III will eventually replace Basel II as the constraint for the capital structures and assets composition of banks. Each new risk-based capital accord will presumably foster a better allocation of capital against the true credit risks a bank assumes.

The implication for the MBS and ABS markets of risk-based capital regulations—which for now are in flux but will eventually be set in the Basel III accords until another revision is warranted due to financial innovation, another crisis, or inadequate capital flows—is that securities with higher risk weights are more costly to finance. While not a new or radical idea, regulations change the flow of capital within and across sectors of the economy. Exhibit 1.21 is a summary of the long-term credit-risk weights that the U.S. banking regulators have adopted to be consistent with the objectives of Basel II.

Mortgage and Funds Flow in the Secondary Market

The general mortgage and fund flows for the agency and nonagency mortgage markets are presented in Exhibits 1.22 and 1.23, respectively. As has

EXHIBIT 1.21 Long-Term Credit-Rating Risk Weights under RBA and IAA

Applicable Rating (illustrative rating example)	Risk Weights for Senior Securitization Exposures Backed by Granular Pools	Risk Weights for Nonsenior Securitization Exposures Backed by Granular Pools	Risk Weights for Securitization Exposures Backed by Nongranular Pools
Highest investment grade (for example, AAA)	7%	12%	20%
Second highest investment grade (for example, AA)	8%	15%	25%
Third-highest investment grade—positive designation (for example, A+)	10%	18%	35%
Third-highest investment grade (for example, A)	12%	20%	
Third-highest investment grade—negative designation (for example, A−)	20%	35%	
Lowest investment grade—positive designation (for example, BBB+)	35%	50%	
Lowest investment grade (for example, BBB)	60%	75%	

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Lowest investment grade—negative designation (for example, BBB−)	100%
One category below investment grade—positive designation (for example, BB+)	250%
One category below investment grade (for example, BB)	425%
One category below investment grade—negative designation (for example, BB−)	650%
More than one category below investment grade	Deduction from tier 1 and tier 2 capital

Source: Basel II Capital Accord Notice of Proposed Rulemaking (NPR) and Supporting Board Documents Draft Basel II NPR—Proposed Regulatory Text—Part V, Risk-Weighted Assets for Securitization Exposures, March 30, 2006.

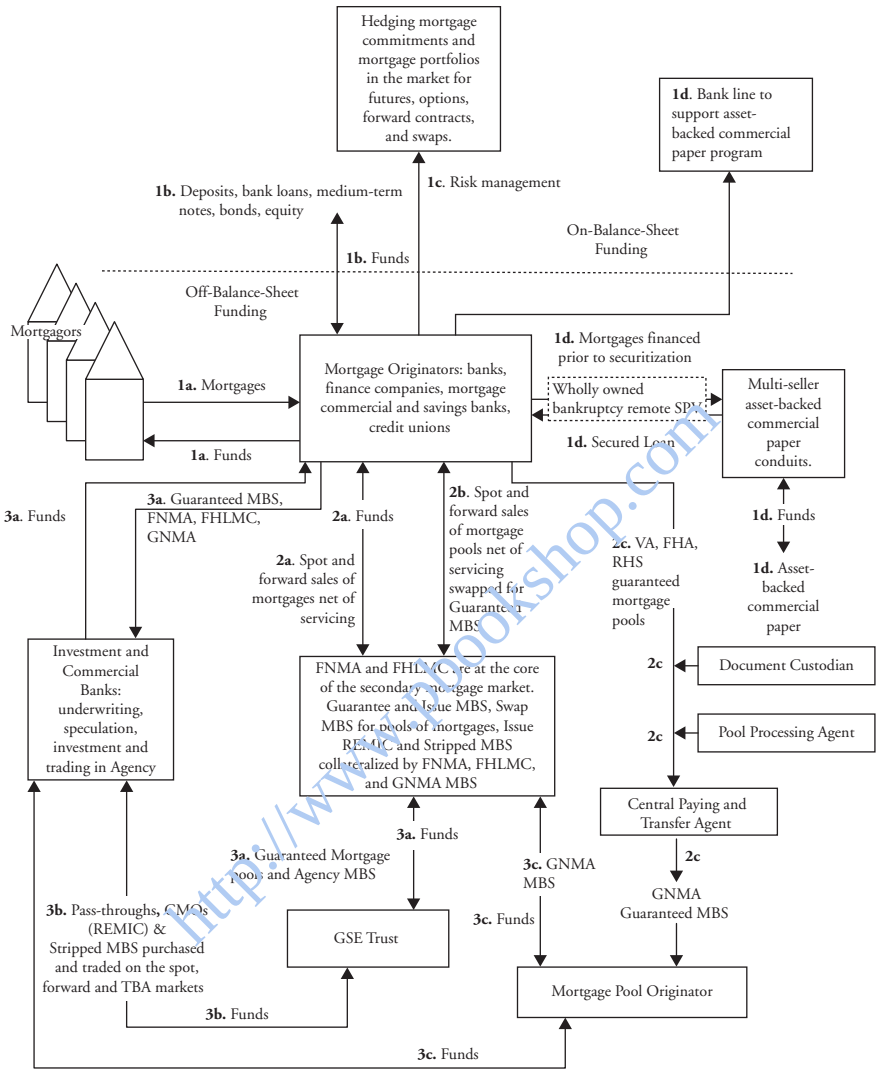

EXHIBIT 1.22 Agency Market for MBSs

already been noted, the nonagency segment of the MBS market is also referred to as the private-label market. For example, when Wells Fargo Home Mortgage Inc. originates mortgages, sells them to a wholly owned subsidiary, and then through a trust securitizes the mortgages, the transaction is a private-label securitization. It is referred to as a private label transaction because the MBSs are not guaranteed by the FNMA, Freddie

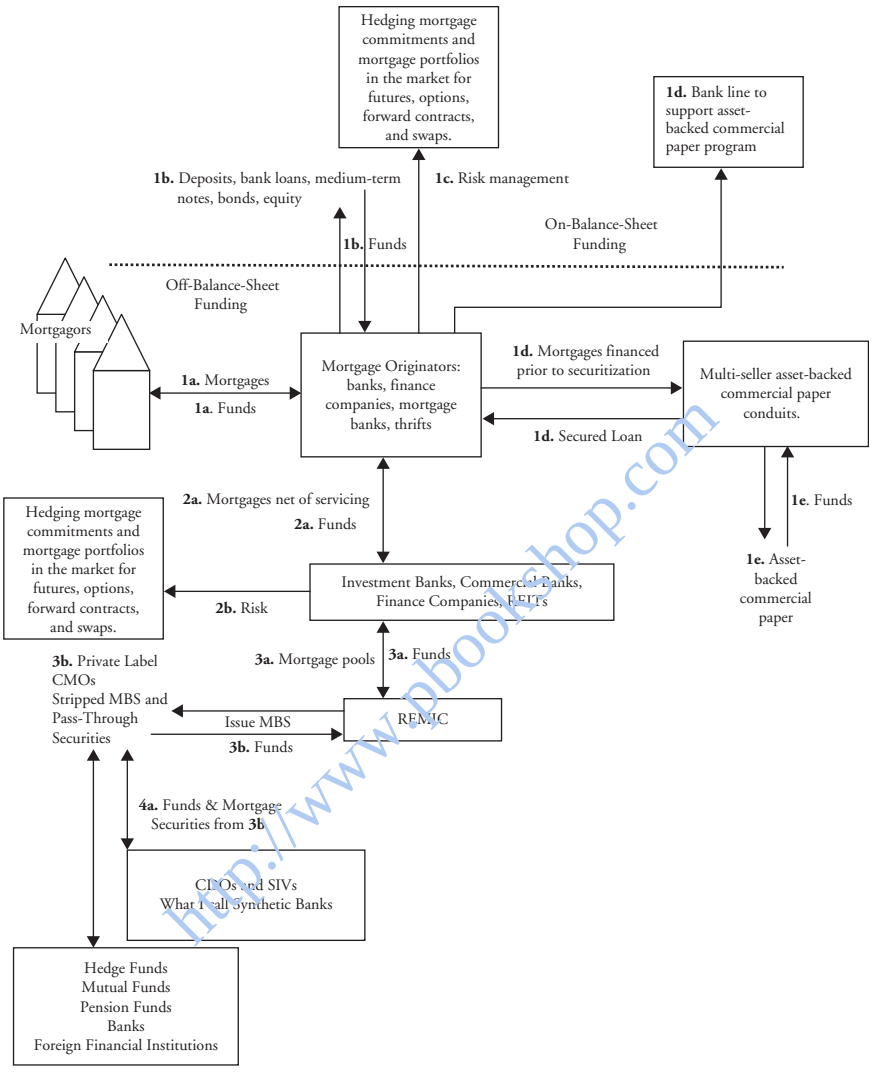

EXHIBIT 1.23 Nonagency Market for MBSs

Mac, or GNMA. Wells Fargo Home Mortgage Inc. taps both the private-label and agency markets for MBSs, it should be noted.

The horizontal dotted line in each exhibit is the separation between on- and off-balance-sheet financing. Mortgage originators have a choice between financing the mortgages they originate and selling them in the secondary market in return for cash or marketable mortgage-backed

securities. Essentially all financial institutions that originate or buy mortgages now rely to some extent on refinancing their mortgage portfolios via the secondary mortgage market. Without the use of the secondary mortgage market the volume of mortgages an institution can originate is constrained by the funding capacity of its balance sheet. Without the use of the secondary mortgage market, financial institutions with a surplus of mortgage capital would be unable to efficiently allocate these funds in mortgage assets. Both the private-label and agency sectors of the secondary mortgage market sever the constraint between origination capacity and financing capacity and give investors in all segments of the money and capital markets access to various dimensions of mortgage assets in the form of securities that can be priced off the Treasury yield curve.

In Exhibit 1.22 the scheme for the agency market for MBSs is presented. Numbers designate the various stages of the process. For transactions that are connected within a stage we use the same modifying letter. If the stage is composed of various disconnected transactions, then the phase number is modified with a different letter. For example, the management of the risk involved with originating and pooling mortgages is associated with the first stage of the market (1), but since risk management is distinct from origination (1a) and funding (1b), the risk-management transaction within stage 1 is labeled (1c). We try to use two-way arrows to save space and to indicate that whenever there is a flow of a mortgage-backed security, there must be an offsetting flow of funds. Fees are extracted at each stage so that in the end the weighted average coupon on the securitized pool will be greater than the weighted average coupon on the security. Fees are compensation for credit enhancement, servicing, trustee services, ratings, and underwriting. We do not show the leakage of fees in the exhibits. On average, securitization adds liquidity to the mortgage market. The fees are part of the cost of creating liquidity. Of course, while on average liquidity is created there are also some very illiquid classes that are created as the distillation goes further and further. Illiquid securities are difficult to value and investors must understand that value can be fleeting.

In the second phase of Exhibit 1.22, mortgages are sold to the agencies (Freddie Mac or FNMA) in the cash or forward markets (2a), pooled and swapped for Agency MBSs (2b), or pooled and securitized through the GNMA guaranty program (2c). A mortgage originator that issues GNMA MBSs will sell the MBSs directly to investors and/or to FNMA, Freddie Mac, and banks that will use the GNMA securities as collateral in CMO issues (3c).

FNMA and Freddie Mac fund a portion of the mortgages and MBSs they acquire on their balance sheets and they securitize a portion. GSE securitizations of pass-through and whole loans are executed through trusts

that elect to be treated as REMICs (3a). FNMA and Freddie Mac REMICs issue MBSs in the spot and the "to be announced" (TBA) markets. The TBA market is for securities that have not yet been created. The securities are issued while the collateral is being accumulated. TBA transactions differ from forward transactions: a forward purchase or sale is for a security that already exists. The TBA market is active and liquid.

At the end of stage 3b, financial intermediaries will own the Agency REMICS, IO/POs, and pass-throughs. These securities are now distributed to investors all over the world. Investors include banks, pension funds, hedge funds, mutual funds, money-market funds, sovereign wealth funds, public authorities, and nonfinancial corporations.

Stage 3c illustrates the distribution of GNMA MBSs, which will end up as end products in investment portfolios or be further refined by investment banks and GSEs into REMICS, IOs, and POs and then distributed. Keep in mind that this is the source of cash that flows to the household. It is important to understand that GNMA guarantees the MBSs; that is, it does not buy the mortgages or issue MBSs, as do FNMA and FHLMC.

Exhibit 1.23 is a depiction of the nonagency market and is divided into three phases. Each phase encompasses multiple flows of mortgage assets and funds. Phase 1 is the origination and funding of mortgages by the mortgagee (the mortgage originator). Homebuyers issue mortgages in return for funds (1a). The mortgage originator must raise the capital to finance the mortgages (1b). Interest-rate risk associated with making forward commitments to mortgagors and funding the mortgages is hedged (1c). In addition to raising funds by issuing deposits, debt, and equity and by taking out bank loans, the mortgage originator may tap an asset-backed commercial paper program to finance the accumulation of mortgages prior to their securitization (1d).

Phase 2 in the exhibit is the sale of mortgages to financial institutions that will securitize the mortgages. In some cases the originator will securitize the mortgages directly. Smaller originators tend to sell their mortgages to larger institutions. The larger financial institutions go directly to the securitization markets. Mortgages are accumulated, funded as inventory, and then sold to the securitization vehicle (2a). For example, Wells Fargo Home Mortgage Inc. originated and bought from other originators $675 million of 30-year fixed-rate residential mortgages that it pooled and sold to its affiliate Wells Fargo Asset Securities Corporation. Wells Fargo Asset Securitization Corporation sold the mortgages to Wells Fargo Mortgage-Backed Securities 2001-4 Trust. The trust financed its purchase of the mortgages by issuing 22 classes of MBSs. Sixteen of the classes were senior (96.25% of the pool) and included a principal-only strip and a residual-interest strip, required because the trust elected to be treated as a REMIC for tax purposes. In this case, the

two sets of arrows tell the story of the route of the mortgages from origination to securitization. Some of the mortgages were originated by Wells Fargo and securitized; others were originated by other institutions according to the underwriting standards of Wells Fargo, sold to Wells Fargo, and then securitized.

Very often, mortgage originators and purchasers of mortgages that are destined for securitization in the private market will use FNMA underwriting standards and analytics. Unfortunately FNMA and FHLMC, rather than raising the standards of the market, began to loosen their standards to compete with the private-label market. This turned a financial disruption into a financial disaster. There are two dimensions to GSE underwriting standards that offered space to the private market. These are the size constraint and the credit quality and documentation constraint. The size constraint limits the mortgage amount that the GSEs will include in guaranteed pass-through securities. Mortgages above this limit are called jumbo mortgages. The size limit is adjusted periodically to keep up with home price values. The quality and documentation constraint limited the mortgages that the GSEs would buy. In other words the GSEs would not buy subprime option adjusted mortgages or no-doc loans. Low quality mortgages did seep onto the GSE balance sheets in the years leading up to the crisis and losses on these assets eventually exhausted their capital.

Investment and commercial banks that buy mortgages and MBSs to use as collateral for CMO issues or interest-only (IO) and principal-only (PO) securities use derivatives markets to hedge their exposure to the risks of the mortgage collateral between the time the bank makes the commitment to purchase the assets and the time the assets are sold to a securitization trust (2b).

Phase 3 in Exhibit 1.23 is the sale of the mortgage pool to the securitization vehicle, which usually elects to be treated as a REMIC. The terms CMO and REMIC are often used interchangeably, but the two vehicles are not synonymous. A CMO is an MBS that reallocates principal and interest payments of underlying mortgages or mortgage pass-through securities across time and credit dimensions. The CMO stands in contrast to the pass-through security that is designed to simply pass cash flows to investors as they are made by borrowers. As has been noted, a CMO is an issue of multiple classes of securities backed by a pool of mortgages or a portfolio of MBSs. Each class of security offers investors a claim on a different tranche of the mortgage collateral's amortizing principal.

A simple example of a three-class CMO is: tranche A has a claim on the first $1 million of principal that the trust receives beginning on January 1, 2012. Tranche B has a claim on the $2 million of principal that flows into the trust after tranche A has been paid off. Tranche C has a claim on

$1 million of mortgage principal but will absorb all credit losses on the underlying principal before class A or B are written down due to defaults on the underlying mortgages. Class C only begins to receive principal after classes A and B have been retired. A tranche may be a zero-coupon security, or the interest rate may be fixed, float with an index, or float inversely to an index. Principal-only and interest-only classes are often issued as tranches of a CMO.

A REMIC, on the other hand, is essentially a creation of the federal tax code. Election of REMIC status is done so that the income of a trust that issues a CMO is not taxed at the issuer level. A REMIC is required to issue a single residual class that bears the burden of financing any tax liabilities of the issuer.

REMICs issue regular classes and must issue one, and only one, residual class. The residual class is designed to absorb all of the federal tax liabilities the trust may incur over its life, whereas the investors in the regular class treat their investments as debt for tax purposes. The REMIC tax rules are quite complex, and expert legal and accounting opinions are needed to evaluate the tax implications of investments in the residual class. Note that a REMIC issues CMOs—a REMIC is not a CMO.

Finally, in phase 4 the MBSs as classes of REMICS are underwritten and distributed to all managers of short- and long-term capital. The idea is to create securities that appeal to a broad, deep, and diversified spectrum of investors. Phase 4 began to break down in 2007 and the U.S. economy suffered from a plumbing problem. MBSs backed up on the balance sheets of investment banks, mortgages backed up on the balance sheets of originators, and the flow of capital to households slowed to a drip. Warehouse financing supplied through asset-backed commercial paper programs also was disrupted in 2007. We write more about how the Federal Reserve stepped into the MBS and ABS markets to keep them functioning.

Industry Illustration

Here is an excerpt of a financial statement from Sovereign Bancorp, the parent of Sovereign Bank, a federally chartered savings institution, which illustrates how mortgage originators use both the private and the agency segments of the secondary mortgage markets to enhance their liquidity and manage risk.

> *As part of its mortgage banking strategy, Sovereign originates fixed-rate residential mortgages. It sells the majority of these loans to FHLMC, FNMA, and private investors. The loans are exchanged for cash or marketable fixed-rate mortgage-backed securities that*

are generally sold. This helps insulate Sovereign from the interest-rate risk associated with these fixed-rate assets. Sovereign uses forward sales, cash sales, and options on mortgage-backed securities as a means of hedging loans in the mortgage pipeline that are originated for sale.

Sovereign Bancorp, 10-K, for fiscal year ended December 31, 2002

PRICING OF NEWLY ORIGINATED MORTGAGES

Typically, banks originate mortgages with the intention of selling them to FNMA, Freddie Mac, investment banks, or other financial institutions. Commercial banks seeking to do so are likely to receive price quotations from several institutions at least once a day.

By way of example, Exhibit 1.24 presents Freddie Mac's description of Gold Cash, one of the mortgage origination programs it makes available to commercial banks.

Freddie Mac Sample Purchase Pricing

Exhibit 1.25 shows sample purchase pricing for 15-year fixed-rate mortgages. For example, Freddie Mac will pay for a 15-year 4.25 percent fixed-rate

EXHIBIT 1.24 Federal Home Loan Mortgage Corporation's Gold Cash Program for Commercial Banks

Gold Cash is **our premier cash execution**, giving you the benefits of a securities execution without the additional considerations of a swap. We base Gold Cash prices on actual securities market conditions, not formulas, so you receive competitive pricing for all your mortgages, including discount mortgages. Our Cash PC volume and our ability to buy mortgages nationwide work to your advantage.

You can sell both premium and discount mortgages when note rates are at or below our posted maximum eligible coupon. There is no par cap when you sell the entire mortgage yield (less your servicing spread) to us.

View live indication pricing, seller-specific pricing, and take out commitments with *Gold Connection for Cash* (GCC), our desktop software. Or, call our Cash Desk at 800-366-2353. Whether you use GCC or the commitment line, your loans can be funded within a few days of delivery.

GOLD CASH PROGRAMS 15-YEAR SFFR INDICATIONS
FOR MORE FREDDIE MAC NEWS, SEE OPTION 16

NOTE RATE	10-DAY	15-DAY	30-DAY	45-DAY	REDUCTION IN PRICE FOR USING: 1ST TUES. REM.	3/8 SERVICING
4.250	95.094	94.895	94.807	94.561	0.150	0.750
4.375	95.844	95.653	95.561	95.323	0.150	0.750
4.500	96.594	96.411	96.313	96.083	0.150	0.750
4.625	97.344	97.168	97.063	96.840	0.150	0.750
4.750	98.094	97.926	97.813	97.598	0.150	0.750
4.875	98.844	98.684	98.563	98.356	0.150	0.750
5.000	99.474	99.320	99.193	98.988	0.100	0.630
5.125	99.974	99.824	99.693	99.484	0.100	0.500
5.250	100.474	100.328	100.193	99.980	0.100	0.500
5.375	100.974	100.832	100.693	100.476	0.100	0.500
5.500	101.437	101.304	101.161	100.946	0.084	0.463
5.625	101.859	101.741	101.595	101.388	0.085	0.422
5.750	102.281	102.179	102.028	101.829	0.085	0.422
5.875	102.703	102.616	102.462	102.270	0.085	0.422

NOTE RATE	10-DAY	15-DAY	30-DAY	45-DAY	REDUCTION IN PRICE FOR USING: 1ST TUES. REM.	3/8 SERVICING
6.000	103.040	102.968	102.808	102.639	0.049	0.337
6.125	103.286	103.225	103.058	102.928	0.049	0.246
6.250	103.532	103.483	103.308	103.217	0.049	0.246
6.375	103.778	103.741	103.558	103.506	0.049	0.246
6.500	104.004	103.969	103.779	103.735	0.041	0.226
6.625	104.207	104.164	103.971	103.911	0.041	0.203
6.750	104.410	104.359	104.162	104.083	0.041	0.203
6.875	104.613	104.555	104.354	104.254	0.040	0.203
7.000	104.850	104.788	104.583	104.473	0.055	0.237
7.125	105.123	105.061	104.863	104.743	0.054	0.273
7.250	105.397	105.334	105.112	105.012	0.055	0.274
7.375	105.670	105.608	105.391	105.282	0.054	0.273
7.500	105.884	105.821	105.599	105.489	0.030	0.214
7.625	106.032	105.970	105.739	105.630	0.029	0.148
7.750	106.181	106.118	105.880	105.771	0.030	0.149

INDICATION PRICES ASSUME 25 BASIS POINTS FOR SERVICING, AND USE OF THE GOLD

EXHIBIT 1.25 Sample Purchase Pricing for 15-Year Fixed-Rate Mortgages

mortgage a price of 95.094 (10-day commitment). This means that for a $100,000 mortgage with a 4.25 percent mortgage rate, Freddie Mac will pay $95,094. It will buy it at a discount because 4.25 percent is below current mortgage market rates. On the other hand, Freddie Mac will buy a 15-year 7.75 percent fixed-rate mortgage at $106,181. Because 7.75 percent is well above current mortgage market rates, Freddie Mac will buy the mortgage at a premium.

The longer the commitment, the lower the price offered by Freddie Mac. The prices take into account the servicing retained by the originating bank.

GOLD CASH PROGRAMS 30-YEAR SFFR INDICATIONS
FOR MORE FREDDIE MAC NEWS, SEE OPTION 16

NOTE RATE	10-DAY	15-DAY	30-DAY	45-DAY	REDUCTION IN PRICE FOR USING: 1ST TUES. REM.	3/8 SERVICING
4.750	93.281	93.234	93.117	92.875	0.085	0.758
4.875	94.039	93.992	93.871	93.633	0.085	0.758
5.000	94.797	94.750	94.625	94.391	0.085	0.758
5.125	95.555	95.504	95.375	95.145	0.085	0.758
5.250	96.313	96.258	96.125	95.898	0.085	0.758
5.375	97.070	97.012	96.875	96.652	0.085	0.757
5.500	97.828	97.766	97.625	97.406	0.085	0.758
5.625	98.488	98.426	98.281	98.066	0.074	0.660
5.750	99.148	99.086	98.938	98.727	0.073	0.660
5.875	99.809	99.746	99.594	99.387	0.074	0.661
6.000	100.469	100.406	100.250	100.047	0.074	0.660
6.125	100.969	100.906	100.742	100.543	0.056	0.500
6.250	101.469	101.406	101.234	101.039	0.056	0.500
6.375	101.969	101.906	101.727	101.535	0.056	0.500

NOTE RATE	10-DAY	15-DAY	30-DAY	45-DAY	REDUCTION IN PRICE FOR USING: 1ST TUES. REM.	3/8 SERVICING
6.500	102.469	102.406	102.219	102.031	0.056	0.500
6.625	102.805	102.742	102.547	102.402	0.038	0.336
6.750	103.141	103.078	102.875	102.773	0.038	0.336
6.875	103.477	103.414	103.203	103.145	0.038	0.336
7.000	103.813	103.750	103.531	103.516	0.038	0.336
7.125	104.094	104.027	103.809	103.777	0.032	0.281
7.250	104.375	104.305	104.086	104.039	0.031	0.281
7.375	104.656	104.582	104.363	104.301	0.031	0.281
7.500	104.938	104.859	104.641	104.563	0.032	0.282
7.625	105.266	105.188	104.961	104.883	0.037	0.328
7.750	105.594	105.516	105.281	105.203	0.037	0.328
7.875	105.922	105.844	105.602	105.523	0.037	0.328
8.000	106.250	106.172	105.922	105.844	0.037	0.328
8.125	106.469	106.391	106.137	106.055	0.025	0.219
8.250	106.688	106.609	106.352	106.266	0.025	0.219

INDICATION PRICES ASSUME 25 BASIS POINTS FOR SERVICING, AND USE OF THE GOLD

EXHIBIT 1.26 Sample Purchase Pricing for 30-Year Fixed-Rate Mortgages

Even though a bank sells its mortgages, it continues to service the loans and therefore retains 25 basis points as compensation per year.

Exhibit 1.27 plots the prices offered by Freddie Mac for 15-year and 30-year fixed-rate mortgages, with a 10-day commitment, over a range of mortgage rates. The top curve is for the 15-year fixed-rate mortgages. Prices offered for 15-year mortgages are always above prices offered for 30-year fixed-rate mortgages. Both curves are steeper in the lower mortgage

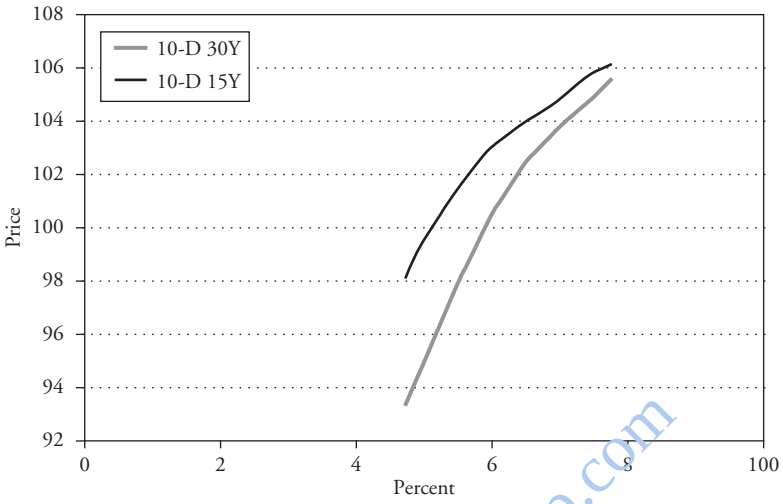

EXHIBIT 1.27 15-Year versus 30-Year Mortgage Pricing for 10-Day Commitment

rate range and flatter in the higher ranges. In the lower mortgage-rate range, the prepayment option is deeper in-the-money than it is in the middle range, and in the higher range the prepayment option goes out-of-the-money. Because the prepayment option falls deeper into the money at a faster rate in the lower range, the prices offered by Freddie Mac or other institutions decrease at an increasing rate in the lower mortgage-rate range.

Mortgage Pricing from the Bank's Perspective

A commercial bank prices its mortgages according to the institution to which it plans to sell them. For instance, a bank selling its mortgages to Freddie Mac has to price its mortgages using (starting from the left side) columns (1) and (2) in Exhibit 1.28 (see also Exhibit 1.26). The bank interested in making 1 percent revenue (R) up front when it originates a 4.75 percent 30-year fixed-rate mortgage has to charge 7.719 points to the mortgagor in order to make up for the discount at which it can sell Sample Purchase Pricing for 15-Year Fixed-Rate Mortgages the mortgage (93.281) and to generate a 1 percent revenue. For the same mortgage rate, the bank interested in generating a 1.5 percent revenue up front will charge the mortgagor 8.219 points.

EXHIBIT 1.28 Mortgage Points: 30-Year Fixed Rate

Note Rate	10-D 30Y	Points 1%	Points 1.5%	Points 2%	Points 2.5%
4.75000%	93.281	7.719	8.219	8.719	9.219
4.87500%	94.039	6.961	7.461	7.961	8.461
5.00000%	94.797	6.203	6.703	7.203	7.703
5.12500%	95.555	5.445	5.945	6.445	6.945
5.25000%	96.313	4.687	5.187	5.687	6.187
5.37500%	97.07	3.93	4.43	4.93	5.43
5.50000%	97.828	3.172	3.672	4.172	4.672
5.62500%	98.488	2.512	3.012	3.512	4.012
5.75000%	99.148	1.852	2.352	2.852	3.352
5.87500%	99.809	1.191	1.691	2.191	2.691
6.00000%	100.469	0.531	1.031	1.531	2.031
6.12500%	100.969	0.031	0.531	1.031	1.531
6.25000%	101.469	−0.469	0.031	0.531	1.031
6.37500%	101.969	−0.969	−0.469	0.031	0.531
6.50000%	102.469	−1.469	−0.969	−0.469	0.031
6.62500%	102.805	−1.805	−1.305	−0.805	−0.305
6.75000%	103.141	−2.141	−1.641	−1.141	−0.641
6.87500%	103.477	−2.477	−1.977	−1.477	−0.977
7.00000%	103.813	−2.813	−2.313	−1.813	−1.313
7.12500%	104.094	−3.094	−2.594	−2.094	−1.594
7.25000%	104.375	−3.375	−2.875	−2.375	−1.875
7.37500%	104.656	−3.656	−3.156	−2.656	−2.156
7.50000%	104.938	−3.938	−3.438	−2.938	−2.438
7.62500%	105.266	−4.266	−3.766	−3.266	−2.766
7.75000%	105.594	−4.594	−4.094	−3.594	−3.094
7.87500%	105.922	−4.922	−4.422	−3.922	−3.422
8.00000%	106.25	−5.25	−4.75	−4.25	−3.75
8.12500%	106.469	−5.469	−4.969	−4.469	−3.969
8.25000%	106.688	−5.688	−5.188	−4.688	−4.188

For a 6.25 percent mortgage rate, the bank can sell the mortgage to Freddie Mac at 101.469 percent. The bank interested in making only a 1 percent revenue at origination will charge 0 points to the mortgagor; to make 1.5 percent revenue, the bank will charge 0.031 points; for 2 percent revenue, 0.531 points; and for 2.5 percent revenue, 1.031 points.

Note that the negative numbers in Exhibit 1.28 should actually be set to 0. A bank will never *pay* points to a mortgagor.

Here is the formula a bank uses to determine how many points to charge a mortgagor for a given mortgage rate. For discounted prices (Price *D*) offered by Freddie Mac or other institutions:

$$\text{Points} = (100 - \text{Price } D) + R \tag{1.1}$$

For premium prices (Price *P*) offered by Freddie Mac or other institutions,

$$\text{if (Price } P - 100) \geq R, \text{ then Points} = 0; \text{ and} \tag{1.2}$$

$$\text{if (Price } P - 100) < R, \text{ then Points} = R - (\text{Price } P - 100) \tag{1.3}$$

The above formulas are used to compute points in the last four columns of Exhibit 1.28.

One should understand, however, that a bank can sell mortgages originated in the past that have remained on its balance sheet. For example, a bank may hold a mortgage with a rate of 8 percent, originated a few years ago. At such a favorable rate, the bank can sell it to Freddie Mac at a premium of 6.25 percent (Price = 106.25 in Exhibit 1.28). In fact, the high premium prices offered by Freddie Mac are not for new mortgages still to be originated, but for outstanding mortgages that have not yet left the bank's balance sheet.

NOTES

1. FNMA and Freddie Mac buy level-pay fixed-rate, variable-rate, and balloon mortgages and create MBSs from them. GNMA guarantees MBSs backed by mortgages that are insured by the Federal Housing Administration (FHA), the Department of Agriculture's department of Rural Housing Service (RHS), the Department of Veterans Affairs (VA), and the Office of Public and Indian Housing (PIH). Both FNMA and Freddie Mac are now under the conservatorship of the U.S. Federal Government.
2. Board of Governors of The Federal Reserve, Flow of Funds Accounts of the United States, September 16, 2011.
3. Federally related mortgage pools include GNMA, FNMA, Freddie Mac, and Farmers Home Administration pools. Also included are federally related pools that are used as collateral for federally related agency-issued CMOs and privately issued CMOs. Federally related mortgage pools exclude Federal Financing Bank holdings of pool securities, which are included with federal government mortgages and other loans and advances. (U.S. Flow of Funds, The Board of Governors of the Federal Reserve.)

4. This information is available in the prospectus supplement, which for public transactions can be found at the SEC, www.sec.gov, in the EDGAR database.
5. Friday, August 29, 2008, 12:22 P.M. EDT. www.reuters.com/article/2008/08/29/idUSWNA147320080829.
6. CWABS Inc., Filed Pursuant Rule 424B (5, Registration File No.: 333-118926, October 25, 2004).
7. Report on Review of Reliance on Credit Ratings as Required by Section 939A(c) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, a Report by the Staff of the U.S. Securities and Exchange Commission, July 2011.
8. On November 29, 2001, the OCC and FRB, FDIC, and OTS published a final rule, "Risk-Based Capital Guidelines: Capital Adequacy Guidelines; Capital Maintenance: Capital Treatment of Recourse, Direct Credit Substitutes, and Residual Interests in Asset Securitizations" (66 FR 59614). The effective date was January 1, 2002. The final rule amended Section 3.4 of Part 3 and Appendix A. It did not amend Appendix B.
9. Robert F. Hugi, Jason H. P. Kravitt, and Carol A. Hitselberger, "U.S. Adoption of Basel II and the Basel II, Securitization Framework," March 2008, 12 N.C. Banking Inst. 45. North Carolina: University of North Carolina School of Law Banking Institute; North Carolina Banking Institute.
10. Part II Department of the Treasury Office of the Comptroller of the Currency 12 CFR Part 3, Federal Reserve System, 12 CFR Parts 208 and 225; Federal Deposit Insurance Corporation, 12 CFR Part 325, Department of the Treasury Office of Thrift Supervision, 12 CFR Parts 559, 560, 563, and 567 Risk-Based Capital Standards: Advanced Capital Adequacy Framework—Basel II; Final Rule.